



**Forest Carbon Partnership Facility (FCPF)
Carbon Fund**

ER Monitoring Report (ER-MR)

ER Program Name and Country:	Emission Reduction Program of Chile
Reporting Period covered in this report:	01-01-2024 to 31-12-2024
Number of FCPF ERs:	4,614,848
Quantity of ERs allocated to the Uncertainty Buffer:	1,357,307
Quantity of ERs allocated to the Pooled Reversal Buffer:	3,076,564
Number of FCPF ERs from enhanced Removals through afforestation/reforestation (A/R)	0
Date of Submission:	24-09-2026
Version	1

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LIST OF ACRONYMS

AA: Accounting Area
AFOLU: Agriculture, Forestry and Other Land Use
AGCID: Agency for International Development Cooperation
ASP: Protected Wildlife Areas
BSP: Benefit Sharing Plan
CATS: Carbon Assets Tracking System
CONADI: National Indigenous Development Corporation
CONAF: National Forestry Corporation
CORECC: Regional Climate Change Committees
COSOC: CONAF Civil Society Council
CORFO: Production Development Corporation
CSGE: Centre for Seeds, Genetics and Entomology
CTICC: Interministerial Technical Committee on Climate Change
CTRCC: MINAGRI's Regional Technical Committee on Climate Change
DBOCC: Climate Change and Forest Departments
DCCSE: Climate Change and Ecosystem Services Department
DM: Monitoring Department
ENCCRV: National Strategy on Climate Change and Vegetation Resources
ERPA: Emissions Reduction Program Agreement
ERPD: Emissions Reduction Program Document
ERP: Emissions Reduction Program
ESMP: Environmental and Social Management Plan
FAO: Food and Agriculture Organization
FCBN: Native Forest Conservation, Recovery and Sustainable Management Fund
FIBN: Native Forest Research Fund
FCPF: Forest Carbon Partnership Facility
FGRM: Feedback and Grievance Redress Mechanism
FIA: Foundation for Agricultural Innovation
FMT: Fund Management Team
FPA: Environmental Protection Fund
FPIC: Free Prior and Informed Consent
FREL/FRL: Forest Reference Emission Level/ Forest Reference Level
GASP: Protected Wilderness Areas Management
GBCC: Forest and Climate Change Management
GEF MST: GEF/Sustainable Land Management Project (MST)
GEF: Environmental Evaluation and Oversight Management
GEPRIF: Forest Fire Protection Management
GCF: Green Climate Fund
GHG: Greenhouse gases
ICP: Private conservation initiatives
IFN: National Forest Inventory
INFOR: National Forestry Institute
INGEI: National Greenhouse Gas Inventory
IPCC: Intergovernmental Panel on Climate Change
LEMU: Logging and Extraction Monitoring Unit
MGAS: Environmental and Social Management Framework
MINAGRI: Ministry of Agriculture
MINENERGIA: Ministry of Energy
MMA: Ministry of the Environment
MOFIM: Intercultural Mapuche Forestry Model

MRS: Mechanisms for Complaints and Suggestions
MRV: Monitoring, reporting and verification
NDC: National Determined Contribution
NDVI: Normalized difference vegetation index
NFMS: National Forest Monitoring System
ODEPA: Office of Agricultural Studies and Policies
OIRS: Information, Complaints and Suggestions Office
PBR: Results-Based Payment
PMST: Sustainable Land Management Project
PNRP: National Landscape Scale Restoration Plan
PTR: Regional Technical Proposal
RCA: Environmental Qualification Resolutions
SAFF: Forestry Administration and Control System
SAG: Livestock Agricultural Service
SAIS: Secretariat of Indigenous and Social Affairs
SAQ: Burn Assistance System
SAT: Early Warning System
SBAP: Biodiversity and Protected Areas Service
SEA: Environmental Assessment Service
SEGEOB: Ministry General Secretariat of Government
SEIA: Environmental Impact Assessment System
SERNAFOR: National Forestry Service
SESA: Strategic Environmental and Social Assessment
SIAC: Public Environmental Information System
SIDCO: Digital Information System for Operations Control
SIGEFOR: Forestry Promotion and Development Management System
SIGI: Institutional Management Information System
SIS: Safeguards Information System
SIT: Territorial Information System
SMM: Monitoring and Measurement System
SNASPE: National System of State-Protected Wildlife Areas
SNiChile: Chilean National Greenhouse Gases Inventory System
TNC: The Nature Conservancy
UACh: Universidad Austral de Chile
UCCSA: Unit of Climate Change and Environmental Services
UNCCD: United Nations Convention to Combat Desertification
UNFCCC: United Nations Framework Convention on Climate Change (CMNUCC in Spanish)
UN-REDD: United Nation Reducing Emissions from Deforestation and forest Degradation
UTRE: Specialized Regional Technical Units

1 IMPLEMENTATION AND OPERATION OF THE ER PROGRAM DURING THE REPORTING PERIOD

1.1 Implementation status of the ER Program and changes compared to the ER-PD

The Chilean Emissions Reduction Program (ERP) comprises the activities implemented as part of the [National Strategy on Climate Change and Vegetation Resources \(ENCCRV\)](#). The ENCCRV is a public policy instrument whose objective is to "Reduce the social, environmental and economic vulnerability generated by Climate Change, Desertification, Land Degradation and Drought on vegetation resources and human communities that depend on them, in order to increase the resilience of ecosystems and contribute to mitigating climate change by promoting the reduction and capture of greenhouse gas emissions in Chile".

To achieve this objective, [seven direct action measures and 19 facilitation measures](#) were defined through technical analyses and participatory processes conducted nationwide. These measures are articulated and strengthened through the different programs, plans and activities carried out by the National Forestry Corporation (CONAF), with technical and financial support from [international climate initiatives](#) (FCPF, Green Climate Fund, [UN-REDD](#), [GEF MST Project](#), [Swiss Cooperation](#), and the [Chile-Mexico Fund](#), among others). This chapter summarizes the main progress in ERP actions and interventions during the 2024 period.

The selected Reporting covers 01-01-2024 to 31-12-2024. The accounting area is 16,601,656 ha¹, related to the total surface of the Maule-Los Lagos administrative regions. This fourth monitoring report for Chile records 9,048,719 emissions reductions (ERs) for the year 2024. These results are mainly due to activities under REDD+ that focus on reducing emissions from deforestation and the reduction in substitution of native forests with forest plantations.

1.1.1 *Progress on Chile's ER Program actions and interventions*

During 2024, the Emissions Reduction Program (ERP) implemented a range of activities under the leadership of the National Forestry Corporation (CONAF). These actions were financed both by public funding and by financial resources from multilateral organizations, which were directly administered by CONAF. This combination enabled the program to deliver targeted interventions and progress toward its climate and environmental objectives.

In the previous reporting period, ENCCRV achieved its first payment for results, facilitated by the +Bosques project funded by the Green Climate Fund. This milestone included the execution of demonstrative pilot projects in 2020, laying the groundwork for future initiatives. Building on this experience, the results of the second round of the ENCCRV Public Tender were published in January 2024. This process was conducted through the implementation of the Benefit Sharing Plan (BSP), ensuring efficient allocation and management of resources to continue advancing the program's goals.

The Benefit Sharing Plan (BSP) is designed to ensure that activities are implemented in a fair, effective and transparent manner. By 2024, a total of 464 projects had been supported through the BSP, covering a combined implementation area of 6,996 hectares and contributing to equitable distribution of resources across the territory. This data refers to number of projects and beneficiaries that apply to Public Tender in 2023 and was adjudicated in 2024, in a surface of 7,637 ha.

This supported portfolio includes afforestation, restoration, sustainable management, post-forest fire restoration and fire prevention forestry. In this call, a total of 1,718 beneficiaries were registered, where 48% corresponded to

¹ Accounting area land use & land use change maps: <https://plataforma.enccrv.cl/static/erpa/mr4/mapas/CUT-MR4.zip>

women and 34% to people belonging to indigenous peoples. In addition, the ENCCRV education program trained 1,578 beneficiaries².

In 2024, in the third call of the ENCCRV Public Tender, 433 initiatives were presented, which completed their award process in January 2025³.

Activities executed with national budget

The following section summarizes the results of the ERP activities carried out by CONAF in the reporting period (2024) in the accounting area (AA). These activities are related to the ENCCRV and aim to address the causes of deforestation, forest degradation and the non-increase of forest carbon stocks.

Under [Law No. 20,283](#), on Native Forest and Forestry Development, administered by CONAF, 990 projects equivalent to 12,595.01 ha of sustainable management were awarded and 100% of the budget allocated by the Native Forest Conservation, Recovery and Sustainable Management Fund (FCBN) was executed⁴. Regarding the Native Forest Research Fund (FIBN), in its eighth call (2024), 13 projects were awarded, executing 100% of the annual budget was executed⁵.

Regarding forest enforcement, 4,813 inspection activities were carried out, covering a total of 48,750 hectares. For the environmental inspection program and subprogram of Environmental Qualification Resolutions (RCA)⁶, 36 scheduled environmental inspections were conducted in 2024.

In 2024, the CONAF Prosecutor's Office provided advice to the Executive Directorate of the Corporation to continue work on the bill that aims to transform the National Forestry Corporation into National Forest Service, based on the reactivation of the process that had begun in 2017⁷. On April 16, 2025, the Senate unanimously approved the new National Forestry Service (Sernapor), the legal successor to the National Forestry Corporation⁸.

The Large-Scale Native Forest Restoration Plan – “Siembra por Chile” was implemented from Arica and Parinacota to Magallanes. The Plan prioritizes the recovery of native forests, conservation and protection of soils, wetlands, headwaters of watersheds and bodies of water, where the landscape scale restoration approach was incorporated in the design of the initiatives. The program executed an area of 9,196 ha and generated 21,097 jobs nationwide⁹.

The National Landscape Scale Restoration Plan (PNRP) is a joint initiative of the Ministries of Agriculture and Environment (MMA), supported by CONAF as technical secretariat. It aims to initiate the restoration process of one million hectares by 2030, considering terrestrial, inland water and marine-coastal ecosystems, prioritizing social,

² SDB Sed., page 74: <https://www.enccrv.cl/5ta-edicion-sdb>

³ Annual Implementation Report 2024-2025, page 21: <https://www.enccrv.cl/reporte-anual-implementacion>

⁴ Public Account document CONAF 2024, page 40: https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

⁵ Public Account document CONAF 2024, page 44: https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

⁶ It considers native forest management, preventive and sanitary, afforestation, and recovery of forests affected by forest fires or climate change, prioritizing the recovery of native forests, the conversion of exotic plantations to native ones, afforestation with native species in conservation and protection zones for soils, wetlands, headwaters, and water bodies, where the landscape-scale restoration approach was incorporated into the design of the initiatives.

⁷ Senate resumes discussion of the bill that will create Sernapor. <https://www.conafprevencionincendios.cl/senado-retoma-discusion-del-proyecto-de-ley-que-crea-el-sernapor/#:~:text=Cabe%20se%C3%B1alar%20que%2C%20durante%20el%20lanzamiento%20del,en%20un%20servicio%20p%C3%BAblico.%2011%20marzo%2C%202024.>

⁸ A strengthened Sernapor is born: “Today is the first day of the next 50 years to project the sector”. <https://www.conaf.cl/nace-un-fortalecido-sernapor-hoy-es-el-primer-dia-de-los-proximos-50-anos-para-proyectar-al-sector/>

⁹ Public Account document CONAF 2023, page 23-24: https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

economic and environmental vulnerability in the country, to recover the ecological functionality of landscapes and thus improve people's quality of life.

In 2024, the [GEF Landscape Restoration Project](#)¹⁰ continued. This project, executed by the Ministry of Environment (MMA) in collaboration with CONAF, and implemented by the Food and Agriculture Organization of the United Nations (FAO), with funding from the Global Environment Facility (GEF), aims to counteract the effects of environmental degradation and climate change through new governance and concrete actions in seven selected pilot landscapes across six regions, promoting practices based on Nature-based Solutions.

The Economic Reactivation Plan for the Restoration of Native Forests on a Large “Siembra por Chile” executes activities from Arica and Parinacota to Magallanes. It focused in initiating restoration processes, prioritizing areas of conservation and protection of soils, wetlands, headwaters of basins and bodies of water. The main actions included:

- Seed Collection National Program: its purpose is to collect seeds in all regions of the country to supply, in the first place, the needs of CONAF's regional nurseries. The surplus of representative samples will be sent to the Centre for Seeds, Genetics and Entomology (CSGE) for processing, analysis, storage, sale or reshipment to places of origin. In 2024, the total volume of seeds entered into the CSGE corresponded to a gross amount of 5,707kg, of which a total of 1,347 kg of seeds cleaned and processed at the center were obtained. Of these, 565 kg were planted in the CSGE nursery. The rest was stored in a cold room. Seed transfers were made to the regional offices of Aysén, Los Ríos, La Araucanía, Coquimbo and O'Higgins, which totaled 30 kg, enabling supply for different programs of the Corporation. Finally, it should be mentioned the execution of seed sales to - small and medium-sized private companies, in the regions of Ñuble, Biobío, Maule, Metropolitana and Tarapacá, for a total amount of 1,347 kg of clean seeds¹¹.
- Activities were also implemented to initiate in situ restoration processes and the strengthening of CONAF nurseries and community nurseries¹².
- In 2024, The Economic Reactivation Plan for the National Landscape Scale Restoration Plan “Siembra por Chile” had a budget of \$9,868,612,000 million Chilean pesos, directly benefiting 2,863 small and medium-sized owners, and also generated 21,097 jobs, through the execution of 9,530 ha in the country¹³.

Activities funded by international agencies.

Specifically, in the 2024 period, the most relevant milestones are related to the following elements:

- Implementation of the 4th edition of the Benefit Sharing System (BSP) for the ENCCRV and the Operational Manual for the implementation of the BSP in the specific framework for the ERP, through the ENCCRV Public Tender.
- Professional development workshops for CONAF personnel on topics such as: ENCCRV platform and the different systems that converge there. Courses on climate change and protected wilderness areas for park rangers and CONAF officials continue to be offered. These self-paced courses trained 120 people in 2024.
- As part of the sustainability strategy of the +Bosques Project, training activities were carried out between the Maule and Los Lagos regions, which are key to ensuring the permanence of sustainable practices among the beneficiaries, where a total of 150 people were trained.

¹⁰ Maisa Rojas, Minister of the Environment: “The GEF Landscape Restoration Project is an urgent response to the need to recover biodiversity”. <https://www.paiscircular.cl/biodiversidad/maisa-rojas-ministra-del-medio-ambiente-y-el-proyecto-gef-restauracion-de-paisajes-es-una-respuesta-urgente-a-la-necesidad-de-recuperar-la-biodiversidad/>

¹¹ Public Account document CONAF 2023, page 21:
https://www.conaf.cl/wp-content/uploads/2024/05/cuenta_publica_2023_2024-5-28.pdf

¹² Public Account document CONAF 2024, page 28:
https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

¹³ Public Account document CONAF 2024, page 23:
https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

- A new National Forest Reference Level was established for the regions from Coquimbo to Magallanes. Its objective was to improve the estimation of carbon emissions and sequestration by forest ecosystems and increase the accuracy of REDD+ results. It also sought to expand its coverage by incorporating six new regions, increasing forest monitoring coverage from 40% to 99.3% of native forest lands. This will allow the country to access new sources of climate finance, enabling CONAF to develop new projects aimed at improving the quantity and quality of forests.
This new reference level was presented to the UNFCCC in December 2023¹⁴ and validated and approved by its panel of experts during the first half of 2024¹⁵. In this context, CONAF carried out two outreach activities regarding the updated and expanded reference levels:
 - A virtual launch of the updated reference level, which was attended by 97 people from the private, academic, and institutional sectors.
 - Technical session for CONAF officials from all regions covered by the new reference level, which was attended by 58 people.
- In 2024, the milestone of the Emissions Reduction Program corresponding to the 2020-2021 monitoring period was validated and verified, demonstrating the committed emissions reductions. As a result, Chile finalized its investment and received payment to CONAF (National Forestry Corporation) for the results achieved. The country received its first payment of US\$5 million for the emissions reductions demonstrated by CONAF, using the approved methodologies. These funds were used to implement afforestation, restoration, forest management, preventative silviculture, and production linkages between the Maule and Los Lagos regions.
- In 2024, a second Technical Annex of Results ¹⁶ was submitted and is currently under review by the Technical Assessment of the Technical Annexes for REDD+ Results (TATR), includes the monitoring periods 2018–2019 and 2020–2021 for the same regions monitored in the new reference level.

Other technical advancements

- Progress in safeguards: during the reporting period, there has been progress related to the implementation and update of the [Safeguards Information System \(SIS\)](#). To achieve this, risks, preventive measures, and verification methods were reconceptualized, adapting them to the multi-scale approach of the projects and optimizing the user experience. Coordination with CONAF's Information, Complaints and Suggestions Office (OIRS) continued to be strengthened through the inclusion and improvement of the procedure associated with the ERP's [Complaints and Suggestions Mechanisms \(MRS\)](#). The main advancement regarding the Environmental and Social Management Framework (MGAS) was the development of its comprehensive update, responding to new national circumstances, the formalization of the gender approach, and the need for adaptive management focused on continuous improvement, with publication scheduled for 2025. Finally, a National Safeguards Approach Proposal for the ENCCRV has been reinforced by the DCCSE safeguards specialists, in line with the commitments made by the country within the framework of the ENCCRV.
- Prior to the start of the third version of the Public Tender, improvements were made to the platform to make it more user-friendly and comprehensive, so that it can be used by both applicants and professionals who handle applications, whose objective is to contain and monitor the application processes of REDD+ initiatives until completing their final award phase; such as the entry of applicant data, the design, evaluation of the initiatives and their admissibility.
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¹⁶ https://unfccc.int/sites/default/files/resource/CHL_REDD_2024.pdf

1.1.2 **Strategy Update to mitigate/and or minimize potential displacements**

The ERPD 2016 document from Chile argued that the most important way for ENCCRV to avoid emission displacements would be to implement action measures at the national level. Under this approach, the likelihood of displacement becomes significantly lower. This way remains the most relevant in the ER Program reporting period, as ENCCRV actions are effectively being implemented across all regions of Chile and not just those in the AA. Nevertheless, the ERPD mentioned possible local displacements could occur inside the AA, for which measures associated with some of the main drivers identified were proposed.

In 2018, the [document](#) “Additional background for the update of the Chilean ER Program, according to recommendations by the Chair's Summary in the 15th Meeting of the Carbon Fund”, does not refer to any changes in the strategy for mitigating and/or minimizing these possible displacements. If that is so, the strategy used to mitigate displacements inside the AA remains as such, i.e., through measures designed for some of the main causes or drivers associated to forest degradation and deforestation, which have been updated as such for the period of this report:

DD cause/driver	ERPD proposed strategy to reduce displacement risks (2016)	Strategy update for report period (2024)¹⁷
Unsustainable use of vegetation resources.	Following the forestry management actions proposed by the ENCCRV to address this issue, there is a risk of emission displacement due to the reduction of the potential harvesting volume by forest owners in accordance with planning criteria. The strategy proposed to reduce or avoid such displacements consists of increasing sale prices under a higher valuation for sustainably sources wood. In this way, forest owners can extract less wood without impacting their revenue. This is achieved through improved productive chains, moving forward in the sustainable firewood and wood certification process for obtaining better prices. Furthermore, the ENCCRV will seek to reduce production costs for owners through tax reductions and improved monitoring to promote sustainable forest management.	The 2024 public call supports sustainable forest management and the income of forest owners by improving the value chain and reducing operating costs. This is achieved through infrastructure funding, such as solar dryers and collection centers, which allow for optimal moisture standards, increasing the sale value of firewood and promoting formalization in the biofuels market through the use of processing plants and portable sawmills. To offset potential reductions in harvesting volume, the call covers critical costs by funding technical assistance for project formulation and monitoring, along with the development of management plans based on sustainability criteria. Additionally, the program directly finances silvicultural activities such as pruning, thinning, and release cutting, which improve the future quality of the forest without requiring a direct investment from the landowner's assets.
Forest fires	With the fire prevention actions proposed by ENCCRV to address this driver, such as preventive silviculture, there is a risk of emissions displacement by promoting forest biomass extraction actions (Fire and fuel gaps). The strategy proposed to avoid and reduce such emissions entails, on one hand, detailed planning of each activity to identify the best way to remove	To mitigate the risk of emissions displacement associated with biomass extraction, the 2024 call incorporates a strategy focused on efficient management and valorization of forest residues. Through the Preventive Silviculture Program, critical interventions such as firebreaks and fuel reduction treatments are financed.

¹⁷ All the actions mentioned here, which were carried out during the 2024 period, are described in CONAF's public accounts documents, available at: https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

DD cause/driver	ERPD proposed strategy to reduce displacement risks (2016)	Strategy update for report period (2024) ¹⁷
	a minimum amount of biomass with the greatest impact on fire risk reduction, and on the other, using the extracted biomass in wood – based products that fix carbon in longer terms.	To ensure that extracted material does not become a source of emissions through burning or decomposition, activities related to Biomass Management and Utilization are subsidized, including the sorting, extraction, and chipping of residues. This biomass is then linked to the Dendroenergy Strengthening Program, which increases the sustainable supply of solid biofuels (firewood, wood chips, and charcoal) through drying infrastructure that enhances their energy efficiency. The entire process is supported by Specialized Professional Advisory services, whereby CONAF technical staff provide guidance in project formulation and management to ensure technical and environmental feasibility, as well as compliance with safeguards.
Forest being used for livestock farming	Establishing buffer zones for livestock farming in forest areas is one of the measures proposed by the ENCCRV for addressing this driver. There is a risk of this measure generating emissions displacement, as cattle will have to be moved to other grazing areas and cause degradation. The strategy for reducing such risk is based on supporting the development of global livestock management plans, leading to a more efficient use of plains, forest grazing systems and summer grazing management.	The public call in 2024 directly funded livestock exclusion and protection measures through the installation of perimeter fencing. These measures are integrated into a project design that promotes comprehensive land management, whereby silvicultural practices are tailored to ensure forest persistence. This design is based on an on-site socio-environmental assessment, where technical assistance professionals identify risks and ensure compliance with the safeguards of the ENCCRV Environmental and Social Management Framework, guaranteeing that the projects do not generate emissions displacement within the territory. Consequently, it can be stated that this strategy is current and active for this displacement risk, which is considered medium. The possibility of reinforcing these actions through training in other regions will be evaluated.
Agriculture and livestock expansion	In order to mitigate the potential of deforestation emissions due to this driver to transition towards forest degradation, the proposal is to promote the conservation of native forests with financial support through the incorporation of forest conservation variables in Law No. 18,450 on irrigation promotion and Law No. 20,412 on sustainability of agricultural lands. Then, farmers and livestock owners will have another	There have been no developments in the incorporation of forest conservation variables to Laws No. 18,450 and 20,412; therefore, this strategy is neither current nor active. The viability of achieving such regulatory adjustments during the period of the Emission Reduction Payment Agreement (ERPA) is being evaluated. Failing this, a new

DD cause/driver	ERPD proposed strategy to reduce displacement risks (2016)	Strategy update for report period (2024) ¹⁷
	sustainable source of revenue to compensate for the potential loss of their previous livelihood if changes to forest conversion promotion by means of Laws No. 18,450 and 20,412 were to deter them from expanding their agriculture lands over natural vegetation.	strategy will be explored for this risk of displacement, which is considered low.
Expansion of monoculture forests	This situation could extend to northern regions of the Exotic Species Program Area (RE) due to the high economic returns from plantations there. Maps from the Land Registry indicate that this is a relatively common transition in these regions, particularly the substitution of tree-filled scrubland, which is now considered a native forest. However, national mitigation measures, such as strengthened inspection by CONAF, environmental awareness and the recognition of native forests, are expected to prevent this type of displacement. Focusing on mitigation in terms of planning and territorial legislation with a view to prohibiting such substitution in certain areas could cause displacement to other areas within the RE. However, planning also involves designating optimal areas for establishing new exotic plantations where substitution would cause less environmental damage, thereby reducing the overall displacement risk.	The 2024 public call applies strict restrictions and a total ban on vegetation replacement. Afforestation with exotic species (such as pine or eucalyptus) is established as an absolute exclusion criterion, guaranteeing that all projects exclusively use native species to avoid environmental degradation. Likewise, any action that involves the removal, reduction, or substitution of natural vegetation cover is grounds for inadmissibility. Instead, the call incentivizes the preservation and improvement of native forests by funding programs such as Afforestation and Revegetation, aimed at establishing new permanent native cover, and Ecological Restoration and Post-Fire programs, focused on the recovery and enhancement of degraded ecosystems. To ensure compliance with this strategy, applicants must strictly adhere to current forestry regulations and have a Forest Management Plan approved by CONAF for management and dendroenergy measures. Finally, the regional technical teams validate the viability of the surfaces on the ground to ensure that each intervention conforms to sustainable territorial planning and the environmental management frameworks of the ENCCRV. As part of the measures related to planning at the territorial level, it is expected that priority areas for exotic plantations will be delimited through the Regional Territorial Planning Plans. The above, considering that in 2018 Law No. 21,074 was enacted regarding the strengthening of the regionalization of the country and which modifies Law No. 19,175. The objective of this law is to regulate the preparation and approval of Regional Territorial Planning Plans in coherence with the regional development strategy, the national territorial planning policy, the long-term climate strategy and the regional climate change action plan. The plans are

DD cause/driver	ERPD proposed strategy to reduce displacement risks (2016)	Strategy update for report period (2024) ¹⁷
		instruments that guide the use of the region's territory for sustainable development, define strategic guidelines and macrozoning of the territory, establish binding conditions for the location of waste, infrastructure and productive activities and recognize areas under State protection.

Effectiveness of organizational arrangements and involvement of partner agencies

CONAF has a governance structure at the national and regional level that has allowed it to effectively implement the ER Program and ENCCRV actions. The organizational structure of CONAF is based on a clear chain of command with well-defined instances and roles, also including agile information systems. It has allowed for the generation of governance instances along with internal functional arrangements to institutionalize and operationalize ENCCRV actions in the regions of the ER Program. As an institution spread across various territories, CONAF has a central office led by an Executive Directorate, Management, Advisory Units and Department which all contribute to the implementation of the strategy at the regional level. The Forest and Climate Change Management (GBCC, acronym in Spanish) is responsible for directing and leading the ENCCRV.

The units and departments associated with the ER Program in the reporting period are, from the central level, the Climate Change and Ecosystem Services Department (DCCSE, previously UCCSA acronym in Spanish) as the leading technical entity, the Secretariat of Indigenous and Social Affairs (SAIS, acronym in Spanish), the Prosecution Office, and the Environmental Assessment Department. Also, the Interagency Committee on Climate Change of CONAF, permanent instance with the function of coordinating all institutional actions associated to the ENCCRV, has ensured the institutionalization of both the technical activities and safeguards treatment. This structure has allowed for the development of the Strategy to be systematic, efficient and be progressively inserted in the institutional work for the scope of the proposed goals and objectives. DCCSE has also been a key instance at the central level for enabling the ENCCRV result – based payment phase. Acting as a Focal Point for REDD+, it has coordinated international cooperation associated with REDD+, also being in charge of the administrative, financial and technical aspects of projects, including the approach towards consideration and compliance with safeguards.

In addition, the [CONAF Civil Society Council \(COSOC, acronym in Spanish\)](#) continues to play an active role in BSP governance. As a non-binding, advisory citizen participation mechanism, its actions are reported and its recommendations incorporated into the different areas of technical work, including developments in the implementation of ENCCRV. During the reporting period, COSOC maintained its participation as part of the institutional arrangements for BSP governance through annual meetings, where the system's progress and projections for the ENCCRV were presented.

At the local level, and as a way of ensuring the effectiveness of institutional management in the implementation of ENCCRV at the regional level, there are DCCSE representation offices in all regions that are part of the ER Program. This role is fulfilled by a Coordinator of Forest and Climate Change, who reports administratively to the Climate Change and Forest Departments (DBOCC, acronym in Spanish). These are professionals with a long-standing institutional track record, with experience in project management and community relationships. In those regions where ENCCRV pilots and/or projects have been developed, these coordinators actions have been reinforced by support professionals, who contributes towards management of projects in general and safeguard follow up, monitoring and reporting, as is the case for Regional Managers for Indigenous and Social Affairs.

Regarding the efficiency of institutional arrangements for the generation, reporting and integration of information with other State agencies, it is worth mentioning that the sources of basic information for the implementation of the ER Program Monitoring Plan, based on the [National Forest Monitoring System](#), have been, i) Cadastre of Vegetation Resources and statistics on forest fires developed by CONAF, ii) the Continuous Forestry Inventory developed by the National Forestry Institute (INFOR, acronym in Spanish), both institutions part of the Chilean

Ministry of Agriculture (MINAGRI, acronym in Spanish). Statistics on areas affected by forest fires have been permanently updated through the Digital Information System for Operations Control (SIDCO, acronym in Spanish) and reported in a yearly basis for each season in the period. Besides the afore mentioned basic information, there is a set of second order information, which has to be generated within the ER Program Monitoring Plan framework, such as density plot or stock charts for estimating degradation in all AA forest types, which is being implemented through a specific agreement between CONAF and INFOR.

Regarding consistency between the Forest Reference Level and the National Greenhouse Gas Inventory (INGEI, acronym in Spanish) developed by the Ministry of the Environment (MMA, acronym in Spanish), the CONAF and INFOR technical teams have been the technical entities in charge of building the greenhouse gases inventory for the Silviculture and Other Land Uses sectors along with ensuring the alignment between the methods applied, with the purpose of improving and maintaining the consistency of both instances. The necessary institutional arrangements to formalize the joint work between services and ministries have been made, such as the Intra – Ministry Technical Committee on Climate Change ([CTICC, acronym in Spanish](#)), instance coordinated by the Office of Agricultural Studies and Policies ([ODEPA, acronym in Spanish](#)) and composed of all MINAGRI services acting as reviewers for the ER Program and all ENCCRV initiatives, strategic and technical orientation, decision reinforcement and progress report review.

Finally, as international cooperation from different sources has continued and intensified (Section 1.1.1), CONAF has generated and enhanced an internal governance structure to manage international cooperation and strategic partnerships with implementing agencies that provide administrative and technical support, principal among them being the relationship with the Food and Agriculture Organization of the United Nations (FAO).

The CONAF Prosecutor's Office unit, in conjunction with the Management of Protected Wild Areas, began work to implement [Law No. 21,600](#), which created the Biodiversity and Protected Areas Service and the National System of Protected Areas, published in the Official Gazette on September 6, 2023. The CONAF Prosecutor's Office, in conjunction with the Directorate of Protected Wild Areas, began work to implement Law No. 21,600, which created the Biodiversity and Protected Areas Service and the National System of Protected Areas, published in the Official Gazette on September 6, 2023. In 2024, meetings were held between the involved entities to ensure the proper execution of each institution's legal responsibilities, establishing collaboration mechanisms, avoiding duplication and dysfunction in the implementation of the National System of Protected Areas, and drafting the 27 regulations necessary for the law to be applicable.

During 2023, the Prosecutor's Office provided advice to the Executive Directorate to resume the processing of the Bill that transforms the National Forestry Corporation into the National Forest Service, based on the reactivation of the processing of Bulletin 11,175-1. In May 2025, [Law No. 21.744](#) was enacted, establishing a decentralized public service that will be the successor to CONAF and will have the power to lead the plans for the restoration and recovery of forests. The work carried out with various public and private entities has led to the preparation of indications by the Executive Branch that have been aimed at strengthening the purpose, functions and attributions of the public service, with a view to sustainable development and modernizing the current work carried out by CONAF. Also, in the parliamentary procedure itself, technical aspects have been contributed to the sessions that have been held with a view to the National Forest Service being able to transform the current CONAF into a public service, honoring the commitments made in labor matters that have been reached with the trade union organizations and that guarantee full respect for the labor rights of CONAF workers. ensuring that the transition of these to the new service is carried out safeguarding labor rights and guaranteeing non-regression in this area. The transformation of CONAF into the National Forest Service will strengthen the sector's institutional framework and allow the development of forestry laws in accordance with the requirements of society.

Financial Plan Updates

It was proposed in the ERPD Chilean document of 2016 that the ENCCRV implementation would require an estimated budget of \$174 million dollars for 9 years, 30% of which would be unconditional and the remaining 70% (\$121 million dollars) would be conditional on the management and obtention of external resources by CONAF. Then, in the

document titled “Additional background for the update of the Chilean ER Program, according to recommendations by the Chair’s Summary in the 15th Meeting of the Carbon Fund” in 2018, an update is proposed for the Initial Plan.

This update has defined the budget for a nine-year period, considering available experiences and better information about the costs of action measures, variations between region and forest types, among other aspects. Therefore, to finance all ENCCRV action measures, the new financial estimate including conditional and currently available factors amounts to \$357 million dollars. This includes international bilateral and multilateral contributions, donations, and results – based payments, along with national private and government contributions. Out of all this, 23% come from international sources while the remaining 77% is national. In addition, 40% is unconditional and the remaining 60% is conditional. From the already mentioned financial sources, to meet the goals of the ENCCRV it will be critical to establish a public – private partnership work, aside from promoting regional initiatives of local funds, on which progress has been made due to the reinforcement of capabilities installed in the various regions of Chile through preparation funds.

It is important to consider that the ENCCRV non – conditional budget corresponds to state resources allocated to CONAF through the Budget Law, and that such funds have and will continue to reinforce the compliance of ENCCRV goals. Some of the actions financed through this government source during the ER program report period in order to reinforce activities associated to reducing deforestation and forest degradation have been: i) reinforcement of the firewood energy promoters program; ii) the interoperability of the platforms of the Forestry Promotion and Development Management System (SIGEFOR, acronym in Spanish) with other CONAF platforms to enhance operability; iii) the capability of on-site teams; iv) reinforcement of the Early Warning System (SAT, acronym in Spanish) for the detection of unauthorized forest felling using satellite images and drones, v) the development of a mobile app for the detection of unauthorized forest felling, and vi) a traceability system for native forest primary products. Also, the “Communities Prepared against Forest Fires” program has been strengthened, doubling its impact on 2018 along with the development of manuals and programs for the technical implementation of 7 ENCCRV direct action measures.

As part of the new financial plan, CONAF has been working with the Agency of Sustainability and Climate Change to establish similar public – private synergies and guide actions to leverage resources for actions aligned with the ENCCRV and the ER Program. These actions correspond to fire prevention, forest planning and restoration of areas affected by forest fires through compensation mechanisms that must be applied by private companies, mainly from the real estate and mining sectors. In line with this, [financial instruments](#) are being formulated together with the Production Development Corporation (CORFO), with such instruments being used to attract private investments for native forest management mainly for wood and energy purposes. From the business sector, an agreement has been made by forestry companies, with technical support by CONAF, to direct efforts towards restoring native forests affected by massive forest fires in the 2017 season, encompassing two of the five AA regions. Also, financial resources provided by the Undersecretary of Agriculture have been added, along with a redirection of funds managed by the Foundation for Agricultural Innovation (FIA, acronym in Spanish) and the MMA through its [Environmental Protection Fund \(FPA, acronym in Spanish\)](#). In this context, companies have invested nearly \$80 million dollars, which implied a 60% increase in relation to the average historical expenditure on such issues.

This new financial plan, in line with the Benefit-Sharing Plan (BSP), establishes that 20% of the total funds available from ER Program payments (\$5.2 million dollars) will be allocated to actions that support the sustainability and enabling conditions of the Program. These resources will finance ENCCRV facilitating measures and other complementary actions, including inspection activities, regularization of property ownership titles, environmental education, communication and dissemination activities, and the strengthening of CONAF institutional programs, among others. These actions may be implemented throughout the Program implementation period and, where necessary, may continue beyond 2025.

Finally, the ER Program considers that 80% (\$20.8 million dollars) out of the total resources will be directed towards the population as non – monetary benefits, through technical assistance by strengthening Forestry Extension and forestry management actions where the main focus will be on lands belonging to small and medium scale forest

owners, along with public lands. This dynamic applies to all payments perceived by Chile from emission reductions as established in the BSP.

In 2024, the UN REDD+ Program approved technical assistance resources for the development of analytical inputs to support the preparation of a financial planning proposal for the ENCCRV and the sectoral NDC that allows their financial sustainability, this also included updating the cost projection of the measures comprising the ENCCRV for the period 2025-2030, taking into account the commitments established in the update of the Nationally Determined Contribution (NDC) submitted by Chile to the United Nations (UNFCCC) in 2020, as well as the subsequent strengthening of these commitments in 2022.

1.2 Update on major drivers and lessons learned

Update on major drivers of deforestation, degradation and non – increase of forestry sinks in the Accounting Area.

The Chilean ERPD document of 2016 detailed the process of the identification, prioritization and characterization of the main drivers or causes of forest degradation, deforestation and non – increase of causal sinks for the PRE. This information was used as a basis for the proposal of the strategic actions which formed the ENCCRV action measures. For the 2024 reporting period, no significant changes were identified in the drivers that affect native vegetation resources in the AA. The only document related to any change of the drivers is “Additional background for the update of the Chilean ER Program, according to recommendations by the Chair’s Summary in the 15th Meeting of the Carbon Fund” from October 2018¹⁸, and it is related to the 2017 forest fires episodes.

The drivers’ analysis presented in the Chilean ERPD was conducted with a methodology that included the collection and systematization of information about participative processes and specialized consulting. These analyses have not been conducted again in the reporting period, therefore, the update on the status of the drivers presented below corresponds to a proposal based on updated statistical data, technical analysis of professional teams, and sectorial trends in the reporting period.

Causes or Drivers of forest degradation, deforestation and non – increase of sinks	Relevance defined in ERPD 2016	Relevance 2024 reporting period	Observations/sources of information
DIRECT CAUSES¹⁹			
Forest fires	Very high	Very high	Wildfires remain the primary driver of degradation and deforestation within the AA. According to the SNI (2024) ²⁰ , their impact has intensified due to prolonged drought conditions, which have increased both their frequency and severity. This condition is the principal factor shifting the trend in the national GHG balance, resulting in extreme anomalies. A notable example occurred in 2017, when fire-related emissions were nine times higher than the historical average, reaching black carbon levels comparable to those of the nation's entire energy sector.
Unsustainable use of vegetation resources for production	Very high	Very high	The unsustainable extraction of forest resources remains a critical concern, primarily driven by a steady increase in firewood consumption. According to the SNI (2024), annual consumption reached 13.2 million cubic meters by 2022, marking a 74% increase since 1990. While harvesting historically targeted native species, a significant shift has occurred over the last decade; since 2011, the share of exotic species has risen to 55% of total

¹⁸

https://www.forestcarbonpartnership.org/system/files/documents/Chile%20Doc.%20ERPA%20ENCCRV_Version%208%20_16_10_2018%20limpio-v3%20%28english%29.pdf

¹⁹ The names of the causes have been updated as per the official ENCCRV document from 2016.

²⁰ https://snichile.mma.gob.cl/wp-content/uploads/2025/03/2024_DIN_CL.pdf

Causes or Drivers of forest degradation, deforestation and non – increase of sinks	Relevance defined in ERPD 2016	Relevance 2024 reporting period	Observations/sources of information
			consumption, displacing native species, which now account for 45%. This pressure, compounded by the fact that harvesting predominantly involves live trees rather than deadwood collection, represents a major driver of forest degradation and black carbon emissions within the energy sector.
Unsustainable use of vegetation resources for livestock	High	High	Grazing remains a significant determining factor in the national emissions profile. According to SNI (2024) data, 46% of agricultural emissions in 2022 were concentrated in the Los Lagos, Los Ríos, and Araucanía regions. Although the cattle herd has decreased by 29.2% since 1990 due to market dynamics, pressure on vegetation remains substantial; urine and manure deposited during grazing account for 14.3% of direct N2O emissions from agricultural soils. The implementation of Tier 2 methodologies for cattle has facilitated the systematization of country-specific emission factors, capturing the variability of livestock practices at the subnational level. This underscores that livestock management within grasslands and forests continues to be a critical component of the country's greenhouse gas dynamics.
Forest monoculture expansion	High	Low	According to data from Chile's Technical Annex (2024), the assessment of forest plantation expansion reveals that this activity is no longer a primary driver of degradation. There has been a drastic reduction in the conversion of native forests to plantations, falling from a historical average of 8,615 ha/year (2001–2013) to just 370 ha/year during the 2020–2021 monitoring period. Current efforts prioritize restoring forest cover by transitioning land previously designated for industrial use into permanent forest ecosystems, thereby reversing the historical impact of plantations on the sector's carbon balance.
Agriculture and livestock activity expansion	Medium	Low	The extent to which agricultural and livestock expansion drives native forest loss has continued to decline, reinforcing the trend observed since 2014. According to the REDD+ Technical Annex (2024), the annual deforested area resulting from conversion to other land uses, including agriculture and pastures, decreased from a historical average of 6,470 ha/year (2001–2013) to 4,953 ha/year during the 2014–2016 monitoring period. As of 2024, the assessment highlights that the pressure to clear land for agricultural use has been increasingly offset by a significant net increase in forest area.
Urban and industrial activity expansion	Medium	High	The expansion of urban settlements has resulted in a 74% increase in total land area between 1990 and 2022, according to the SNI (2024). During this period, the conversion of forest land into urban settlements escalated by 73%.
Industrial activity expansion	Low	Low	The significance of industrial activity has undergone a major shift, evolving from a negligible factor into a persistent driver of emissions and land-use change. By 2022, the 'Settlements' category—encompassing industrial sites and mining operations—reached 866,706 hectares, representing a 110% increase since 1990. This expansion is directly linked to land conversion, with the transformation of Forest Lands into Settlements being the primary contributor, accounting for 64.5% of emissions within this subcategory. Regionally, mining and heavy industrial impacts are concentrated in Antofagasta, Valparaíso, and Biobío, where emissions from the Energy and Industrial Processes and Product

Causes or Drivers of forest degradation, deforestation and non – increase of sinks	Relevance defined in ERPD 2016	Relevance 2024 reporting period	Observations/sources of information
			Use (IPPU) sectors are dominant. This reflects the increasing contribution of industrial and mining infrastructure to the country's territorial emission dynamics.
Effects of climate change, desertification, land degradation and drought	Medium	High	The significance of this factor has evolved into a critical, systemic threat, as the frequency and severity of disturbances have escalated in tandem with a prolonged national drought. This extreme climatic condition has reduced the carbon sequestration capacity of forested lands by 60% since 1990. The most detrimental impact of this scenario is the intensification of wildfires, which drastically destabilizes the national GHG balance. Furthermore, water stress and drought-related pests have necessitated a downward revision of growth rates in major forest plantations across the south-central region ²¹ . The persistence of these adverse conditions not only hinders natural forest regeneration but has also caused regions such as Maule, Ñuble, and Biobío to transition from historical carbon sinks to net emitters during years of extreme wildfire activity.
Plagues and diseases	Low	Medium	The significance of this factor has transitioned from a potential risk to a direct, quantifiable impact on the carbon sequestration capacity of forest ecosystems. The persistence of the prolonged drought has served as a primary catalyst, exacerbating pest-related disturbances and necessitating a downward revision of growth rates for major plantation species across the country's south-central region.
Effects of contamination	Low	Low	According to the SNI (2024), emissions of carbon monoxide (CO), nitrogen oxides (NOx), non-methane volatile organic compounds (NMVOCs), and sulfur dioxide (SO2) within the industrial processes sector have seen a combined increase of 479.9% since 1990. Similarly, the black carbon report identifies residential biomass combustion and the use of heavy machinery in mining and construction as critical sources of local pollution. These activities contributed substantially to the 24.9 kt of black carbon emitted nationwide in 2022.
Overexploitation of water	Low	Low	These determining factors were not detailed in the ERPD, as they were not prioritized within the ENCCRV analysis; furthermore, significant uncertainty persisted regarding the data sources required for their characterization. Consequently, it is maintained that these factors continue to hold low relevance.
Soil erosion	Low	Low	These determining factors were not detailed in the ERPD, as they were not prioritized within the ENCCRV analysis; furthermore, significant uncertainty persisted regarding the data sources required for their characterization. Consequently, it is maintained that these factors continue to hold low relevance.
INDIRECT CAUSES			
Public policy deficiencies for regulation	Very high	Very high	The significance of this factor remains very high. While substantial progress has been made through the Framework Law on Climate Change and the Long-Term Climate Strategy, a significant regulatory misalignment persists between existing forestry promotion instruments—such as Law 20,283—and the sector's capacity to achieve its climate targets and address emerging environmental challenges.

²¹ https://snichile.mma.gob.cl/wp-content/uploads/2025/03/2024_DIN_CL.pdf

Causes or Drivers of forest degradation, deforestation and non – increase of sinks	Relevance defined in ERPD 2016	Relevance 2024 reporting period	Observations/sources of information
Deficiency in public policies due to promotion or development	High	High	The significance of this factor remains High, unchanged from the previous reporting period. While substantial progress has been made through the Framework Law on Climate Change and the Long-Term Climate Strategy, important gaps remain in the alignment of existing forestry promotion instruments—such as Law 20,283—with the sector’s capacity to achieve its climate targets and address emerging environmental challenges. In addition, limited and insufficient financial resources constrain the effective implementation and scaling-up of forest conservation, restoration, and sustainable forest management actions, reducing the capacity to fully address the needs identified across the territory.
Poor knowledge and cultural valuation of vegetation Resources	Very high	Very high	The relevance of this factor remains very high. Although extensive training and capacity-building workshops have been conducted under the ENCCRV framework, with a significant emphasis on gender (49%) and indigenous participation (77%), a structural gap persists. The prevalence of unsustainable practices and informality within the firewood market indicates that the cultural valuation of native forest ecosystem services has yet to fully offset prevailing economic pressures and the underlying dynamics of degradation
Informality in firewood markets	High	High	The significance of this factor remains high. According to INFOR (2024), domestic consumption stands at 12 million m ³ solid/year ²² , exceeding previous estimates. The 2024 Logging Yard Characterization Study reveals that 30% of facilities operate without official registration, while only 24% hold quality certifications ²³ . This persistent structural informality, coupled with initial enforcement challenges under Law No. 21,449, continues to incentivize unregulated logging and the degradation of native forests across the regions within the Accounting Area.
Rural poverty, lack of opportunities	High	High	The significance of this factor remains high, as rural poverty and socio-economic vulnerability persist across the regions of the AA.
Deficiency in public policies due to limited oversight capabilities or enforcement	Medium	Medium	The significance of this factor remains medium. In 2024, CONAF strengthened its response capacity through high-frequency satellite monitoring and precision drones, detecting 5,427 hectares of land-cover change and conducting 4,813 annual inspections ²⁴ . However, given the vast territorial extent of the Accounting Area (AA), the scope of oversight remains contingent upon the prioritization of regions at the highest risk of forest degradation
Low profitability, opportunity costs	Medium	Medium	The significance of these factors remains medium, as there have been no substantial shifts in financial returns or in the opportunities associated with native forest management.
Economic Model Deficiency for the Use of the Native Forest (NF)	Medium	Medium	
Disputes or problems due to fragmentation of property	Medium	Very High	The significance of this factor is very high and is currently undergoing a new regulatory phase. According to the CECT (2024), the country has more than 350,000 rural subdivisions,

²² <https://www.infor.cl/images/MEMORIA-INFOR-2024/54/>

²³ <https://fedemaderas.org.co/wp-content/uploads/2025/03/CARACTERIZACION-DE-ACOPIOS-DE-LENA-2024.pdf>

²⁴ https://www.conaf.cl/wp-content/uploads/2025/08/cuenta_publica_conaf-2024.pdf

Causes or Drivers of forest degradation, deforestation and non – increase of sinks	Relevance defined in ERPD 2016	Relevance 2024 reporting period	Observations/sources of information
			with exponential growth reaching 71,000 new lots annually by 2022. Within the Accounting Area (AA), the footprint of these subdivisions already exceeds planned urban limits, notably in regions such as Los Ríos (128%) and Los Lagos (61%) ²⁵ . This phenomenon has caused irreversible fragmentation of carbon sinks and heightened wildfire risks on subdivided properties, prompting the introduction of the 'Bill for the Protection of Territory and Rural Life.' This legislation aims to replace Decree-Law 3,516, ensuring land-use practices that promote sustainable food production and the conservation of natural resources
Disputes or problems due to property tenure	Low	Medium	The significance of this factor remains medium, for the reporting period (unchanged from the previous reporting period), increasing from the ERPD. As of 2024, irregular land tenure continues to be the main barrier preventing small landowners from accessing CONAF's benefit programs. According to the Ministry of National Assets, although 6,584 titles have been issued ²⁶ , the historical gap and protracted land-titling processes, which can take up to 24 months, impede a timely response to forest degradation. This legal uncertainty not only disincentivizes investment in restoration but also undermines the long-term stability of native forests as carbon sinks
Deficiency of the forest institutional framework	Low	Low	This remains a factor of low significance, as 2024 marks a critical milestone with the implementation of the SBAP Law (No. 21,600) and the finalized processing of SERNAFOR. While these structural changes have necessitated a complex administrative transition, they are not expected to significantly impact the underlying drivers of degradation, deforestation, or the expansion of carbon sinks.
Lack of association for farmers	Low	Low	This remains a factor of low significance. According to INFOR (2024), although a low level of productive collaboration persists among forest owners, thereby limiting the tangible impact of government incentives ²⁷ on vegetation recovery and carbon sequestration, this gap is not expected to significantly alter the broader dynamics of degradation, deforestation, or the expansion of carbon sinks.
Stigmatization of forest plantations	Low	Low	The significance of this factor remains low. Although social and technical debates regarding exotic plantations persist, their impact is minimal as promotional activities under the ENCCRV are legally restricted to the exclusive use of native species. Strengthened enforcement against land-use conversion, combined with a strategic focus on smallholders, ensures that negative public perceptions of the industrial forestry model do not constrain the expansion of carbon sinks within the AA
Management plans do not ensure sustainable use	Low	Low	The relevance of this factor remains low. Although progress has been made in oversight and monitoring capabilities using high-resolution satellite imagery (Planet Explorer) and drones, effectively narrowing the information gap, and despite the integration of climate adaptation criteria into technical plan

²⁵ https://centrodeestudios.minvu.gob.cl/wp-content/uploads/2024/10/El-impacto-de-las-parcelas-de-agrado-en-Chile_Minvu-2024.pdf

²⁶ https://www.bienesnacionales.cl/wp-content/uploads/2024/07/CUENTA-PU%CC%81BLICA-PARTICIPATIVA-2024_compressed.pdf

²⁷ <https://bibliotecadigital.infor.cl/handle/20.500.12220/32754>

Causes or Drivers of forest degradation, deforestation and non – increase of sinks	Relevance defined in ERPD 2016	Relevance 2024 reporting period	Observations/sources of information
			formulations, the total area under active management remains limited

1.3 Methodological deviations

No methodological deviations were used in this monitoring report.

2 SYSTEM FOR MEASUREMENT, MONITORING AND REPORTING EMISSIONS AND REMOVALS OCCURRING WITHIN THE MONITORING PERIOD

2.1 Forest Monitoring System

Organizational structure, responsibilities, and competencies, linking these to the diagram shown in the next section

The National Forest Monitoring System (NFMS) of Chile has been established for monitoring forests and operates on existing systems supported by various institutions which underpin and maintain it, which produces a functional link among its multiple building elements.

The NFMS in Chile is coordinated by CONAF, institution serving as REDD+ Focal Point to the UNFCCC (CMNUCC in Spanish) in accordance with Decision 10/CP.19. CONAF operating under the MINAGRI who gives the REDD+ Focal Point to the Climate Change and Ecosystem Services Department (DCCSE) of the Forest and Climate Change Management (GBCC, acronym in Spanish). As the REDD+ focal point, DCCSE has the responsibility of being the organization in charge of coordinating the generation and reporting of elements linked to REDD+, which includes the responsibility of coordinating the NFMS, reporting and generation for FREL/FRL and REDD+ result reports.

Inside CONAF, there are other units with the main responsibility of generating activity data. Among them, the Monitoring Department (DM, acronym in Spanish) of the Environmental Evaluation and Oversight Management (GEF, acronym in Spanish), has a primary role for the generation of base information. DM is responsible for implementing the mandate established by Law No. 20,283 of 2008, which establishes that CONAF “Will maintain a Forest Cadastre, which is to identify and establish, at least cartographically, the forest types that exist in each region of Chile”.

The Forest Cadastre, called “Cadastre of Native Forests and Vegetation Resources”, is the main source of information for the development of Land – Use Change Maps, also developed by DM for the continuous monitoring of vegetation cover in Chile.

As the next figure shows, CONAF also includes the participation of the Forest Fire Protection Management (GEPRIF, acronym in Spanish) through the provision of information by means of the Operation Control Digital System (SIDCO, acronym in Spanish) and GEF using the Forestry Administration and Control System (SAFF, acronym in Spanish).

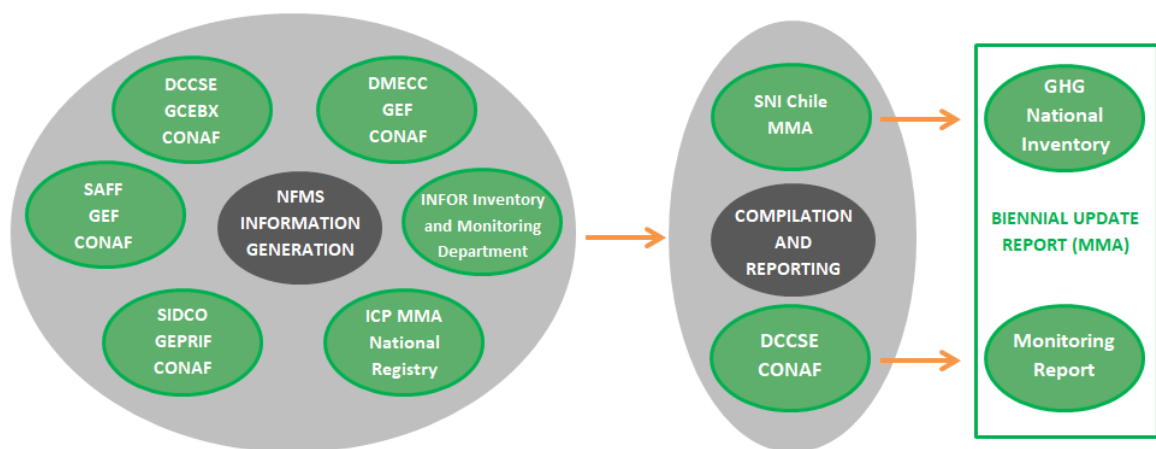


Figure 1. NFMS Organizational Structure of Chile.

Within GEPRIF, The Protection against Forest Fires Department and its Digital Information System for Operation Control ([SIDCO](#)), provides annualized statistical information on the occurrence of forest fires in the entire country. On the other hand, SAFF provides information about the implementation of forestry management plans. Finally, also within CONAF, The Protected Wilderness Areas Management (GASP, acronym in Spanish) is responsible for providing information on conservation areas in the National System of Wilderness Protection Areas or SNASPE.

Together with the CONAF units, activity data for the NFMS is provided by the Forestry Institute INFOR and the Ministry of the Environment (MMA, acronym in Spanish). INFOR is established as a private law corporation, part of MINAGRI, with such institution providing public funding for the design, technological development, implementation, and execution of the National Forestry Inventory.

Information about emission factors for forest monitoring comes from the National Forestry Inventory or INF, administered by INFOR which is also used by the Chilean National Greenhouse Gases Inventory System ([SNICHile](#)), administered by the Climate Change Office, which arises as a response to the need to inform the citizens about GHG emissions and removals in the country.

Emission factors are monitored by INFOR through inventory plots and reported annually through IFN national reports. Emission factors are applied to the NFMS by forest type and/or region, depending on the REDD+ activity evaluated.

The Ministry of the Environment is the State organ in charge of working with information provision on private conservation initiatives (ICP, in Spanish), for their incorporation to the accounting of areas subject to conservation. The [National Registry of Protected Areas](#) was established within the MMA, which operates as an information platform where the 9 categories are considered protected areas (Marine Park, Pristine Regions Reserve, National Park, Natural Monument, Forest Reserve, National Reserve, Marine Reserve and Multiple Use Coastal Marine Areas), aside from Private Protected Areas and Community / Private Conservation initiatives, encompassing the entire national territory.

The selection and management of GHG related data and information

The information and data selected to be incorporated to the NFMS, have been defined by Chile in the ERPD on which the subnational FREL/FRL was established. Selected information and data remain for this monitoring report, being managed by DCCSE for the monitoring and reporting.

Activity data: Land use and land use changes maps²⁸

Land use data selected for the FREL/FRL were those coming from existing Native Forest Cadastres in regions of the Accounting Area. The information provided by the Cadastre is regularly updated by the Monitoring Department (MD) of CONAF, describing 9 Land uses and 20 Sub – uses, along with other breakdowns by altitude, cover and structure. Nevertheless, as indicated in Annex 4 of the first Monitoring Report, the reference level was corrected by incorporating spatially explicit use change data estimated based on reference maps for evaluation instances 2001 and 2013. Such maps are developed through the implementation of a semi – automated methodology for change detection that operates on Landsat images analyzed in Google Earth Engine by applying the land use definitions defined by Chile in the Cadastre of Native Forests.

REDD+ activities and sub – activities that occur in forest remaining forests

The data selected for the estimation of emissions and captures from activities that occur in forest remaining forests are those indicated in the ERPD and refer to data coming from plots in the Continuous Inventory of Forest Ecosystems or National Forest Inventory (IFN) by INFOR, combined with spectral information from the Landsat series. This information integrates forest state variables on the number of trees per hectare and basal area registered in the IFN plot monitoring, with Landsat spectral data in order to estimate carbon stocks in a spatially explicit manner.

Satellite Information²⁹

The generation of activity data in land use change activities and change detection is developed based on spectral information from the Landsat data, including collection 2 from L8 and L9. To obtain satellite images that are representative of the beginning and end of each period, NFMS has been corrected through work with multi – pixel mosaics that require a time range for the search for cloud free images and the selection of the pixels that comprise such images. The multi – pixel mosaic is an image comprised of pixels from various images, extracted from the definition of a time range or window. The selection of each pixel seeks to define the best available information for a given area, with the priority being pixels free of clouds and shadows of such clouds.

²⁸ Land Use Change Maps are available in <https://plataforma.encrcv.cl/static/erpa/mr4/mapas/CUT-MR4.zip>

²⁹ SOP 1 available in https://plataforma.encrcv.cl/static/erpa/mr4/sop/SOP_01_MR4.zip

Given the large number of clouds in the south of Chile, this time window will correspond to a range of ± 3 months for the starting date of the period and the end date of the analysis period respectively, as it corresponds to the dry season period in Chile. As an example, for 2024 where the starting date is January 1, 2024, the time range or window will cover between October 1, 2023, to March 31, 2024. For the end of the period until December 31, 2024, the time range for multi – pixel mosaic estimation will address from October 1, 2024, until March 31, 2025.

For pixel selection, a code is applied in Google Earth Engine where median NDVI values are selected for pixels corrected to land surface. NDVI medians are selected with the purpose of not incorporating phenological states of vegetation with high photosynthetic activity or vigor but rather selecting values that do not alter the outcome of the method application.

Information administration and Management

The management of information is led by the Climate Change and Ecosystem Services Department (DCCSE) of CONAF through an infrastructure hosted on an institutional CONAF server. Access for database editing and administration is restricted and can only be carried out through the institutional network using a VPN connection and password authentication.

The baseline information provided by the Monitoring Department, INFOR, and the Climate Change Department is stored as tables within the institutional server. These tables are subsequently connected to the calculation tools through PowerQuery, enabling the updating and traceability of the information used in the estimation processes.

The calculation tools are internally stored in different Drive folders organized by topic and version. The final versions of these tools are subsequently uploaded to the ENCCRV platform in order to facilitate access and downloading by the corresponding users.

The data used for the NFMS and the REDD+ results reports are public and made available to the community through the various download links provided throughout the document, which are generated from the ENCCRV platform. CONAF is responsible for the information and, therefore, holds the intellectual property rights associated with it.

Processes for collecting, processing, consolidating, and reporting GHG data and information

The main processes for collecting, processing, consolidating, and reporting GHG emissions in NFMS are described below.

- Activity data generation

Activity data generation is also divided into land use change activities, obtained from land use change maps, and activities on forest remaining forests associated with the development of carbon flow and stock maps for forest degradation.

These elements are generated through two base official inputs, respectively: Land use and land use change surfaces from land use maps based on the Native Forest Cadastre and Carbon content and variation in forest carbon stock from the Forest Inventory. Both processes are based on satellite data.

Land Use and Land use change map development³⁰

The development process for land use and land use change maps has been a common task of DCCSE and DM, with the purpose of defining forest dynamics related to land use changes.

For the 2024 monitoring period, the process starts with the development of one Land Use Change Map per region, based on satellite mosaics and the MIICA³¹ change detection method. To apply the MIICA method, change detection thresholds must be defined to ensure the spectral values register empirical changes. Change categories are mentioned in the CONAF “Protocolo metodológico para la elaboración de mapas De usos y cambios de usos de la tierra”³².

³⁰ Land Use and Land Change maps are available in <https://plataforma.enccrv.cl/static/erpa/mr4/mapas/CUT-MR4.zip>

³¹ The MIICA methodology is based on the combination of 2 spectral indices (dNBR, dNDVI) which, through integration rules, provide coverage of land use change, indicating the magnitude and directionality of the change.

³² Available in https://plataforma.enccrv.cl/static/erpa/mr4/sop/SOP_02_MR4.zip

Land Use Change Map Validation³³

The land use land use change map validation is implemented by comparing the results in reference maps to observations obtained through Open Foris: Open Foris Collect Earth and its Google Earth interface, Collect Earth.

The validation starts with pre – sampling process to estimate the accuracy of IPCC land sub use.

The land use change map polygons are first selected from pre sampling points and then, entered in Google Earth so ground truth can be collected from Collect Earth surveys. Both data collection and user accuracy estimation are conducted in the same way as the sampling, through confusion matrixes.

Reference data are selected based on the pre sampling, through a random sampling design stratified for IPCC land sub use by region. This sampling type also allows us to report the accuracy and surface evaluated for land change category, aside from adjusting a sample size that ensures global reliability in the evaluated areas (Olofsson et al., 2014).

Surface by IPCC land sub use information in vectorial format is necessary for the sampling design, reducing processing times in the server. User accuracy parameters for land sub use are obtained from the pre sampling stage, which are then entered into the platform as expected user accuracy values, considering a 0.01 standard accuracy error (Olofsson et al., 2014).

Activities and sub activities related to forest remaining forests³⁴

The process is based on the methodology detailed in Bahamondez et al. (2009), which considers number of trees per hectare and basal area monitored by the inventory as input variables. It refers to spatially explicit information which location is known, applying an interpolation process for carbon flux and stock in the analyzed periods.

Forest Inventory plots, from the IFN, are placed in a density plot or stock chart, based on the number of trees and basal area per hectare. The density plot considers thresholds which determine, for forest types, their status at the measuring moment. This information identifies the state of plots, distinguishing between degraded and non-degraded plots (Bahamóndez, 2009).

In the case of the methodology applied in the NFMS, B line or B threshold will allow the degradation in forest remaining forests and restoration in degraded forests to be identified. Line B represents the limit where trees can develop large treetops and completely occupy the site capacity without excessive competition (Gingrinch, 1967). The limit for this threshold was established through field work by experts and is specific for each forest type (INFOR, 2012). Line B is considered the natural resilience threshold of a forest. Plots located below the B line or threshold are not recommended for productive work.

Forest types with density diagrams available and incorporated to the degradation estimation methodology are the following: Roble – Raúlí – Coihue (RoRaCo in Spanish), Siempreverde, Canelo, Lenga – Hualo (RoHua), Coihue – Raúlí – Tepa (CoRaTe), Coihue de Magallanes, Spinal subtype Esclerófilo and Esclerófilo.

The IFN is designed under a two-stage statistical design concept, in clusters of three concentric circular plots of an area equivalent to 500m², distributed in a 5x7 km systematic grid. The inventory is based on the generation of a first measurement cycle for permanent sampling plots covering 9.38 million hectares of native forest between the Coquimbo and Magallanes regions, completed in the 2001 – 2010 period, together with a second yearly basis measurement cycle under the partial replacement system with support from growth projections.

GHG data and information consolidation and integration

The described inputs are integrated into geospatial relational databases associated to spreadsheets, which pick up and systematize information about activity data and emission factors following a structure in accordance with the REDD+ activities.

³³ SOP 3 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_03_MR4.zip

³⁴ CO2 maps are available in <https://plataforma.encrv.cl/static/erpa/mr4/mapas/CO2-MR4.zip>, SOP SOP_05 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_05_MR4.zip SOP_06 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_06_MR4.zip; Auxiliary methodology presentation: https://plataforma.encrv.cl/static/erpa/mr4/sop/20260528_metodo-degradacion-bm.pptx

DCCSE is responsible for the consolidation of information, integration, emissions and captures estimation for REDD+ activities, being implemented by the MRV Monitoring, Reporting and Verification team. The use of semi-automated tools has the main goal of minimizing errors, increasing result consistency and transparency through the association between spreadsheets and PostgreSQL databases. This process also adds improvements concerning result check and update times.

The flow of information for the integration and execution of the calculation is based on the spreadsheets summarizing estimate results divided by REDD+ activities, which include different procedures attached to this document.

On the PostgreSQL database server, the main and auxiliary NFMS information, land use change maps, carbon content map and estimate parameters are loaded. Change map vectorial coverages are used in .gdb formats, while rasters data are integrated from map associated .dbf files.

Information entry to the database is supported by geographic and topologic validation rules, data attributes and content, to avoid subsequent errors during estimations or inconsistencies in the results. Data is repaired, corrected, and prepared for integration during these validations. Among all the processes being run, one of the most important tones is the estimation of surfaces per REDD+ activities, equivalent to activity data.

Finally, the data uploaded to PostgreSQL interacts with Excel to run the estimation process. This connection takes place through the ODBC Open Database Connectivity connector. The data is then entered into the excel spreadsheets where result estimation is run.

Systems and processes that ensure the accuracy of the data and information

The NFMS has processes established to ensure the accuracy of information, which also contribute to improving the accuracy, transparency, integrity, consistency, and comparability of estimations conducted.

Land use change maps quality control

The quality control process for land use change maps has the main objective of identifying discrepancies and inconsistencies in the results. Considering a semi-automated methodology where some stages are executed through programming, it is necessary to perform checks on the end product.

Quality control has been developed by DCCSE to be applied to the products delivered by the DM about land use change maps and is mainly focused on detailed map database and attribute reviews, along with layer geometry. Once discrepancies have been identified, they are submitted to the team responsible for their resolution, and then it must be verified if such discrepancies still remain. It is also necessary to document all methodological steps applied, in such a way that a record of continuous improvement is established.

Methodological protocol for the development of land use land use change maps in Native Forests³⁵

The objective of this protocol is to describe procedures, inputs, data sets and methodological steps needed to generate thematic cartography and statistical reports at the technical level on land use extension, distribution and coverage changes from the digital processing of satellite images, to allow for their replication and reconstruction.

Some of its specific objectives are:

- Establish a methodology for the evaluation of land use and land use changes in Native Forests with biennial frequency; however, for this last monitoring report, the temporal extent was reduced to one year.
- Generate use and change (directionality) coverages for Native Forest land use in the Maule, Ñuble, Biobío, Araucanía, Los Ríos and Los Lagos regions.

Protocol for the development of carbon stock, flux and degradation maps in forest remaining forest³⁶

The forest degradation methodology is based on the integration of satellite information provided by CONAF and the national forest inventory plots. The use of satellite data must guarantee necessary adjustments for the application of the degradation algorithm. This process is semi-automated by using multi pixel mosaics downloaded from Google Earth Engine. The protocol establishes the requirements of spatial information, dasometric information and data processing needed for calculations.

³⁵ For more information view footnotes 36-37-38-39

³⁶ For more information view footnotes 36-40-41

The application of this process results in thematic maps that combine the information of parcels which information is known, then spatially intersected with state variable and spectral information data.

Uncertainty Estimation for Land Use Land Use Change Maps³⁷

The main way to estimate accuracy of land use land use change maps is the comparison between the results of the sorting conducted on reference maps and observations as sampling plots. The factors that influence such estimation are sampling design and the size of the map accuracy and precision assessment sample. Errors from changes in land uses and sub – uses are calculated by following the Guides on Good Practices for the estimation of use change accuracy described in Olofsson et al (2013).

Chile has a protocol that allows to compare land use change map results to high resolution images through Collect Earth. Some of its functions and use steps are:

1. Generate a pre-sampling by land use change strata.
2. From the results of the pre-sampling, the tool generates one sampling per class that meets the guidelines described in the Map Accuracy Reports (Maximum global error) and as in pre-sampling, this tool can be used in the Collect Earth tool where a group of expert interpreters assess the initial and final uses of the period according to IPCC classes.
3. The software uses the sampling results to calculate uncertainty at the general and use change/region class level, along with details of emission and commission errors for each map.

Geographic data validation for calculating results

Results estimation is implemented from geographic data of carbon and land use change maps. To validate such data, a process with the aim of ensuring the data meets topological conditions has been developed.

Data geometry is validated in others, as it is fundamental for spatial analysis since errors detected by validation codes must be fixed before integration and calculation.

Aside from this and to reduce processing time for millions of records, an index structure for improving database performance has been developed. These indexes are applied to non-spatial values from the land use change map.

Applying a checklist to activity data

NFMS has a process for ensuring information quality and consistency, which consists in applying checklists to the results of activity data obtained from the final integration and calculation tools. The process is applied by DCCSE, with the aim of having informed surfaces completely consistent according to each REDD+ activity and region informed.

The verification seeks to ensure consistency between the surface reported for each activity and the official surface of each region, through two revisions:

- Total sum of REDD+ activity surfaces per region.
- Consistency between the surfaces reported between two periods.
- The process is applied during the integration of final calculation results and in case of finding inconsistencies, integration must be stopped, and input data reviewed. This process does not involve a formal protocol or validation documents, as it is a process for the internal validation of the presented results.

Design and maintenance of the Forest Monitoring System

The NFMS has been designed and structured on the institutions related to Chilean forestry resources and the processes conducted by each institution, responsible for use change maps, degradation maps and forest inventory plots, and the GHG National Inventory of Chile.

Its design has a gradual approach, starting with a reference level at subnational scale and therefore its construction has been on a step-by-step basis, with the goal of advancing towards the national scale monitoring of forestry regions.

³⁷Link to SOP4: https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_04_MR4.zip.

Regarding NFMS maintenance, the main activities by each institution that allow continuing the development of necessary inputs and methodologies for guaranteeing reporting on forest status in a climate change context considering continuous improvement elements are described below:

- CONAF: is responsible for implementing native forest registries through the DM. Also, based on international commitments on climate change, it has assumed the responsibility to develop biennial land use change national maps that contribute to ensure reporting on climate change matters and results – based payment projects.
- INFOR is responsible for continuing the measurements supported by the Chilean GHG reports, both from REDD+ and the GHG National Inventory. On the other hand, as a member of the Agriculture, Forestry and Other Land Use (AFOLU) like CONAF, INFOR remains close to the ERPA associated INGEI and REDD+ climate change commitments of Chile and maintains the commitment of executing the necessary processes for estimating degradation of the two next monitoring milestones, in accordance with the agreement.

Systems and processes that support the Forest Monitoring System, including Standard Operating Procedures and QA/QC procedures

The processes that support the FNMS are described in the next SOPS:

- **SOP01 Satellite mosaic elaboration (includes satellite image selection)³⁸**

This document is a guideline to select and download multi pixel satellite mosaics to monitor land use and land use change and to evaluate forest degradation in NFMS. The document indicates searching windows of images and pixels with the minimum required quality to be included in the mosaic elaboration.

- **SOP02 LULUCF Maps elaboration³⁹**

SOP 2 indicates the technical procedure to detect gain and losses in forest land, for the land use change monitoring, through the Multi Index Integrated Change Detection MIIICA method application.

- **SOP03 Standardization and quality control protocol for land use change maps⁴⁰**

Standards or guidelines are established and used as compliance rules to standardize formats regarding historical and use change map, which contain information and traceability by region of land use, sub – use, structure, forest type, forest subtype, change and type of change for each evaluated period.

- **SOP04 Uncertainty assessment on land use change maps⁴¹**

Correspond to standard operating procedures in writing containing detailed protocols to be followed in order to correctly attribute land uses, training procedures for interpreters/evaluators and develop a re-photointerpretation process for a series of sample units to guarantee that standard operating procedures are correctly implemented and identify areas of improvement through the use of a Platform of Uncertainty.

Visual Interpretation Classification Manual:

Written manual created as a practical, step by step tutorial meant for interpreters/evaluators that participate in uncertainty estimation processes.

- **SOP05 Forest carbon flux estimation assessment⁴²**

Develops the methodological protocol for estimating carbon fluxes in forest lands that remain as such, by integrating satellite mosaics with data series from forest inventory plots. These data are combined to determine the degradation or increase of carbon stock in permanent forest.

³⁸ SOP_01 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_01_MR4.zip

³⁹ SOP_02 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_02_MR4.zip

⁴⁰ SOP_03 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_03_MR4.zip

⁴¹ SOP_04 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_04_MR4.zip

⁴² SOP_05 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_05_MR4.zip

- **SOP06 Field operation manual**⁴³

The manual details the procedures and methods to be used in the field data collection for the inventory of the resources comprised in the native forest ecosystems of the country. It includes the chapters that deal with the data and information referring to the field brigades and the conglomerates, the plots and the trees, including the variables that characterize the development environment from an ecosystem perspective. As such, it aims to rescue data and information from the different components of forest ecosystems.

- **SOP07 Forest fire polygons**⁴⁴

This document establishes the procedure for the elaboration of forest fire polygons, operational, post and final fire, as an input for the evaluation of the damage caused by these at the level of plant formations, populated centers and strategic infrastructure.

Role of communities in the forest monitoring system

The role of communities in the NFMS is connected to activities previously presented during the 2016 report, which has extended until today in this regard. In such a context, communities actively participate in the system in terms of complaints on fire related issues, where territorial committees led by GEPRIF, and its Forest Fire Prevention Department have been established. The previous report mentioned that the use of fire as a tool in agriculture and silviculture activities is regulated by Decree No. 276 of MINAGRI, enacted in 1980. This decree regulates and establishes norms on technical and administrative procedures for fire use, mainly for agriculture or silviculture harvest residues disposal. When this decree was issued, 45% of all forest fires in Chile were generated using fire for disposing of forestry and agriculture residues without adequate planning or control measures. Nevertheless, the current situation reveals that only 6% of fires are caused due to agricultural and/or forest burning.

CONAF's online platform for the Burn Assistance System ([SAQ](#), acronym in Spanish) facilitates procedures and processes when members of the community need to use fire, where the user conducting the controlled burning can obtain a voucher for his burn notification without having to visit a CONAF office in person. In this regard, CONAF has provided capacity building and trained communities so their users can use the system effectively and independently through the national territory.

On the other hand, and on this same point about controlled burning notifications, members of the community can also actively participate in complaint procedures that lead to fire use oversight, a situation made possible by the close cooperation between CONAF and the national police (Carabineros de Chile). In this context, initiatives such as these encourage the communities to actively participate in protecting their lands by establishing the already mentioned forest oversight committees, which for example have been developed in Maule, Biobío and Araucanía regions.

In parallel, illegal logging is another aspect related to the role of communities in NFMS. For this purpose, CONAF also has a mechanism for receiving citizen complaints via website through its third-party complaint form for alleged violations of Forestry Law of Chile available in the next link <https://oficinavirtual.conaf.cl/denunciaTerceros/index.php?x=1>, when there is information of any acts where a violation of the Forest Law of Chile has taken place.

Among the main complaints that can be made are: i) Unauthorized cutting of forest, ii) Cutting, elimination or stripping of Xerophytic formations without a Work Plan, iii) Non-compliance with technical studies and iv) Transportation or collection of primary products from the native forest.

⁴³ SOP_06 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_06_MR4.zip

⁴⁴ SOP_07 Available in https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_07_MR4.zip

For this, CONAF oversees verifying the truthfulness of the information being provided through the complaint, following a site inspection process as final verification and setting in motion the various legal actions that are required to be filed against the alleged offender. Afterwards, CONAF sends a document to the complainant's address to notify him/her about the outcome of the complaint and the law enforcement conducted by CONAF, informing the complainant if there was a breach of the existing forest legislation and any legal measures adopted by CONAF if required.

As previously mentioned in Reports 1, 2 and 3 the mechanisms described below remain unchanged and continue to support community involvement in forest monitoring and legal enforcement efforts. In relation to controlled burn notifications, community members can actively contribute by filing complaints that help regulate fire use. This is possible thanks to the collaboration between CONAF and Chile's national police, Carabineros de Chile. These efforts foster local communities to take part in protecting their lands, as seen through the creation of forest oversight committees in regions such as Maule, Biobío, and La Araucanía.

Likewise, illegal logging is another key area where communities participate within the framework of the National Forest Monitoring System (NFMS). In this regard, CONAF offers an online platform that allows citizens to report suspected violations of the Chilean Forestry Law via a third-party complaint form, accessible at the following link: <https://oficinavirtual.conaf.cl/denunciaTerceros/index.php?x=1>.

Frequent types of complaints include: (i) Unauthorized tree felling, (ii) Clearing or degradation of xerophytic vegetation without an approved Work Plan, (iii) Failure to comply with technical study requirements, and (iv) Transport or extraction of primary products from native forests. Once a complaint is submitted, CONAF is responsible for assessing the validity of the information, including conducting an on-site inspection as part of the verification process. Where applicable, legal action is initiated against the alleged violator. Finally, CONAF sends a written notice to the complainant informing them of the results of the investigation, any detected legal infractions, and the enforcement measures applied.

Use of and consistency with standard technical procedures in the country and the National Forest Monitoring System.

The approach for the measuring, monitoring, and reporting established for emissions and captures accounting is completely consistent with the procedures established by Chile for the National Forest Monitoring System, which has been developed and implemented in accordance with the technical requirements established by the UNFCCC and the Carbon Fund. It has also been subject to a technical evaluation by the Green Climate Fund panel of experts during 2019, for the results – based payment phase. The NFMS is part of the ENCCRV Monitoring and Measurement System (SMM), which besides forest monitoring is also designed to monitor neutral land degradation elements, safeguards and co – benefits.

The SMM of the ENCCRV has information collection processes and systems that act as a basis for the NFMS. These correspond to land use change maps based on a Native Forest Cadastre for land use change activity data, the National Forest Inventory for the estimation of forest degradation, the National Wood Fuel and Carbon Inventory and the Forestry Administration and Control System (SAFF) and the Territorial Information System (SIT). These systems allow the gathering, visualization, query, and maintenance of information related to land use in Chile.

In 2023, Chile submitted a new Reference Level⁴⁵, officially assessed in 2024, which considered an expansion of the monitoring area, incorporating 12 of the country's 16 regions, from Coquimbo region to Magallanes region. This Reference Level includes activity data related to deforestation, degradation, and conservation for the 2001–2013 period. Additionally, in 2024, a second Technical Annex of Results⁴⁶ was submitted and is currently under review by the Technical Assessment of the Technical Annexes for REDD+ Results (TATR). This annex includes the monitoring

⁴⁵ https://redd.unfccc.int/media/nref_nrf_nacional_englishversion_dec2023.pdf

⁴⁶ https://unfccc.int/sites/default/files/resource/CHL_REDD_2024.pdf

periods 2018–2019 and 2020–2021 for the territory including from the Coquimbo Region to Magallanes Region and likewise maintains the same methodological approaches established under the ERPA.

2.2 Updates to the monitoring approach

Intentionally left blank because there are no updates to the monitoring approach in this monitoring period.

2.3 Measurement, monitoring and reporting approach

The approach applied by the country is based on the preparation of land use / land use change maps, from which the stable and changing forest areas are defined for both the reference period and the period of follow-up. The first step in the process is the preparation of the land use change map and the second is the preparation of the carbon stock map, for monitoring degradation. These are the most important points in the process.

Then, for the land use change activities, the NFMS applies the gain losses estimation approach, and the stock change approach for forest remaining forest activities. For both, the emission factors come from the national forest inventory data.

2.3.1 Line Diagram

A line diagram outlining the important monitoring points, parameters monitored and the integration process according to the two areas of result estimation is shown below. In addition, specific diagrams according to REDD + activity are presented in the text. The next figure shows, in a summarized way, the sources of information for the generation of emissions and absorption estimations.

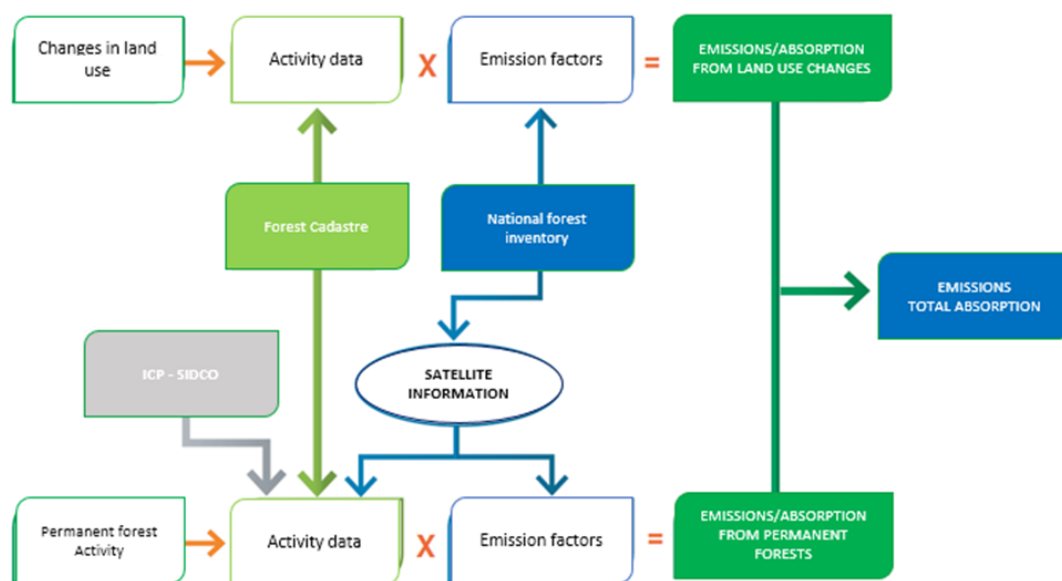


Figure 2. Sources of information for the generation of forest carbon emissions and absorption estimations.

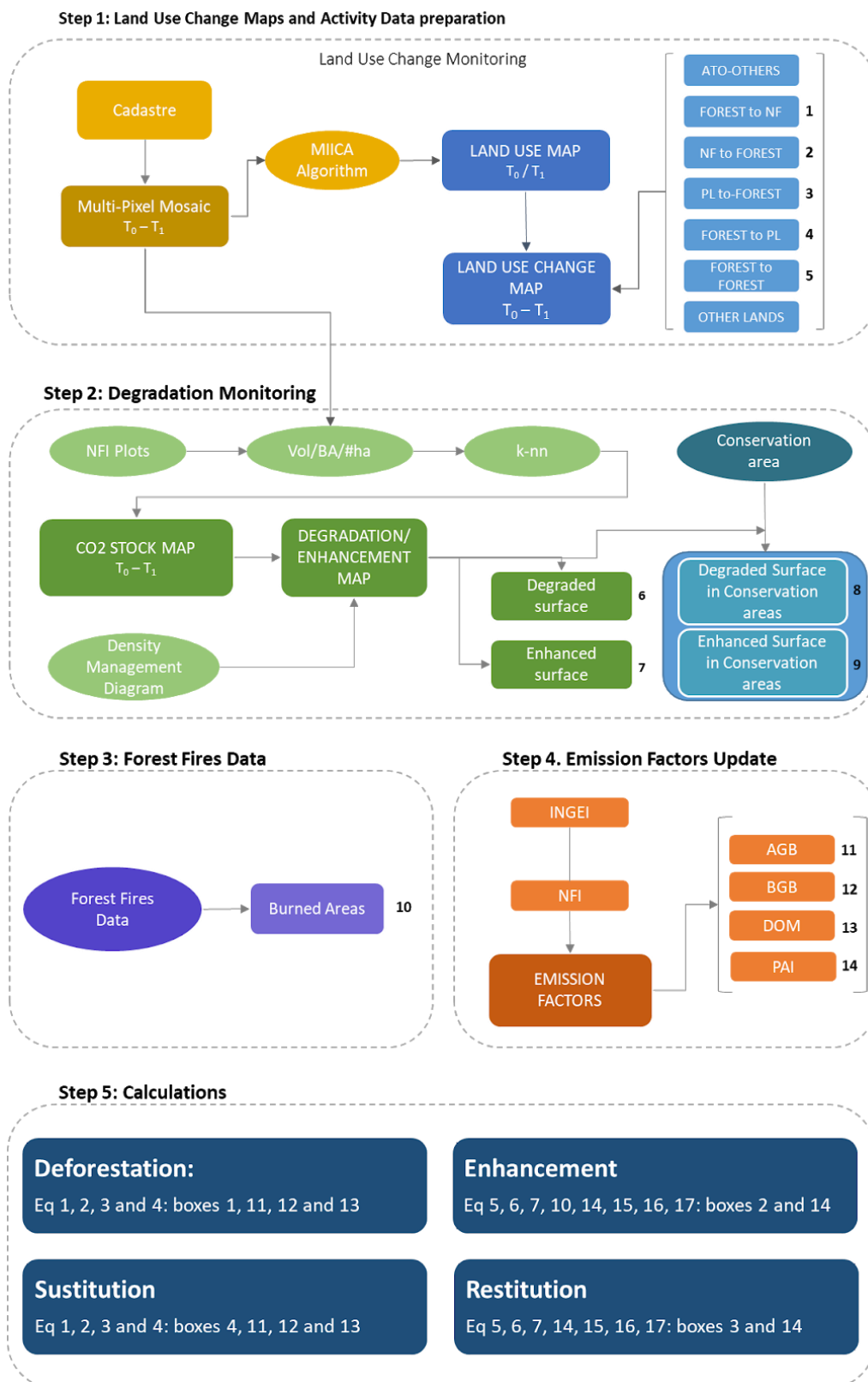


Figure 3. Methodological diagram of the Measurement and Monitoring process.

2.3.2 Calculation

Removals and emissions are estimated in the NFMS by applying the IPCC 2006 equations, in accordance with the methodology applied by INGEI. The equations are the same ones presented in the ERPD, both for the reference and monitoring period 2024. They are detailed below by REDD+ activity:

Deforestation ⁴⁷

The methodology for calculating deforestation is based on the IPCC 2006 equations for forest lands converted into other lands, which are also used in the INGEI for calculating emissions from forests converted into other land uses. Above ground biomass, below ground biomass and DOM reservoirs are included.

Equation 1. Estimation of Deforestation [Adapted from Eq. 2.15 of IPCC (2006)]

$$FREL_{Def} = \frac{\sum_t^n \Delta C_{B_{t,Def}}}{p} * \frac{44}{12}$$

Where:

- Def = annual average carbon stock losses in forest lands converted into non – forest during the reference and monitoring period, in tonnes CO₂e year⁻¹.
- CB_{t, Def} = carbon stock change in forest lands converted into non – forest in year *t* of the reference and monitoring period, in tonnes C.
- *p* = years of the reference and monitoring period.
- 44/12 = factor for converting carbon into equivalent carbon dioxide, tonnes CO₂e ton C⁻¹.

Tier 3 of the IPCC methodology is used in estimations of emissions from deforestation, as carbon stocks in land uses before and after conversion are specific to Chile, with conversion areas being broken down by original land cover type (Sidman et al., 2015).

As recommended in IPCC (2006), Equation 2.15 is used to calculate annual carbon stock changes in wooded lands converted into other land use categories (in the case of deforestation, any forest area converted into non – forest)

Equation 2 [Eq. 2.15 of IPCC (2006)]

$$\Delta C_{B_{t,Def}} = \Delta C_{G_t} + \Delta C_{CONVERSION_t} - \Delta C_{L_t}$$

Where:

- $\Delta C_{B_{t,Def}}$ = annual carbon stock change in forest lands converted into non – forest in year *t* under deforestation activity (Def), in tonnes C.
- ΔC_{G_t} = annual increase in carbon stocks due to growth in forest lands converted into non – forest in year *t*, tonnes C.
- $\Delta C_{CONVERSION_t}$ = initial change in biomass carbon stocks in forest lands converted into non – forest in year *t*, in tonnes C.
- ΔC_{L_t} = annual loss of biomass carbon stocks due to wood harvesting, firewood extraction and disturbances in forest lands converted into non – forest in year *t*, in tonnes C.

⁴⁷ Excel spreadsheet available in:

https://plataforma.enccrv.cl/static/erpa/mr4/deforestacion/Herramienta_Deforestacion_NR2_MR4_v022.xlsx

In this equation, changes in carbon stocks from gains and losses due to any activity other than conversion (ΔC_G and ΔC_L) to net gains and losses directly due to conversion ($\Delta C_{CONVERSION_t}$; in case of deforestation, as it generally results in a negative value due to the loss in forest carbon stocks) to calculate total changes in carbon stocks.

The NFMS of Chile includes ΔC_G , which represents carbon captures for non – forest uses after conversion (agricultural, urban, others). This variable will be given a value of zero, as it does not impact the deforestation loss analysis.

Equation 3 [Eq. 2.16 of IPCC (2006)]

$$\Delta C_{CONVERSION_t} = \sum_i \left\{ (B_{AFTER_i} - B_{BEFORE_i}) * \Delta A_{TOOTHERS_{i,t}} \right\} * CF$$

Where:

$\Delta C_{CONVERSION}$ = initial change in biomass carbon stocks in forest lands converted into non – forest, in tonnes C year⁻¹.

B_{AFTER_i} = existence of biomass in non – forest land use type i after conversion, in dry biomass tonnes per hectare.

B_{BEFORE_i} = existence of biomass in forest type before conversion, in dry biomass tonnes per hectare.

$\Delta A_{TOOTHERS_{i,t}}$ = forest type i area converted into non – forest in year t , in ha.

CF = carbon fraction of dry biomass, in tonnes of carbon by tons of dry biomass. 0.47 is the default value as per IPCC AFOLU guidelines 2006, Table 4.3.

In the case of deforestation, these two equations can be represented with two essential inputs ($\Delta A_{TOOTHERS_i}$), frequently called activity data (AD) and the amount of carbon stocks emitted due to conversion ($B_{AFTER_i} - B_{BEFORE_i}$), frequently called emission factors (EF). Parameters B_{AFTER_i} and B_{BEFORE_i} only include above and below ground biomass, so DOM is included by adding parameter ΔC_{DOM} calculated according to the following equation:

Equation 4 [Eq. 2.23 of IPCC (2006)]

$$\Delta C_{DOM_t} = \frac{(C_n - C_o) * A_{on_t}}{T_{on}}$$

Where:

ΔC_{DOM_t} = DOM carbon stock change in year t , tonnes C.

C_n = dead wood and DOM carbon stocks in non – forest land use after conversion, ton C year⁻¹.

C_o = dead wood and DOM carbon stocks in forest before conversion into non - forest, ton C year⁻¹.

A_{on_t} = area converted from forest into non – forest in year t , hectares.

T_{on} = time period for the forest into non – forest transition.

In this equation A_{on} corresponds to activity data, or $A_{TOOTHERS_i}$, according to the parameter of previously described in Equation 3. In order to simplify accounting, DOM emissions will be counted in the year of conversion (meaning T_{on} is supposed to have a value of 1).

The process for calculating emissions from deforestation is summarized in the following diagram:

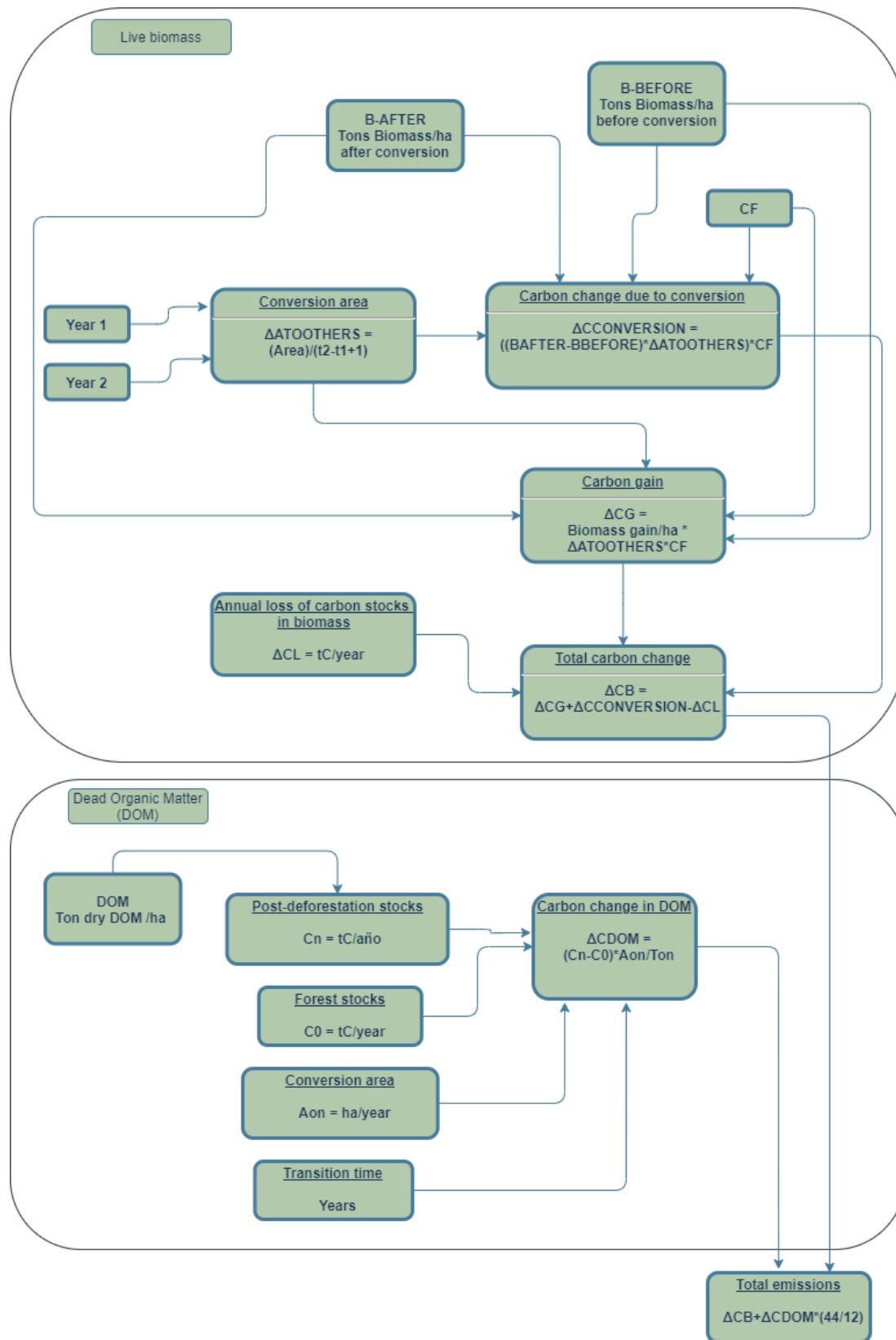


Figure 4. Step by step diagram for estimating emissions from deforestation.

Degradation from substitution⁴⁸

The equation used for estimating deforestation is applied to estimate degradation in native forests converted into plantations, as it is assumed that for a plantation to be established, all carbon content in the preceding native forest must be reduced to zero. Equation 1 is used to calculate the reference and monitoring period in CO₂e. Step-by-step diagram summarizing the process is presented below:

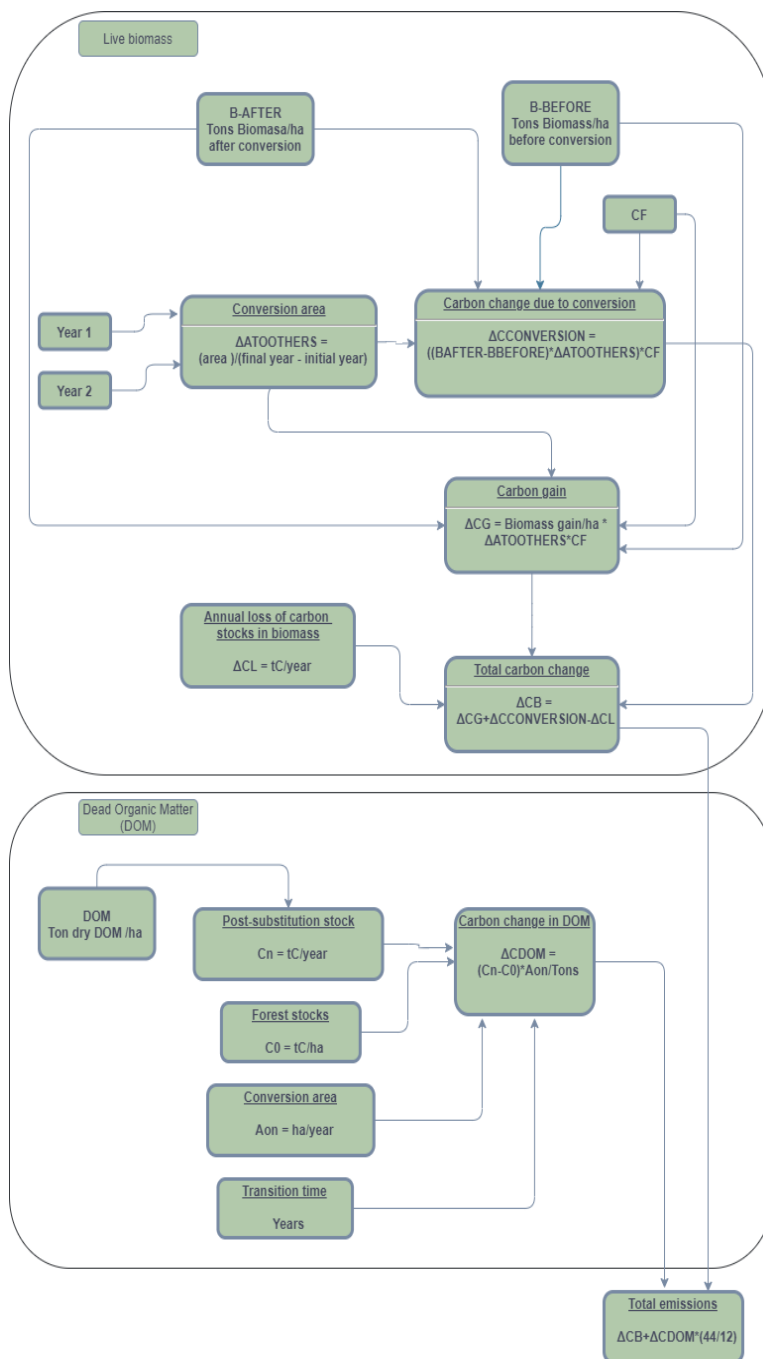


Figure 5. Step by step diagram for estimating emissions from Substitution.

⁴⁸ Excel spreadsheet available in:

https://plataforma.enccrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx

Forest area Restitution and carbon stock Enhancement⁴⁹

As in the other calculated activities, the methodology for enhancements in other lands converted into forests is consistent with the methodology used in INGEI which is based on equations 2.9, 2.10 and 2.15 of IPCC (2006).

The general equation corresponding to Tiers 2 and 3 of IPCC (2006) is 2.15, used for calculating annual changes in carbon stocks in above and below ground biomass (the only reservoirs included in enhancement estimations) and lands converted into other land uses (In this case, non – forest into forest):

Equation 5 [Eq. 2.15 of IPCC (2006)]

$$\Delta C_{B_t,ANFF} = \Delta C_{G_t} + \Delta C_{CONVERSION_t} - \Delta C_{L_t}$$

Where:

- $\Delta C_{B_t,ANFF}$ = carbon stock enhancements in year t , from non – forest lands converted into forests during the reference period, under the stock enhancement activity (A), in tonnes C.
- ΔC_{G_t} = carbon stock enhancement due to growth in non – forest lands converted into forest year t , in tonnes C.
- $\Delta C_{CONVERSION_t}$ = initial carbon stock change in non – forest lands converted into forests in year t , in ton C.
- ΔC_{L_t} = annual carbon stock decrease due to wood harvesting, firewood extraction and disturbances in non – forest lands converted into forest in year t , in ton C.

The estimations for enhancements assume ΔCL to be zero, due to the lack of sufficient data to quantify losses in non – forest areas converted into forest. Equation 2.16 of IPCC (2006) is used for the parameter $\Delta C_{CONVERSION_t}$:

Equation 6 [Eq. 2.16 of IPCC (2006)]

$$\Delta C_{CONVERSION_t} = \sum_i \{ (B_{AFTER_i} - B_{BEFORE_i}) * \Delta A_{TOOTHERS_{i,t}} \} * CF$$

Where:

- $\Delta C_{CONVERSION_t}$ = initial carbon change in non – forest lands converted into forest in year t , ton C.
- B_{AFTER_i} = biomass stocks in forest type i immediately after conversion, ton m.s. ha⁻¹.
- B_{BEFORE_i} = biomass stocks in land type i before conversion, ton d.m. ha⁻¹.
- $\Delta A_{TOOTHERS_{i,t}}$ = non – forest land use surface converted into forest in year t , ha.
- CF = carbon fraction in dry matter, ton C (ton m.s.)⁻¹ 0.47 is the default value as per IPCC AFOLU guidelines 2006, Table 4.3.

For parameter ΔCG (enhancement due to forest growth), INGEI uses IPCC 2006 Equation 2.9 for a Tier 2 – 3 calculation. Nevertheless, INGEI only uses it for lands converted into forest in the year of conversion.

Equation 2.9 of IPCC (2006) calculates annual carbon enhancements. But Equation 6 [(Eq. 2.16 of IPCC (2006))] does not consider captures converted in previous years that keep accumulating in strata “ i ”. So, it is necessary to modify equation 2.9 of IPCC (2006) as follows to achieve a correct accounting:

⁴⁹ Excel spreadsheet available in:

https://plataforma.encrcv.cl/static/erpa/mr4/aumento/Herramienta_Aumentos_NR2_MR4_v033.xlsx

Equation 7 [adapted from Eq. 2.9 of IPCC (2006)]

$$\Delta C_{G_t} = \sum_i \sum_x (A_{i,x} * G_{TOTAL_i} * CF)$$

Where:

- ΔC_{G_t} = carbon stock enhancement in year t , due to growth in non – forest lands converted into forest type i during the reference period, in ton C.
- $A_{i,x}$ = Area converted into forest i in year x of the reference period, in ha.
- G_{TOTAL_i} = annual average biomass growth in non – forest lands converted into forest type i , ton d. m. ha⁻¹ year⁻¹.
- CF = dry matter carbon fraction, ton C (ton d.m.)⁻¹ · 0.47 is the default value as per IPCC AFOLU guidelines 2006, Table 4.3.

Equation 7 considers that for calculating ΔC_{G_t} in year t , it is necessary to add captures from areas converted in each year x before year t in the reference and monitoring period, to captures from areas converted in year t . In case a forest reaches adulthood and stops capturing CO₂ from the atmosphere, it should be removed from enhancement accounting. Nevertheless, this is not supposed to happen during the reference and monitoring period.

The following diagram represents step by step the calculation of removals due to increases from non-forest to forest and restitution (plantation to native forest). In the lower part, the number of years considered in the reference period is represented (13 in total), indicating that forests grow cumulatively from year 1 to year 13.

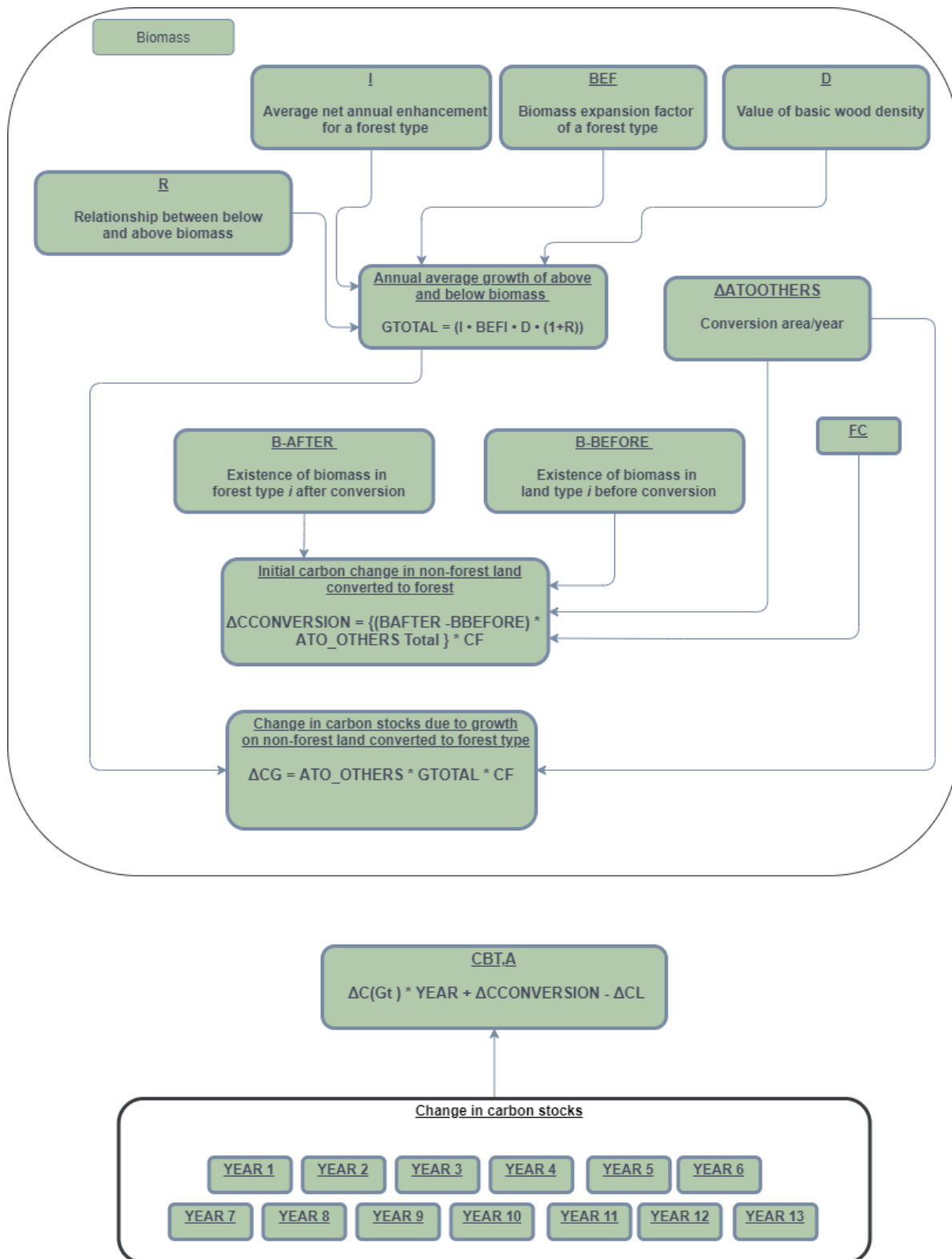


Figure 6. Step by step diagram for estimating removal from Enhancement.

Forest Remaining Forest

Degradation ⁵⁰

Equation 2.8(a) of IPCC (2006) is used to estimate changes in carbon stocks in forest lands that remain as such due to degradation:

Equation 8 [Eq. 2.8 of IPCC (2006)]

$$\Delta C_{B_{t,DegFF}} = \frac{(C_{t_2} - C_{t_1})}{(t_2 - t_1)}$$

Where:

- $\Delta C_{B_{t,Deg}}$ = annual carbon stock change in forest lands that remain as such considering total area under degradation activity (*DegFF*), ton C.
- C_{t_2} = total forest carbon in year t_2 , ton C.
- C_{t_1} = total forest carbon in year t_1 , ton C.

The equation is applied for the reference level accounting described in Bahamondez *et al.* (2009)⁵¹. This methodology accounts for carbon stocks at different points in time, where the difference in carbon stocks in forest lands is considered degradation in case of losses. On the other hand, INGEI uses a loss – gain method, Equation 2.7 of IPCC (2006) instead of the stock difference method found in IPCC 2006 equation 2.8, where tabular data from INFOR is integrated to estimate volume extracted through selective logging, INFOR and MINENERGIA firewood statistics, and CONAF tabular data for the surface of fires in native forest and forest plantations. According to national experts, firewood extraction data are not very robust or representative of degradation in a comprehensive manner. The methodology used in NFMS allows to achieve Approach 3 results, spatially explicit data, and is based on robust and independent sources of information.

IPCC equation 2.8(b) is used to calculate carbon stocks in the initial and final moments of the reference period (C_1 and C_2 in Equation 8). The country applies a summarized version of IPCC eq 2.8, where the term EF considers ($V * BCEF * (1+R)$), portion of the equation that is previously calculated in the thematic map, the elements of Volume, Conversion Factor and expansion of biomass and relationship stem root):

Equation 9 [Adapted from Eq. 2.8 of IPCC (2006)]

$$C_t = A_{Deg} * EF * CF$$

Where:

- $C_{t,i}$ = total forest carbon in year t , ton C.
- A_{Deg} = degradation area in forest that remains as such, ha.
- EF = carbon stocks in forest that remains as such, ton biomass ha⁻¹.
- CF = carbon fraction, t carbon t biomass⁻¹. 0.47 is the default value as per IPCC AFOLU guidelines 2006, Table 4.3.

⁵⁰ Excel spreadsheet available in:

https://plataforma.enccrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx

⁵¹ Bahamóndez, C., Martín, M., Müller-Using, S., Rojas, Y., Vergara, G., 2009. Case Studies in Measuring and Assessing Forest Degradation: An Operational Approach to Forest Degradation. (Forest Resources Assessment Working Paper). Forestry Department, Food and Agriculture Organization of the United Nations.

Stock Enhancement in Forest remaining forest ⁵²

IPCC (2006) equation 2.8 was used to calculate annual stock enhancements:

Equation 10 [Eq. 2.8 of IPCC (2006)]

$$\Delta C_{Bt,AFF} = \frac{(C_{t_2} - C_{t_1})}{(t_2 - t_1)}$$

Where:

- $\Delta C_{Bt,AFF}$ = annual carbon stock change in forest lands that remain as such, considering total area under stock enhancement activity (*DegFF*), ton C year⁻¹.
- C_{t_2} = total forest carbon in year t_2 , ton C.
- C_{t_1} = total forest carbon in year t_1 , ton C.

Carbon contents in year t_1 (2001) and t_2 (2010) were obtained from the results of applying the methodology that allows to identify areas that were below threshold or line B at the start of the reference and monitoring period.

Forest Conservation⁵³

As explained in previous sections, emissions and removals for Forest Conservation is estimated by adding emissions from forest degradation in forest remaining forest and absorptions from the restoration of degraded forests in forest areas under formal conservation processes. The country applies a summarized version of IPCC eq 2.8, where the term EF considers ($V * BCEF * (1+R)$), portion of the equation that is previously calculated in the thematic map, the elements of Volume, Conversion Factor and expansion of biomass and relationship stem root):

Equation 11 [Adapted from Eq. 2.8(a) of IPCC (2006)]

$$\Delta C_{Bt,ConFF} = \Delta C_{Bt,AFF} - \Delta C_{Bt,DegFF}$$

Where:

- $\Delta C_{Bt,C}$ = carbon stock annual change in forest lands subject to formal conservation processes in year t , in ton C.
- $\Delta C_{Bt,AFF}$ = annual changes in carbon stocks due to recovery of degraded forests in areas subject to formal conservation processes, in ton C year⁻¹.
- $\Delta C_{Bt,DegFF}$ = annual changes in carbon stocks due to forest degradation in forest lands subject to formal conservation processes, in ton C year⁻¹.

In the following diagram the summary of steps for estimating emissions and captures in forest remaining forest is presented, both for increases, degradation and conservation. As can be seen, the conservation areas correspond to a part of the forest remaining forest that is under protection. It is defined by the geographic limit that delimits the area.

⁵² Spreadsheet available in:

https://plataforma.encrcv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx

⁵³ Spreadsheet available in:

https://plataforma.encrcv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_Conservacion_NR2_MR4_v17.xlsx

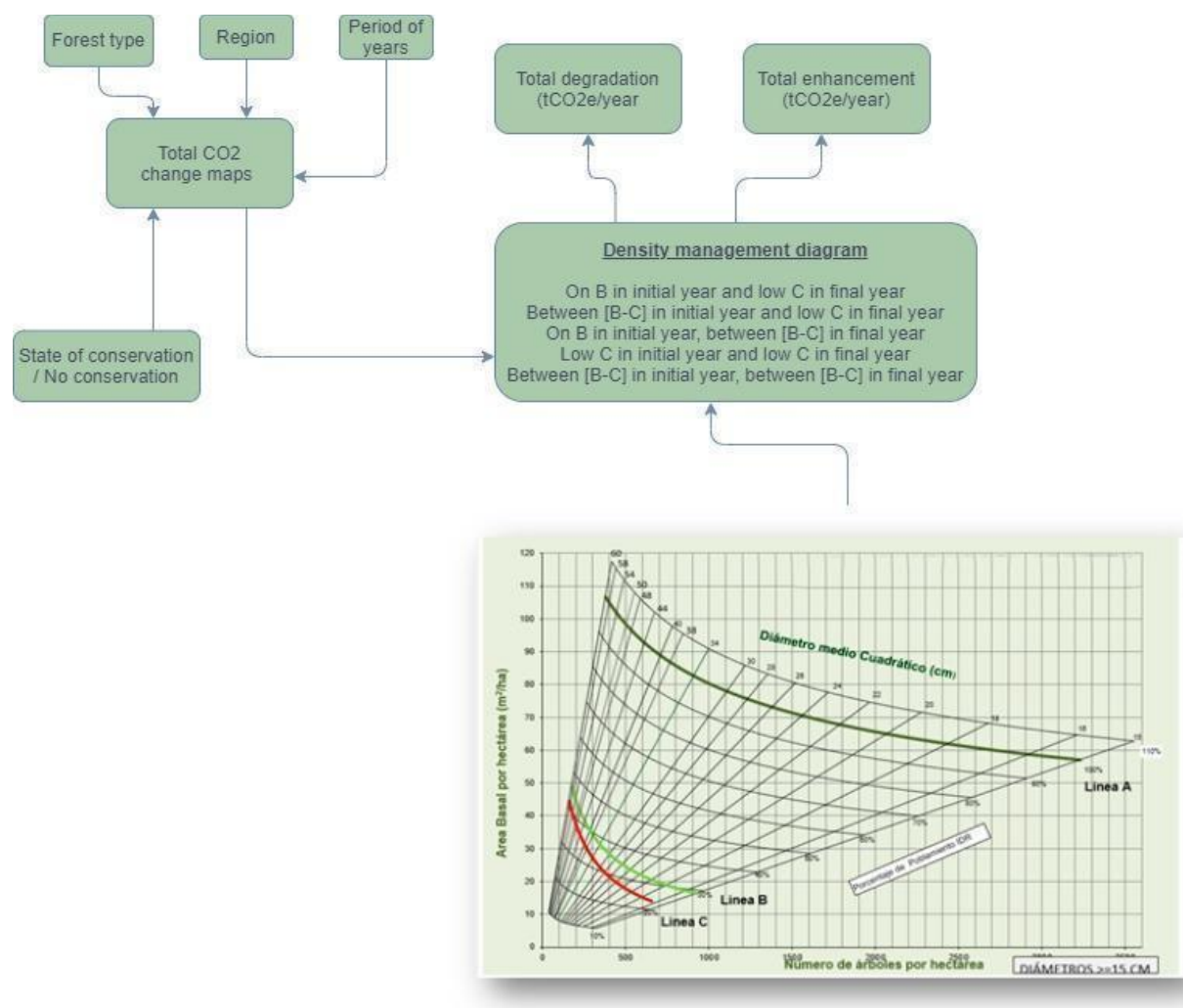


Figure 7. Step by step diagram for estimating emissions and removals from forest remaining forest.

Non -CO₂ emissions from Forest Fires⁵⁴

The methodology by Bahamondez et al. (2009) estimates CO₂ emissions in forest remaining forests. Therefore, Equation 2.27 of IPCC (2006) is used to calculate non – CO₂ emissions from forest fires:

Equation 12 [Eq. 2.27 of IPCC (2006)]

$$L_{fire} = A * M_B * C_f * G_{ef} * 10^{-3}$$

Where:

- L_{fire} = amount of greenhouse gas emissions caused by fire, ton of each GHG gas year⁻¹
- A = burned surface, ha year⁻¹
- M_B = fuel mass available for combustion, ton ha⁻¹.
- C_f = combustion factor, no dimension. The value applied is 0.45 according to IPCC 2006.

⁵⁴ Spreadsheet available in https://plataforma.enccrv.cl/static/erpa/mr4/incendios/Herramienta_Incendios_NR2_MR4_v019.xlsx

- G_{ef} = emission factor, g kg⁻¹ of burned dry matter. Emission factors used for the equation are 4.7 for CH₄ and 0.26 for N₂O.

Equation 13 is used to convert L_{fire} into CO₂e, for Equation 12:

Equation 13

$$GEI_{fire} = L_{fire} * CF$$

Where:

- CF = conversion factor of non CO₂ gas into CO₂e, ton gas no-CO₂ ton CO₂e⁻¹. CF value is 25 for CH₄ and 298 for N₂O, according to IPCC 2006.

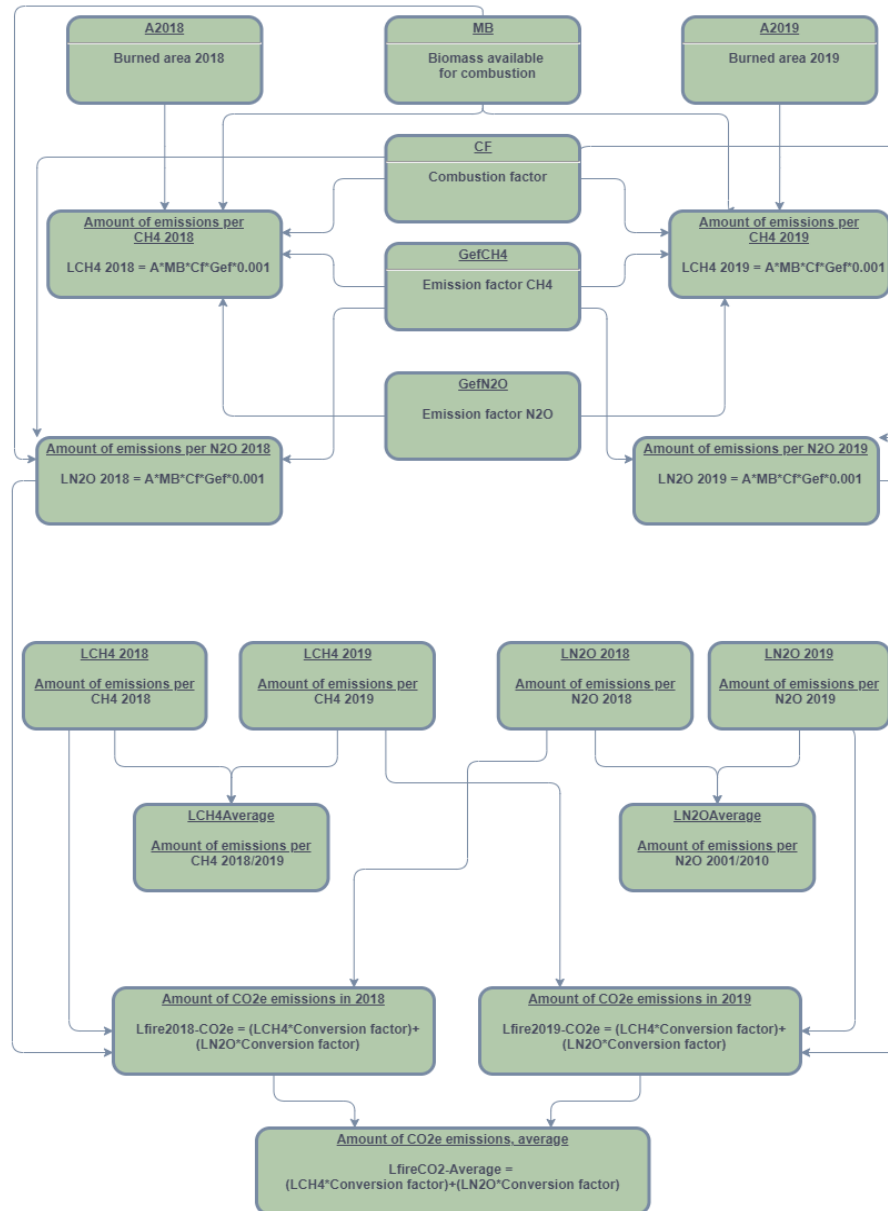


Figure 8. Step by step diagram for estimating emissions from forest fires.

Emission Factors

Deforestation

Carbon stocks before deforestation (B_{BEFORE})⁵⁵

Forest carbon stocks before deforestation were obtained from the information base of the INGEI of Chile.⁵⁶ These numbers are derived from the national forest inventory in order to reach a Tier 2 living above ground biomass estimation. Estimations are stratified by forest type to obtain carbon contents before deforestation. Information of changes in land use was updated to include forest type data. The data for the ERPA monitoring and reporting process is based on 1990-2018 NIGHG series.

Above and below ground biomasses (B_{BEFORE} in Equation 3 and 6) along with DOM (Co in Equation 4) are obtained from the GHG national inventory. Under deforestation accounting, harvested wood products (HWP) carbon stocks are supposed to be zero, due to the lack of reliable sources of data for distinguishing between HWP due to deforestation and HWP due to degradation.

Carbon stocks after deforestation (B_{AFTER_i})

INGEI uses IPCC (2006) default values for B_{AFTER_i} , but these values are supposed to be the non – forest land use growth that really corresponds to ΔCG . For FREL estimations, carbon stocks directly after deforestation in deforested lands will be assumed to be zero.

Changes in carbon stocks other than deforestation events (ΔCG and ΔCL)

Post – deforestation carbon stocks (ΔCG) are determined in one of two ways:

- Values taken from a literature review of non – forest carbon stocks, ideally studies conducted in Chile (such as Gayoso 2006). If these studies are not available, data from other regional studies (Temperate South America under similar management regimes) can be used. This is the preferred method, representing a Tier 2 approach.
- When these values are not available, IPCC (2006) default values can be used. This is the method being currently used by the INGEI but represents a Tier 1 method.

Losses due to wood harvesting, firewood extraction and disturbances (ΔCL) are supposed to be zero in deforestation areas, using the same assumption as INGEI.

Degradation from Substitution

Carbon stock estimations derived from National Inventory plots and other carbon stock studies in other land uses are utilized for the emission factors in changes from native forest into plantation. Biomass stock estimations in plantations are assumed to be zero (0), as stocks in the native forest are supposed to have been reduced to zero before the establishment of the plantation.

⁵⁵Values available in spreadsheet https://plataforma.encrcv.cl/static/erpa/mr4/deforestacion/Herramienta_Deforestacion_NR2_MR4_v022.xlsx. For better comprehension, the tab names follow the same naming convention, e.g., *MauleB-NB_NR* or *RegionB-NB_RP4*. “Maule” refers to the name of the region; “B-NB” stands for *bosque-no bosque* (forest to non-forest), which corresponds to deforestation; and “NR” stands for *Nivel de Referencia* (Reference Level) and for the monitoring periods, the only change is at the end of the tab name, which uses “RP4” to indicate *Reporting Period*. Considering this, B_{before} is the carbon stock before the deforestation, which is the sum of aboveground biomass, belowground biomass and deadwood. Is used in column N of each regional tab, both for the NR and RP4 sheets. This column is, in turn, associated with the “Tabla_LU” (table “ipa” and “ipa_mixto”) tab located within the same spreadsheet.

⁵⁶ The values of B_{before} refers to the values from own elaboration based on INGEI 2020 (series 1990-2018). https://snichile.mma.gob.cl/wp-content/uploads/2022/06/Informe_del_Inventario_Nacional_de_GEI_serie_1990-2018.pdf

Forest Surface Enhancement and Restitution

The value of B_{AFTER_i} in Equation 7 is supposed to be zero for agricultural lands and urban – industrial areas, as carbon stocks in non – forest land use converted into forest have been removed before forests are established. For natural land uses, mainly grasslands and scrubs, B_{AFTER_i} is supposed to be equal to B_{BEFORE_i} , as no clearing or cleaning processes are supposed to take place in those lands before the forest is established, but rather are naturally converted into forest without losing initial carbon stocks. Carbon stocks in B_{BEFORE_i} are equivalent to carbon stocks in non – forest land use. National or regional scientific reports such as Gayoso (2006) which have estimated carbon stocks in non – forest land uses are used for these stocks.

In Equation 7, G_{TOTAL_i} , average annual biomass growth per hectare for each forest type is calculated through Equation 14 (modified from Equation 2.10 in IPCC 2006).

Equation 14 [adapted from Eq. 2.10 of IPCC (2006)]

$$G_{TOTAL} = \sum_i (I_{Vi} \cdot BCEF_i \cdot (1+R_i))$$

Where:

- G_{TOTAL} = Average annual above and below ground biomass growth, ton d. m. ha⁻¹ year⁻¹.
- I = Annual average net increase for one forest type, m³ ha⁻¹ year⁻¹.
- $BCEF_i$ = Biomass expansion and conversion factor for the conversion of annual net volume increase into Above ground biomass growth for one forest type, tons of aerial growth (m³ of annual average increase)⁻¹.
- R = Relation between above and below ground biomass for one forest type in ton m.s of below ground biomass (ton m.s. of Above ground biomass)⁻¹.

Annual average net increase values, I , are gathered in the INGEI data set, based on data from national forest inventory, which estimates values for the following forest types: Alerce, Ciprés de las Guaitecas, Araucaria, Ciprés de la Cordillera, Lengua, Coihue de Magallanes, Roble Hualo, Roble-Raulí-Coihue, Coihue-Raulí-Tepa, Esclerófilo and Siempreverde. Equation 15 is used for calculating $BCEF_i$:

Equation 15 [From IPCC 2006 Volume 4, page 2.13]

$$BCEF_i = BEF_i \cdot D_i$$

Where:

- BEF_i = Biomass expansion factor for one forest type. This factor expands total above ground biomass value to offset the non – marketable components of the increase, no dimension.
- D = Basic wood density value, ton m⁻³. The value applied for D is 0.496166.

The biomass expansion factor, BEF_i , and wood basic density value, D , come from the INGEI data set, having a BEF_i value for native forests, not classified by forest type, by Gayoso et al (2002). Likewise, there is only one wood density value for native species, without INGEI defining the original source, which is used for ensuring consistency with the INGEI.

The relation between above and below ground biomass in native forests, R , was estimated by Gayoso et al (2002) and is found in the INGEI data set. The value applied for R is 0.2869.

Forest remaining forest

Emission factors for degradation in forests remaining forests, carbon content enhancement from restoration of degraded forests, and forest conservation all use the same methodology.

The emission factors come from the national forest inventory, which is the basis for the methodology. The methodology determines a basal area for each forest hectare in t_1 and t_2 . The total volume of each hectare is calculated based on this data:

Equation 16

$$Vol = KAB^{\beta}$$

Where:

- Vol = Volume of trees in forest, cubic meters ha^{-1} .
- AB = Basal area square meters ha^{-1} .
- K = Constant, value of 2.9141.
- β = Constant, value of 1.2478.

To convert volume into CO_2 for its use in equation:

Equation 17

$$EF = Vol * D * BEF$$

Where:

- EF = carbon stocks in forests that remain as such, ton biomass ha^{-1} .
- Vol = Volume of trees in forest, cubic meters ha^{-1} .
- D = average forest density, tons meters $^{-3}$.
- BEF = biomass expansion and conversion factor for the conversion of annual net volume increase (bark included) into above ground biomass growth for one forest type, above ground biomass growth in tons (m^3 of average annual increase) $^{-10}$.

CALCULATION OF ANNUAL EMISSION HISTORICAL AVERAGE DURING THE REFERENCE PERIOD

Forest Degradation

There are two sub activities under the degradation activity, according to the definitions:

1. Degradation in forest remaining forest.
2. Degradation from Substitution.

Various methodologies are used for each sub – activity type as previously described and justified, to calculate FREL, adding different methodologies and reference periods in ton CO_{2e} , using the following equation:

Equation 18

$$FREL_{Deg} = \frac{(\sum_t^n \Delta C_{Bt,DegFF} + \sum_t^n \Delta C_{Bt,DegFNF}) * \frac{44}{12} + \sum_t^n GEI_{fire}}{p}$$

Where:

- $FREL_{Deg}$ = carbon stock annual average losses due to forest degradation during the reference period, in ton C year⁻¹.
- $\Delta C_{B_{t,DegFF}}$ = carbon stock change in forest lands that remain as such in year t of the reference period, in ton C.
- $\Delta C_{B_{t,DegFNF}}$ = carbon stock change in forest lands converted into arborescent scrub or plantations in year t of the reference period, in ton C.
- GEI_{fire} = Amount of non-CO₂ gas emissions from forest fires, ton CO₂e.
- p = years of the reference period.
- $\frac{44}{12}$ = factor for converting carbon into equivalent carbon dioxide, ton CO₂e ton C⁻¹.

Forest Carbon Stock Enhancement

Captures associated to areas that change from non – forest into forest, along with captures from forest areas that remain as such are accounted under the stock enhancement category.

1. Forest surface restitution and enhancement.
2. Restoration of degraded forests

Likewise, FREL activity data regarding forest carbon stock enhancements is estimated using differentiated methodologies for forests that remain as such and the identification of non – forest areas converted into forests, just as in the degradation FREL.

Equation 19

$$FRL_A = \frac{(\sum_t^n \Delta C_{B_{t,ANFF}} + \sum_t^n \Delta C_{B_{t,AFF}}) * \frac{44}{12}}{p}$$

Where:

- FRL_A = annual average carbon stock increase during the reference period, in ton CO₂e year⁻¹.
- $\Delta C_{B_{t,ANFF}}$ = carbon stock change in year t , from non – forest lands converted into forest during the reference period, under the stock enhancement activity (A), in ton C.
- $\Delta C_{B_{t,AFF}}$ = annual carbon stock change in forest areas that remain as forest, considering total area, in ton C year⁻¹.

p = years of the reference period.

3 DATA AND PARAMETERS

3.1 Fixed Data and Parameters

Parameter:	Biomass expansion factor (BEF) for the native forest
Description:	This factor expands the total volume of above ground biomass to compensate for non-marketable aspects of the enhancement.
Data unit:	Dimensionless parameter
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	The Biomass expansion factor comes from information collected in the country from the study of Gayoso et al. (2002) and used in INGEI (2020). This value is for native species and has a national spatial level.
Value applied:	1.75
QA/QC procedures applied	These are reference national values obtained from Gayoso et al. (2002) and INGEI (2020) as was mentioned before.
Uncertainty associated with this parameter:	Error calculation based on statistical data from the Biomass Inventory and Carbon Accounting of the Universidad Austral de Chile (UACH). Error: 18%
Any comment:	This value is used in the Enhancement activity – No forest to native forest tool. For better comprehension, the tab names follow the same naming convention, e.g., <i>MauleNB-B_NR</i> or <i>RegionNB-B_RP4</i>. “Maule” refers to the name of the region; “NB-B” stands for <i>no bosque-bosque</i> (non-forest to forest), which corresponds to the Enhancement activity – No forest to native forest; and “NR” stands for <i>Nivel de Referencia</i> (Reference Level) and for the monitoring periods, the only change is at the end of the tab name, which uses “RP4” to indicate <i>Reporting Period</i>. BEF is stored in “parametros_gen” table (from the server), which is connected to the “Tabla_LU” tab through Power Query. This applies to the enhancement tool and is referenced in all the regions tabs (e.g <i>MauleNB-B</i>) in column N. Link: https://plataforma.encrv.cl/static/erpa/mr4/aumento/Herramienta_Aumentos_NR2_MR4_v033.xlsx

Parameter:	Basic density value of the wood (D)
Description:	Calculated using basic density data collected from native species growing in Chile.
Data unit:	t d.m. m ⁻³
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	A bibliographic review of basic densities of the forest species in Chile was carried out and there were no modifications for the value exposed from Gayoso et al. (2002) and INGEI (2020).
Value applied:	0.496166

QA/QC procedures applied	These are reference national values obtained from Gayoso et al. (2002) and INGEI (2020) as was mentioned before.
Uncertainty associated with this parameter:	Calculation was performed using basic density data collected from native species growing in Chile. Error: 5.6%
Any comment:	

Parameter:	Root-to-shoot ratios of native forest (R factor)
Description:	Relationship between below ground and above ground biomass
Data unit:	t d.m. m ⁻³
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	R factor comes from information collected in the country (Gayoso et al., 2002; INGEI, 2020). This value is within the range of values indicated in the 2006 IPCC Guidelines for temperate forests (between 0.20 and 0.46, according to Table 4.4; Chapter 4; Volume 4) and within the values available worldwide, which provide R factors that range between 0.09 and 0.33. This value is for native species and has a national spatial level.
Value applied:	0.2869
QA/QC procedures applied	These are reference national values obtained from Gayoso et al. (2002) and INGEI (2020) as was mentioned before.
Uncertainty associated with this parameter:	Error calculation based on statistical data from the Biomass Inventory and Carbon Accountancy of the Universidad Austral de Chile (UACH). Error: 9.4%
Any comment:	The R factor is applied directly to the aboveground biomass, for native forests (forest types/structures) and mixed forests. All the values are stored in the "ipa" and "ipaa_mixto" tables (from the servers), which are connected to the "Tabla_LU" tab through Power Query. This applies to deforestation and substitution tools and are referenced in all the regions tab (e.g <i>MauleB-NB</i>) in column N. https://plataforma.encrv.cl/static/erpa/mr4/deforestacion/Herramienta_De_forestacion_NR2_MR4_v022.xlsx and https://plataforma.encrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx

Parameter:	Above and below ground biomass of other uses
Description:	Above and below ground biomass of Urban and Industrial Areas, agricultural land, grassland, scrub, arborescent scrub, shrub planting, succulent scrub, succulent formations, plantations, wetlands, areas deprived of vegetation, eternal snows and glaciers, waterbodies and unrecognized areas
Data unit:	Tons of dry biomass ha ⁻¹ (t d.m. ha ⁻¹)
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	• Urban and Industrial Areas (INGEI, 2020) • Agricultural land (INGEI, 2020) • Grassland (Gayoso et al., 2006) • Grassland - Scrub (Gayoso et al., 2006) • Scrub (Gayoso et al., 2006)

	• Arborescent scrub (Gayoso et al., 2006) • Scrub with succulent (Gayoso et al., 2006) • Succulent formations (assumption of grassland values (Gayoso et al., 2006)) • Shrub planting (Gayoso et al., 2006) • Plantation (Expert national panel) • Wetlands (assumption) • Areas deprived of vegetation (assumption) • Eternal snows and glaciers (assumption) • Waterbodies (assumption) • Unrecognized areas (assumption) These are reference national values obtained from Gayoso et al. (2006), INGEI (2020), an expert national panel and assumption as mentioned before.																																																
Value applied:	<table><thead><tr><th>Use / sub use</th><th>t dry above ground biomass ha⁻¹</th><th>t dry below ground biomass ha⁻¹</th></tr></thead><tbody><tr><td>Urban and Industrial Areas</td><td>2</td><td>0</td></tr><tr><td>Agricultural land</td><td>10</td><td>2</td></tr><tr><td>Grassland</td><td>4.73</td><td>8.13</td></tr><tr><td>Grassland - Scrub</td><td>9.04</td><td>14.99</td></tr><tr><td>Scrub</td><td>9.04</td><td>14.99</td></tr><tr><td>Arborescent scrub</td><td>21.78</td><td>35.25</td></tr><tr><td>Scrub with succulent</td><td>9.04</td><td>14.99</td></tr><tr><td>Succulent formations</td><td>4.73</td><td>8.13</td></tr><tr><td>Shrub planting</td><td>9.04</td><td>14.99</td></tr><tr><td>Plantation</td><td>0</td><td>0</td></tr><tr><td>Wetlands</td><td>0</td><td>0</td></tr><tr><td>Areas deprived of vegetation</td><td>0</td><td>0</td></tr><tr><td>Eternal snows and glaciers</td><td>0</td><td>0</td></tr><tr><td>Waterbodies</td><td>0</td><td>0</td></tr><tr><td>Unrecognized areas</td><td>0</td><td>0</td></tr></tbody></table>	Use / sub use	t dry above ground biomass ha ⁻¹	t dry below ground biomass ha ⁻¹	Urban and Industrial Areas	2	0	Agricultural land	10	2	Grassland	4.73	8.13	Grassland - Scrub	9.04	14.99	Scrub	9.04	14.99	Arborescent scrub	21.78	35.25	Scrub with succulent	9.04	14.99	Succulent formations	4.73	8.13	Shrub planting	9.04	14.99	Plantation	0	0	Wetlands	0	0	Areas deprived of vegetation	0	0	Eternal snows and glaciers	0	0	Waterbodies	0	0	Unrecognized areas	0	0
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QA/QC procedures applied	These are reference national values obtained from Gayoso et al. (2006), INGEI (2020), an expert national panel and assumption as mentioned before.																																																
Uncertainty associated with this parameter:	Data from INGEI (2020) and Gayoso et al., (2006). <table><thead><tr><th>Use / sub use</th><th>Error % in above ground biomass</th></tr></thead><tbody><tr><td>Urban and Industrial Areas</td><td>95%</td></tr><tr><td>Agricultural land</td><td>75%</td></tr><tr><td>Grassland</td><td>27.7%</td></tr><tr><td>Grassland – Scrub</td><td>34.6%</td></tr><tr><td>Scrub</td><td>34.6%</td></tr><tr><td>Arborescent scrub</td><td>22.4%</td></tr><tr><td>Scrub with succulent</td><td>34.6%</td></tr><tr><td>Succulent formations</td><td>27.7%</td></tr><tr><td>Shrub planting</td><td>34.6%</td></tr></tbody></table>	Use / sub use	Error % in above ground biomass	Urban and Industrial Areas	95%	Agricultural land	75%	Grassland	27.7%	Grassland – Scrub	34.6%	Scrub	34.6%	Arborescent scrub	22.4%	Scrub with succulent	34.6%	Succulent formations	27.7%	Shrub planting	34.6%																												
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	Uncertainty for below ground biomass (BGB) of Non-Forest lands is based on propagation error estimate following IPCC approach 1 of Matorral-Arborescente AGB error (22.42%) and Root shoot ratio -R Factor error (48.27%) estimated by Gayoso et al. (2002), resulting in total uncertainty of 53.2%.
Any comment:	Above and below ground biomass of other uses, are used in deforestation, substitution and enhancement tools. For deforestation and substitution tool the values are referenced in column R, for the enhancement tool the values are used in column T, this applies for all the regions and period tab (e.g <i>MauleB-NB_NR</i>). The values come from the table “existencias_bio” (from the servers) which is connected to the “Tabla_LU” tab through Power Query. <u>Links:</u> https://plataforma.encrv.cl/static/erpa/mr4/aumento/Herramienta_Aumentos_NR2_MR4_v033.xlsx https://plataforma.encrv.cl/static/erpa/mr4/deforestacion/Herramienta_Deforestacion_NR2_MR4_v022.xlsx and https://plataforma.encrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx

Parameter:	Above and below ground biomass of native forest.																																		
Description:	Above and below ground biomass of native forest. The native forest is classified by different forest types and structure. Each forest type has its own biomass value in some cases, depending on data availability.																																		
Data unit:	Tons of dry biomass ha ⁻¹ (t d.m. ha ⁻¹).																																		
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Native forest data are national data and published in INGEI (2020). The mixed forest is calculated as a weighted average value of the forest types present in the region and according to the forest type surface present for the activity of deforestation of the period. For missing biomass values of the forest types and some of the structures a weighted average value was calculated in the region and according to the forest type surface present at the final year in reference level (2013). The AGB and BGB parameters are estimated from the IFN plots. The estimate of the variation in carbon content on forests that remain as such for FREL/FRL and monitoring report for Degradation, Restoration of Forest remaining forests and Forestry Conservation activities is estimated based on information coming from the Continuous Inventory of Forest Ecosystems and the application of remote sensing techniques on LANDSAT satellite images.																																		
Value applied:	<table> <tr> <th>Forest type</th><th>Structure</th><th>AGB (t d.m. ha⁻¹)</th><th>BGB (t d.m. ha⁻¹)</th></tr> <tr> <td>Alerce</td><td>Adult</td><td>339.1</td><td>97.3</td></tr> <tr> <td>Alerce</td><td>Young</td><td>203.6</td><td>58.4</td></tr> <tr> <td>Alerce</td><td>Adult/Young</td><td>203.6</td><td>58.4</td></tr> <tr> <td>Alerce</td><td>Stunted</td><td>339.1</td><td>97.3</td></tr> <tr> <td>Cipres de las Guaitecas</td><td>Adult</td><td>198.0</td><td>56.8</td></tr> <tr> <td>Cipres de las Guaitecas</td><td>Young</td><td>198.0</td><td>56.8</td></tr> <tr> <td>Cipres de las Guaitecas</td><td>Adult/Young</td><td>198.0</td><td>56.8</td></tr> </table>			Forest type	Structure	AGB (t d.m. ha ⁻¹)	BGB (t d.m. ha ⁻¹)	Alerce	Adult	339.1	97.3	Alerce	Young	203.6	58.4	Alerce	Adult/Young	203.6	58.4	Alerce	Stunted	339.1	97.3	Cipres de las Guaitecas	Adult	198.0	56.8	Cipres de las Guaitecas	Young	198.0	56.8	Cipres de las Guaitecas	Adult/Young	198.0	56.8
Forest type	Structure	AGB (t d.m. ha ⁻¹)	BGB (t d.m. ha ⁻¹)																																
Alerce	Adult	339.1	97.3																																
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Cipres de las Guaitecas	Young	198.0	56.8																																
Cipres de las Guaitecas	Adult/Young	198.0	56.8																																

	Cipres de las Guaitecas	Stunted	198.0	56.8
	Araucaria	Adult	421.4	120.9
	Araucaria	Young	219.1	62.9
	Araucaria	Adult/Young	219.1	62.9
	Araucaria	Stunted	421.4	120.9
	Cipres de la Cordillera	Adult	124.0	35.6
	Cipres de la Cordillera	Young	124.0	35.6
	Cipres de la Cordillera	Adult/Young	124.0	35.6
	Cipres de la Cordillera	Stunted	124.0	35.6
	Lenga	Adult	198.5	56.9
	Lenga	Young	237.2	68.1
	Lenga	Adult/Young	237.2	68.1
	Lenga	Stunted	198.5	56.9
	Coihue de Magallanes	Adult	129.1	37.1
	Coihue de Magallanes	Young	129.1	37.1
	Coihue de Magallanes	Adult/Young	129.1	37.1
	Coihue de Magallanes	Stunted	129.1	37.1
	Roble - Hualo	Adult	114.9	33.0
	Roble - Hualo	Young	114.9	33.0
	Roble - Hualo	Adult/Young	114.9	33.0
	Roble - Hualo	Stunted	114.9	33.0
	Roble - Rauli - Coihue	Adult	178.6	51.2
	Roble - Rauli - Coihue	Young	152.8	43.8
	Roble - Rauli - Coihue	Adult/Young	152.8	43.8
	Roble - Rauli - Coihue	Stunted	178.6	51.2
	Coihue - Rauli - Tepa	Adult	377.0	108.2
	Coihue - Rauli - Tepa	Young	377.0	108.2
	Coihue - Rauli - Tepa	Adult/Young	377.0	108.2
	Coihue - Rauli - Tepa	Stunted	377.0	108.2
	Esclerófilo	Adult	18.6	5.3
	Esclerófilo	Young	18.6	5.3
	Esclerófilo	Adult/Young	18.6	5.3
	Esclerófilo	Stunted	18.6	5.3
	Siempreverde	Adult	361.6	103.8
	Siempreverde	Young	127.3	36.5
	Siempreverde	Adult/Young	127.3	36.5
	Siempreverde	Stunted	361.6	103.8
QA/QC procedures applied	SOP_06_Field Operation Manual			
Uncertainty associated with this parameter:	Uncertainty for Below Ground Biomass BGB is based on propagation error estimate following IPCC approach 1 of Above Ground Biomass-AGB error (18.85%) and Root shoot ratio -R Factor error (9.4%) estimated by Gayoso et al. (2002), resulting in total uncertainty of 44.2%. For the forest types with a limited number of sampling plots, AGB uncertainty propagation with Monte Carlo analysis uses the following information: i. DBH measurement error (0.2%), calculation based on Continuous Forest Inventory data of INFOR; ii. Volume estimation error (0.07%), calculation based on Continuous Forest Inventory data of INFOR, iii. Biomass Expansion Factor (BEF) error (18.0%), BEF comes from information collected in the country from the study of Gayoso et al. (2002) and used in INGEI (2020). This value is for native			

	species and has a national spatial level. Error calculation is based on statistical data from the Biomass Inventory and Carbon Accountancy of the Universidad Austral de Chile (UACH); and iv. Wood Density (5.6%) calculated using basic density data collected from native species growing in Chile. Finally, these uncertainties are combined following IPCC approach 1 (error propagation), resulting in total uncertainty of 18.85%
Any comment:	Values from above and below ground biomass of native forests are stored in the “ipa” table (from the server), which is connected to the “Tabla_LU” tab through Power Query. This applies to deforestation and substitution tools, and the values are referenced in all the regions tab (e.g <i>MauleB-NB_NR</i>) in column N. Links: https://plataforma.encrv.cl/static/erpa/mr4/deforestacion/Herramienta_De_forestacion_NR2_MR4_v022.xlsx and https://plataforma.encrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx

Parameter:	Dead organic matter of native forest (DOM).																																															
Description:	The native forest is classified by different forest types and structures. Each forest type has its own dead organic matter value in some cases, depending on data availability. The mixed forest is calculated as a weighted average value of the forest types present in the region and according to the forest surface present for the activity of deforestation of the period. For the missing DOM value of the forest types and some of the structures, a weighted average value was calculated in the region and according to the forest type surface present at the final year in the reference level (2013).																																															
Data unit:	Tons of carbon in dead organic matter ha ⁻¹ (tC ha ⁻¹).																																															
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Forest native data is national data and published in INGEI (2020).																																															
Value applied:	<table><tr><th>Forest type</th><th>Structure</th><th>AGB (tC ha⁻¹)</th></tr><tr><td>Alerce</td><td>Adult</td><td>121.4</td></tr><tr><td>Alerce</td><td>Young</td><td>121.4</td></tr><tr><td>Alerce</td><td>Adult/Young</td><td>121.4</td></tr><tr><td>Alerce</td><td>Stunted</td><td>121.4</td></tr><tr><td>Cipres de las Guaitecas</td><td>Adult</td><td>62.11</td></tr><tr><td>Cipres de las Guaitecas</td><td>Young</td><td>62.11</td></tr><tr><td>Cipres de las Guaitecas</td><td>Adult/Young</td><td>62.11</td></tr><tr><td>Cipres de las Guaitecas</td><td>Stunted</td><td>62.11</td></tr><tr><td>Araucaria</td><td>Adult</td><td>133.4</td></tr><tr><td>Araucaria</td><td>Young</td><td>133.4</td></tr><tr><td>Araucaria</td><td>Adult/Young</td><td>133.4</td></tr><tr><td>Araucaria</td><td>Stunted</td><td>133.4</td></tr><tr><td>Cipres de la Cordillera</td><td>Adult</td><td>62.11</td></tr><tr><td>Cipres de la Cordillera</td><td>Young</td><td>62.11</td></tr></table>			Forest type	Structure	AGB (tC ha ⁻¹)	Alerce	Adult	121.4	Alerce	Young	121.4	Alerce	Adult/Young	121.4	Alerce	Stunted	121.4	Cipres de las Guaitecas	Adult	62.11	Cipres de las Guaitecas	Young	62.11	Cipres de las Guaitecas	Adult/Young	62.11	Cipres de las Guaitecas	Stunted	62.11	Araucaria	Adult	133.4	Araucaria	Young	133.4	Araucaria	Adult/Young	133.4	Araucaria	Stunted	133.4	Cipres de la Cordillera	Adult	62.11	Cipres de la Cordillera	Young	62.11
Forest type	Structure	AGB (tC ha ⁻¹)																																														
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	Cipres de la Cordillera	Adult/Young	62.11
	Cipres de la Cordillera	Stunted	62.11
	Lenga	Adult	43.4
	Lenga	Young	43.4
	Lenga	Adult/Young	43.4
	Lenga	Stunted	43.4
	Coihue de Magallanes	Adult	140.1
	Coihue de Magallanes	Young	140.1
	Coihue de Magallanes	Adult/Young	140.1
	Coihue de Magallanes	Stunted	140.1
	Roble - Hualo	Adult	62.11
	Roble - Hualo	Young	62.11
	Roble - Hualo	Adult/Young	62.11
	Roble - Hualo	Stunted	62.11
	Roble - Rauli - Coihue	Adult	52.9
	Roble - Rauli - Coihue	Young	52.9
	Roble - Rauli - Coihue	Adult/Young	52.9
	Roble - Rauli - Coihue	Stunted	52.9
	Coihue - Rauli - Tepa	Adult	74.4
	Coihue - Rauli - Tepa	Young	74.4
	Coihue - Rauli - Tepa	Adult/Young	74.4
	Coihue - Rauli - Tepa	Stunted	74.4
	Esclerófilo	Adult	16.7
	Esclerófilo	Young	16.7
	Esclerófilo	Adult/Young	16.7
	Esclerófilo	Stunted	16.7
	Siempreverde	Adult	64.8
	Siempreverde	Young	64.8
	Siempreverde	Adult/Young	64.8
	Siempreverde	Stunted	64.8
QA/QC procedures applied	SOP_06_Field Operation Manual		
Uncertainty associated with this parameter:	Error estimated from permanent plots of the INFOR Continuous Forest Inventory Error: 28.4%		
Any comment:	Values from dead organic matter of native forest (DOM) are stored in the "ipa" table (from the server), which is connected to the "Tabla_LU" tab through Power Query. This applies to deforestation and substitution tools, and the values are referenced in all the regions tab (e.g <i>MauleB-NB_RP4</i>) in column N. Links: https://plataforma.encrv.cl/static/erpa/mr4/deforestacion/Herramienta_Deforestacion_NR2_MR4_v022.xlsx and https://plataforma.encrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx		

Parameter:	Periodic annual increment (PAI) according to forest type
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Description:	Periodic annual increment (PAI) according to forest type and structure. Each forest type has its own biomass value in some cases, depend on data availability. For missing PAI value of the forest types and some of the structures a weighted average value was calculated in the region and according to the forest type surface present at the final year in the reference level (2013).																																																																																									
Data unit:	Cubic meter per hectare and year (m³ ha⁻¹ year⁻¹)																																																																																									
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Forest native data are national data and published in INGEI (2020)																																																																																									
Value applied:	<table><thead><tr><th>Forest type</th><th>Structure</th><th>PAI (m³ ha⁻¹ year⁻¹)</th></tr></thead><tbody><tr><td>Alerce</td><td>Mature</td><td>0.5</td></tr><tr><td>Alerce</td><td>Young</td><td>0.5</td></tr><tr><td>Alerce</td><td>Mature/Young</td><td>0.5</td></tr><tr><td>Alerce</td><td>Stunted</td><td>0.5</td></tr><tr><td>Ciprés de las Guaitecas</td><td>Mature</td><td>3.9</td></tr><tr><td>Ciprés de las Guaitecas</td><td>Young</td><td>3.9</td></tr><tr><td>Ciprés de las Guaitecas</td><td>Mature/Young</td><td>3.9</td></tr><tr><td>Ciprés de las Guaitecas</td><td>Stunted</td><td>3.9</td></tr><tr><td>Araucaria</td><td>Mature</td><td>4.6</td></tr><tr><td>Araucaria</td><td>Young</td><td>4.6</td></tr><tr><td>Araucaria</td><td>Mature/Young</td><td>4.6</td></tr><tr><td>Araucaria</td><td>Stunted</td><td>4.6</td></tr><tr><td>Ciprés de la Cordillera</td><td>Mature</td><td>5</td></tr><tr><td>Ciprés de la Cordillera</td><td>Young</td><td>2.7</td></tr><tr><td>Ciprés de la Cordillera</td><td>Mature/Young</td><td>2.7</td></tr><tr><td>Ciprés de la Cordillera</td><td>Stunted</td><td>5</td></tr><tr><td>Lenga</td><td>Mature</td><td>5.8</td></tr><tr><td>Lenga</td><td>Young</td><td>3.9</td></tr><tr><td>Lenga</td><td>Mature/Young</td><td>3.9</td></tr><tr><td>Lenga</td><td>Stunted</td><td>5.8</td></tr><tr><td>Coihue de Magallanes</td><td>Mature</td><td>2.6</td></tr><tr><td>Coihue de Magallanes</td><td>Young</td><td>3.7</td></tr><tr><td>Coihue de Magallanes</td><td>Mature/Young</td><td>3.7</td></tr><tr><td>Coihue de Magallanes</td><td>Stunted</td><td>2.6</td></tr><tr><td>Roble - Hualo</td><td>Mature</td><td>5.1</td></tr><tr><td>Roble - Hualo</td><td>Young</td><td>3.5</td></tr><tr><td>Roble - Hualo</td><td>Mature/Young</td><td>3.5</td></tr><tr><td>Roble - Hualo</td><td>Stunted</td><td>5.1</td></tr></tbody></table>			Forest type	Structure	PAI (m³ ha⁻¹ year⁻¹)	Alerce	Mature	0.5	Alerce	Young	0.5	Alerce	Mature/Young	0.5	Alerce	Stunted	0.5	Ciprés de las Guaitecas	Mature	3.9	Ciprés de las Guaitecas	Young	3.9	Ciprés de las Guaitecas	Mature/Young	3.9	Ciprés de las Guaitecas	Stunted	3.9	Araucaria	Mature	4.6	Araucaria	Young	4.6	Araucaria	Mature/Young	4.6	Araucaria	Stunted	4.6	Ciprés de la Cordillera	Mature	5	Ciprés de la Cordillera	Young	2.7	Ciprés de la Cordillera	Mature/Young	2.7	Ciprés de la Cordillera	Stunted	5	Lenga	Mature	5.8	Lenga	Young	3.9	Lenga	Mature/Young	3.9	Lenga	Stunted	5.8	Coihue de Magallanes	Mature	2.6	Coihue de Magallanes	Young	3.7	Coihue de Magallanes	Mature/Young	3.7	Coihue de Magallanes	Stunted	2.6	Roble - Hualo	Mature	5.1	Roble - Hualo	Young	3.5	Roble - Hualo	Mature/Young	3.5	Roble - Hualo	Stunted	5.1
Forest type	Structure	PAI (m³ ha⁻¹ year⁻¹)																																																																																								
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Araucaria	Mature	4.6																																																																																								
Araucaria	Young	4.6																																																																																								
Araucaria	Mature/Young	4.6																																																																																								
Araucaria	Stunted	4.6																																																																																								
Ciprés de la Cordillera	Mature	5																																																																																								
Ciprés de la Cordillera	Young	2.7																																																																																								
Ciprés de la Cordillera	Mature/Young	2.7																																																																																								
Ciprés de la Cordillera	Stunted	5																																																																																								
Lenga	Mature	5.8																																																																																								
Lenga	Young	3.9																																																																																								
Lenga	Mature/Young	3.9																																																																																								
Lenga	Stunted	5.8																																																																																								
Coihue de Magallanes	Mature	2.6																																																																																								
Coihue de Magallanes	Young	3.7																																																																																								
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Coihue de Magallanes	Stunted	2.6																																																																																								
Roble - Hualo	Mature	5.1																																																																																								
Roble - Hualo	Young	3.5																																																																																								
Roble - Hualo	Mature/Young	3.5																																																																																								
Roble - Hualo	Stunted	5.1																																																																																								

	Roble - Raulí - Coihue	Mature	6.6
	Roble - Raulí - Coihue	Young	4.1
	Roble - Raulí - Coihue	Mature/Young	4.1
	Roble - Raulí - Coihue	Stunted	6.6
	Coihue - Raulí - Tepa	Mature	5.8
	Coihue - Raulí - Tepa	Young	4.9
	Coihue - Raulí - Tepa	Mature/Young	4.9
	Coihue - Raulí - Tepa	Stunted	5.8
	Esclerófilo	Mature	1.5
	Esclerófilo	Young	1.6
	Esclerófilo	Mature/Young	1.6
	Esclerófilo	Stunted	1.5
	Siempreverde	Mature	6
	Siempreverde	Young	4.1
	Siempreverde	Mature/Young	4.1
	Siempreverde	Stunted	6
QA/QC procedures applied	SOP_06_Field Operation Manual		
Uncertainty associated with this parameter:	SOP_06 Field Operations Manual was implemented during fieldwork to estimate PAI in the National Forest Inventory, for some forest types were possible to adjust a Probability Distribution Function (PDF). For the forest types with a limited number of sampling plots, uncertainty propagation with Monte Carlo analysis uses the calculation of the measurement uncertainty for PAI based on the 95% CI of the removal rate by forest type, calculated with Continuous Forest Inventory data of INFOR. ● PAI Araucaria Adulto, PAI Lenga Adulto, PAI Lenga Renoval, PAI Roble - Hualo Adulto, PAI Roble - Raulí - Coihue Adulto, PAI Roble - Raulí - Coihue Renoval, PAI Coihue - Raulí - Tepa Adulto, PAI Coihue - Raulí - Tepa Renoval, PAI Esclerófilo Adulto, PAI Siempreverde Adulto, PAI Siempreverde Renoval= adjust a Probability Distribution Function (PDF) ● PAI Alerce Adulto = 58.47% (The higher uncertainty of the errors estimated for PAI is assumed due to a lack of data.) ● PAI Ciprés de las Guaitecas Adulto = 58.47% (The higher uncertainty of the errors estimated for IPA is assumed due to a lack of data.) ● PAI Ciprés de la Cordillera Adulto =15.83% (Error estimated from permanent plots of the INFOR Continuous Forest Inventory) ● PAI Ciprés de la Cordillera Renoval = 9.97% (Error estimated from permanent plots of the INFOR Continuous Forest Inventory) ● PAI Coihue de Magallanes Adulto = 13.42% (Error estimated from permanent plots of the INFOR Continuous Forest Inventory) ● PAI Coihue de Magallanes Renoval = 7.68% (Error estimated from permanent plots of the INFOR Continuous Forest Inventory) ● PAI Roble - Hualo Renoval = 54.47% (The higher uncertainty of the errors estimated for PAI is assumed due to a lack of data) ● PAI Esclerófilo Renoval = 21.31% (Error estimated from permanent plots of the INFOR Continuous Forest Inventory)		
Any comment:	Values from periodic annual increment (PAI) according to forest type are stored in the "ipa" table (from the server), which is connected to the "Tabla_LU" tab through Power Query. This applies to the enhancement tool,		

	and the values are referenced in all the regions tab (e.g <i>MauleNB-B_NR</i>) in column M. Link: https://plataforma.encrv.cl/static/erpa/mr4/aumento/Herramienta_Aumentos_NR2_MR4_v033.xlsx
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Parameter:	Combustion factor
Description:	Emission factor for degradation due to forest fires
Data unit:	Non-dimensional
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Intergovernmental Panel on Climate Change (IPCC). 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 2, Table 2.6 All other temperate forests
Value applied:	0.45
QA/QC procedures applied	
Uncertainty associated with this parameter:	Error estimated using the standard deviation and median default emission factor of the IPCC 2006. Error: 36%
Any comment:	The combustion factor is used within the forest fires tool. In the "Incendios_RP4" tab, the factor is referenced in column E, whereas in the "Incendios_NR" tab it is referenced in column N. The values are stored in the "parametros_gen" table hosted on the server, which is linked to the "Tabla_LU" tab through Power Query. https://plataforma.encrv.cl/static/erpa/mr4/incendios/Herramienta_Incendios_NR2_MR4_v019.xlsx

Parameter:	N ₂ O emission factor
Description:	Emission factor for degradation due to forest fires
Data unit:	g kg ⁻¹ of burned dry material
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Intergovernmental Panel on Climate Change (IPCC). 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 2, Table 2.5 International - Extra tropical forest
Value applied:	0.26
QA/QC procedures applied	
Uncertainty associated with this parameter:	Error estimated using the standard deviation and median default emission factor of the IPCC 2006. Error: 43.8%
Any comment:	The N ₂ O emission factor is used within the forest fires tool. In the "Incendios_RP4" tab, the factor is referenced in column G, whereas in the "Incendios_NR" tab it is referenced in column P. The values are stored in the "parametros_gen" table hosted on the server, which is linked to the "Tabla_LU" tab through Power Query. https://plataforma.encrv.cl/static/erpa/mr4/incendios/Herramienta_Incendios_NR2_MR4_v019.xlsx

Parameter:	CH ₄ emission factor
Description:	Emission factor for degradation due to forest fires
Data unit:	g kg ⁻¹ of burned dry material
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Intergovernmental Panel on Climate Change (IPCC). 2006. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Volume 4, Chapter 2, Table 2.5 International - Extra tropical forest
Value applied:	4.7
QA/QC procedures applied	
Uncertainty associated with this parameter:	Error estimated using the standard deviation and median default emission factor of the IPCC 2006. Error: 29.0%
Any comment:	The combustion factor is used within the forest fires tool. In the "Incendios_RP4" tab, the factor is referenced in column F, whereas in the "Incendios_NR" tab it is referenced in column O. The values are stored in the "parametros_gen" table hosted on the server, which is linked to the "Tabla_LU" tab through Power Query. https://plataforma.encrv.cl/static/erpa/mr4/incendios/Herramienta_Incendios_NR2_MR4_v019.xlsx

Deforestation FREL/FRL

Parameter:	$\Delta A_{TO_OTHERS,i,t}$ = Areas of different Forest Types(i) converted to another category of land use during the 2001 – 2013 period.																								
Description:	Chile has eleven different Native Forest Types in the PRE area.																								
Data unit:	Total hectares (ha/year) of the 2001-2013 period.																								
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Forest Type</th><th>Area</th></tr> <tr> <td>Alerce</td><td>119.3</td></tr> <tr> <td>Araucaria</td><td>337.3</td></tr> <tr> <td>Ciprés de la Cordillera</td><td>35.4</td></tr> <tr> <td>Ciprés de las Guaitecas</td><td>9.2</td></tr> <tr> <td>Coihue - Raulí - Tepa</td><td>653.3</td></tr> <tr> <td>Coihue de Magallanes</td><td>143.9</td></tr> <tr> <td>Esclerófilo</td><td>407.2</td></tr> <tr> <td>Lenga</td><td>2,519.3</td></tr> <tr> <td>Roble - Hualo</td><td>104.4</td></tr> <tr> <td>Roble - Raulí - Coihue</td><td>1,714.6</td></tr> <tr> <td>Siempreverde</td><td>1,873.9</td></tr> </table>	Forest Type	Area	Alerce	119.3	Araucaria	337.3	Ciprés de la Cordillera	35.4	Ciprés de las Guaitecas	9.2	Coihue - Raulí - Tepa	653.3	Coihue de Magallanes	143.9	Esclerófilo	407.2	Lenga	2,519.3	Roble - Hualo	104.4	Roble - Raulí - Coihue	1,714.6	Siempreverde	1,873.9
Forest Type	Area																								
Alerce	119.3																								
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	<table> <tr> <td>Without Forest Type</td><td>144.6</td></tr> <tr> <td>Total (ha)</td><td>8,062.4</td></tr> </table>	Without Forest Type	144.6	Total (ha)	8,062.4
Without Forest Type	144.6				
Total (ha)	8,062.4				
Source of data and description of measurement/calculation methods and procedures applied:	Matrices of change in land use taken from Land Use Change Maps. Multipixel mosaics are used for the detection of changes in land use, focused in polygons of native forest. From the mosaic, the MIICA method is applied for the identification of spectral gains and losses, which through different techniques of post-processing allow identifying areas of forest losses and gains. The application of method establishes a series of requirements for the tiles, related to the removal of clouds, cloud shadows and artifacts. In addition, the map of use and change of use is linked to the information that comes from the Native Forest Cadastres of CONAF, therefore, the map of Land Use Change is the result of the application of the MIICA method, and the Cadastre of Native Forest. The Land Use Change Map is presented as a product through a coverage geographical area called "Traceability", which has as a characteristic the monitoring periods available for a certain region, which allows giving monitoring of historical land uses for each polygon. The final product is regional, characterized by stunted, mature, young mature, mixed and young forests converted into areas with no vegetation, urban and industrial areas, waterbodies, areas where succulents, wetlands, scrubland, perennial snow and glaciers, grasslands and farmland have formed.				
QA/QC procedures applied:	For the generation of deforestation activity data and as part of the QA / QC process, the different procedures implemented are documented in SOPs that allow the estimates to be standardized over time. SOP_01: Selection of REDD+ satellite mosaics SOP_02: Elaboration of LULUCF maps				
Uncertainty for this parameter:	The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. The errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013). Error = Maule 111.3%, Ñuble 72.3%, Biobío 109.6%, Araucanía 191.6%, Los Ríos 96.6%, Los Lagos 89.1%				
Any comment:	Link: https://plataforma.encrv.cl/static/erpa/mr4/deforestacion/Herramienta_De_forestacion_NR2_MR4_v022.xlsx				

Degradation – forest remaining forest FREL/FRL

Parameter:	A_{DegFF} = Area of degradation of forests remaining forests monitored during 2001 - 2010 period, in areas not affected by browning (NBA).																
Description:	We have 6 regions for the PRE area, Maule, Ñuble, Biobío, La Araucanía, Los Ríos and Los Lagos. The Biobío Region was divided in two Region. The province of Ñuble, which was part of Biobío Region, is a new Region. The surface of the total area remains equal. The surface area was described by degradation of native forest that remains as such.																
Data unit:	Total hectares (ha/year) of the 2001-2010 period.																
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Region</th><th>Area</th></tr> <tr> <td>Maule</td><td>73,201</td></tr> <tr> <td>Ñuble</td><td>29,480</td></tr> <tr> <td>Biobío</td><td>50,825</td></tr> <tr> <td>La Araucanía</td><td>57,880</td></tr> <tr> <td>Los Ríos</td><td>29,709</td></tr> <tr> <td>Los Lagos</td><td>116,395</td></tr> <tr> <td>Total</td><td>357,490</td></tr> </table>	Region	Area	Maule	73,201	Ñuble	29,480	Biobío	50,825	La Araucanía	57,880	Los Ríos	29,709	Los Lagos	116,395	Total	357,490
Region	Area																
Maule	73,201																
Ñuble	29,480																
Biobío	50,825																
La Araucanía	57,880																
Los Ríos	29,709																
Los Lagos	116,395																
Total	357,490																
Source of data and description of measurement/calculation methods and procedures applied:	The data comes from INFOR's National Forest Inventory (IFN) plots, combined with spectral information from the Landsat series. This information integrates the variables of the state of the forests on the number of trees per hectare, basal area and volumes recorded by the monitoring of IFN plots, with the spectral data from Landsat to estimate carbon stocks in a spatially explicit way.																
QA/QC procedures applied:	Since one input for AD on degradation are the Land Use Change Maps in order to define areas of forest remaining forest, same QA/QC procedures and SOP are used during the process. Additional procedures are applied, and proper SOP were developed. SOP_05_ Method for estimating in forest remaining forests the carbon variation. SOP_06: Field Operations Manual																
Uncertainty for this parameter:	Degradation mapping accuracy estimated by INFOR. Error: 32.8%																
Any comment:	Link: https://plataforma.encrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx																

Degradation - Substitution activity FREL/FRL

Parameter:	A_{DegNFF} = Surface of degradation areas resulting from the conversion of forests into plantations during the 2001-2013 period.
Description:	The total of areas by forest type that was degradation to plantation were registered
Data unit:	Total hectares (ha/year) of the period 2001-2013

Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Forest Type</th><th>Area</th></tr> <tr> <td>Alerce</td><td>0.6</td></tr> <tr> <td>Araucaria</td><td>8.1</td></tr> <tr> <td>Ciprés de la Cordillera</td><td>15.2</td></tr> <tr> <td>Ciprés de las Guaitecas</td><td>0.8</td></tr> <tr> <td>Coihue - Raulí - Tepa</td><td>335.3</td></tr> <tr> <td>Coihue de Magallanes</td><td>2.5</td></tr> <tr> <td>Esclerófilo</td><td>1,423.8</td></tr> <tr> <td>Lenga</td><td>186</td></tr> <tr> <td>Roble - Hualo</td><td>523.1</td></tr> <tr> <td>Roble - Raulí - Coihue</td><td>2,881.3</td></tr> <tr> <td>Siempreverde</td><td>1,376.2</td></tr> <tr> <td>Without Forest Type</td><td>1,577.6</td></tr> <tr> <td>Total (ha)</td><td>8,330.4</td></tr> </table>	Forest Type	Area	Alerce	0.6	Araucaria	8.1	Ciprés de la Cordillera	15.2	Ciprés de las Guaitecas	0.8	Coihue - Raulí - Tepa	335.3	Coihue de Magallanes	2.5	Esclerófilo	1,423.8	Lenga	186	Roble - Hualo	523.1	Roble - Raulí - Coihue	2,881.3	Siempreverde	1,376.2	Without Forest Type	1,577.6	Total (ha)	8,330.4
Forest Type	Area																												
Alerce	0.6																												
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Siempreverde	1,376.2																												
Without Forest Type	1,577.6																												
Total (ha)	8,330.4																												
Source of data and description of measurement/calculation methods and procedures applied:	To estimate degradation of native forests converted to plantations, the equation used to estimate deforestation is applied, since it is assumed that, to establish a plantation, all the carbon content present in the preceding native forest must be reduced to zero.																												
QA/QC procedures applied:	For the generation of degradation by substitution activity data and as part of the QA / QC process, the different procedures implemented are documented through a series of protocols or SOPs that allow the estimates to be standardized over time. SOP_01: Selection of REDD+ satellite mosaics SOP_02: Elaboration of LULUCF maps																												
Uncertainty for this parameter:	The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. The errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013). Error = Maule 191.8%, Ñuble 139.9%, Biobío 134.9%, Araucanía 113.4%, Los Ríos 138.6%, Los Lagos 100.0%																												
Any comment:	Link: https://plataforma.enccrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx																												

Degradation – Forest fire activity FREL/FRL

Parameter:	A = Area burned between 2001-2010 in the ERP Regions.
Description:	The surface of burned areas was recorded to estimate the degradation of the native forest.
Data unit:	Total hectares (ha) of the 2001-2010 period.

Value monitored during this Monitoring / Reporting Period:	Region /Year	Maule	Biobío	La Araucanía	Los Lagos	Los Ríos	Ñuble
	2001	25.45	69.35	63.59	9.35	0.9	20.02
	2002	147.16	7,443.15	18,764.58	2,551.85	904.11	117.05
	2003	504.35	30.31	225.91	27.45	2.91	128.24
	2004	170.79	196.52	268.41	90.9	175.24	14.73
	2005	139.97	117.83	71.7	47.29	18.67	277.88
	2006	62.35	57.37	73.2	207.35	6.92	89.67
	2007	9.39	747.4	39.32	52.15	4.77	199.4
	2008	344.05	143.71	307.22	4,233.93	118.82	86.68
	2009	3,998.72	898.29	725.71	598.09	270.55	59.43
	2010	431.86	581.15	41.78	0.63	0.75	398.57
	Total period	5,834.09	10,285.08	20,581.42	7,818.99	1,503.64	1,392.37
Source of data and description of measurement/calculation methods and procedures applied:	The Forest Fire Protection Department and its Digital Information System for Operations Control provides annualized statistical information on the occurrence of forest fires for the entire country, which in recent years has been improved by adding the spatial location of fires.						
QA/QC procedures applied:	SOP_05_ Method for estimating in forest remaining forests the carbon variation.						
Uncertainty for this parameter:	Area burned uncertainty estimated by INGEI (2020) Error: 15%						
Any comment:	Link: https://plataforma.encrv.cl/static/erpa/mr4/incendios/Herramienta_Incendios_NR2_MR4_v019.xlsx						

Enhancement activity – No forest to native forest FREL/FRL

Parameter:	$\Delta A_{TOOTHERS, t}$ = Area of used non-forest land converted into forest during the reference level																		
Description:	The areas that correspond to non-forest lands were quantified in hectares to later estimate the carbon capture balances of these changes in land use. In this data forest plantations with exotic species are included as non-forest land.																		
Data unit:	Total hectares (ha/year) of the period 2001-2013																		
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Forest Type</th><th>Area</th></tr> <tr><td>Alerce</td><td>23</td></tr> <tr><td>Araucaria</td><td>103</td></tr> <tr><td>Ciprés de la Cordillera</td><td>125</td></tr> <tr><td>Ciprés de las Guaitecas</td><td>21</td></tr> <tr><td>Coihue - Raulí - Tapa</td><td>202</td></tr> <tr><td>Coihue de Magallanes</td><td>13</td></tr> <tr><td>Esclerófilo</td><td>4,863</td></tr> <tr><td>Lenga</td><td>320</td></tr> </table>	Forest Type	Area	Alerce	23	Araucaria	103	Ciprés de la Cordillera	125	Ciprés de las Guaitecas	21	Coihue - Raulí - Tapa	202	Coihue de Magallanes	13	Esclerófilo	4,863	Lenga	320
Forest Type	Area																		
Alerce	23																		
Araucaria	103																		
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Coihue de Magallanes	13																		
Esclerófilo	4,863																		
Lenga	320																		

	<table> <tr> <td>Roble - Hualo</td><td>490</td></tr> <tr> <td>Roble - Raulí - Coihue</td><td>3,585</td></tr> <tr> <td>Siempreverde</td><td>1,417</td></tr> <tr> <td>Without Forest Type</td><td>2,360</td></tr> <tr> <td>Total (ha)</td><td>13,522</td></tr> </table>	Roble - Hualo	490	Roble - Raulí - Coihue	3,585	Siempreverde	1,417	Without Forest Type	2,360	Total (ha)	13,522
Roble - Hualo	490										
Roble - Raulí - Coihue	3,585										
Siempreverde	1,417										
Without Forest Type	2,360										
Total (ha)	13,522										
Source of data and description of measurement/calculation methods and procedures applied:	A semi-automated technique is applied to detect changes using satellite images. The Multi-index method or MIICA (Jin et al., 2013) detects changes in land use for the period under study. The MIICA methodology is based on the combination of 2 spectral indices (dNBR, dNDVI) which, through integration rules, provide coverage of land use change, indicating the magnitude and directionality of the change. (Profit and loss). The MIICA methodology used images from the Landsat 8 sensor and was applied through a series of codes in programming language (Javascript, R) complemented with Google Earth Engine cloud processing, in GIS programs and R software, with the objective of obtaining an efficient land use change map.										
QA/QC procedures applied:	For the generation of enhancement (non-forest to forest) activity data and as part of the QA / QC process, the different procedures implemented are documented through a series of protocols or SOPs that allow the estimates to be standardized over time. SOP_01: Selection of REDD+ satellite mosaics SOP_02: Elaboration of LULUCF maps,										
Uncertainty for this parameter:	The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. The errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013). Error = Maule 80%, Ñuble 50.5%, Biobío 136.5%, Araucanía 192.2%, Los Ríos 65.1%, Los Lagos 138.5%										
Any comment:	Link: https://plataforma.encrv.cl/static/erpa/mr4/aumento/Herramienta_Aumentos_NR2_MR4_v033.xlsx										

Enhancement activity – forest remains forest in non-conservation areas FREL/FRL

Parameter:	A_{EnhFF} = Areas of non-conservation native forest that remains forest during the 2001– 2010 period for the Sixth Region of the ERP, in areas not affected by browning (NBA).										
Description:	The areas that in 2001-2010 are forest in non-conservation area and remain as such, the hectares were estimated.										
Data unit:	Total hectares (ha/year) of the 2001-2010 period.										
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Region</th><th>Area</th></tr> <tr> <td>Maule</td><td>88,778</td></tr> <tr> <td>Ñuble</td><td>33,323</td></tr> <tr> <td>Biobío</td><td>65,805</td></tr> <tr> <td>La Araucanía</td><td>87,901</td></tr> </table>	Region	Area	Maule	88,778	Ñuble	33,323	Biobío	65,805	La Araucanía	87,901
Region	Area										
Maule	88,778										
Ñuble	33,323										
Biobío	65,805										
La Araucanía	87,901										

	<table> <tr> <td>Los Ríos</td><td>47,402</td></tr> <tr> <td>Los Lagos</td><td>139,986</td></tr> <tr> <td>Total (ha)</td><td>463,195</td></tr> </table>	Los Ríos	47,402	Los Lagos	139,986	Total (ha)	463,195
Los Ríos	47,402						
Los Lagos	139,986						
Total (ha)	463,195						
Source of data and description of measurement/calculation methods and procedures applied:	The data comes from INFOR's National Forest Inventory IFN plots, combined with spectral information from the Landsat series. This information integrates the variables of the state of the forests on the number of trees per hectare and basal area recorded by the monitoring of IFN plots, with the spectral data from Landsat to estimate carbon stocks in a spatially explicit way.						
QA/QC procedures applied:	Since one input for AD on enhancement in areas of forest that remain as forest are the Land Use Change Maps in order to define areas of forest remaining forest, same QA/QC procedures and SOP are used during the process. Additional procedures are applied, and proper SOP were developed. SOP_05: Method for estimating in forest remaining forests the carbon variation. SOP_06: Field Operations Manual Inventory						
Uncertainty for this parameter:	Degradation mapping accuracy estimated by INFOR. Error: 32.8%						
Any comment:	Link: https://plataforma.encrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx						

Conservation activity FREL/FRL

Parameter:	$\Delta A_{TO_OTHERS_{i,t}}$ = Areas of conservation native forest that remains as such during the 2001-2010 period in the Six Region of the ERP, in areas not affected by browning (NBA).																
Description:	The areas that in 2001 to 2010 are forest in conservation area and remain as such																
Data unit:	Total hectares (ha) of the period 2001-2010																
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Region</th><th>Area</th></tr> <tr> <td>Maule</td><td>3,315</td></tr> <tr> <td>Ñuble</td><td>8,882</td></tr> <tr> <td>Biobío</td><td>15,509</td></tr> <tr> <td>La Araucanía</td><td>27,794</td></tr> <tr> <td>Los Ríos</td><td>26,371</td></tr> <tr> <td>Los Lagos</td><td>88,396</td></tr> <tr> <td>Total (ha)</td><td>170,267</td></tr> </table>	Region	Area	Maule	3,315	Ñuble	8,882	Biobío	15,509	La Araucanía	27,794	Los Ríos	26,371	Los Lagos	88,396	Total (ha)	170,267
Region	Area																
Maule	3,315																
Ñuble	8,882																
Biobío	15,509																
La Araucanía	27,794																
Los Ríos	26,371																
Los Lagos	88,396																
Total (ha)	170,267																

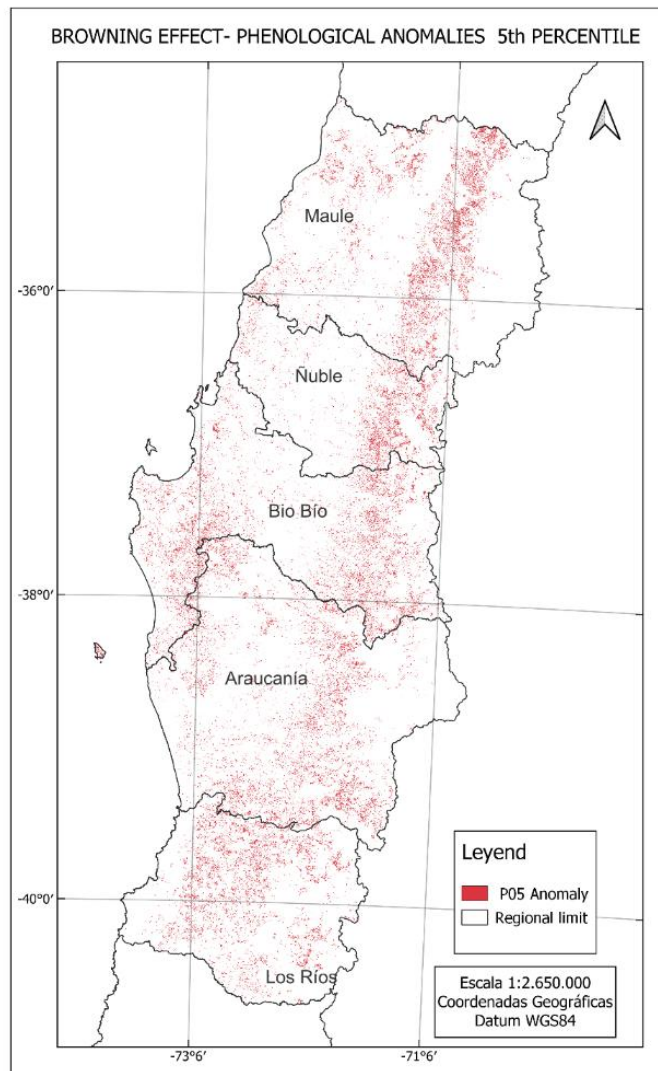
Source of data and description of measurement/calculation methods and procedures applied:	The data comes from INFOR's National Forest Inventory (IFN) plots, combined with spectral information from the Landsat series. This information integrates the variables of the state of the forests on the number of trees per hectare and basal area recorded by the monitoring of IFN plots, with the spectral data from Landsat to estimate carbon stocks in a spatially explicit way.
QA/QC procedures applied:	Since one input for AD on enhancement in areas of forest that remain as forest are the Land Use Change Maps in order to define areas of forest remaining forest, same QA/QC procedures and SOP are used during the process. Additional procedures are applied, and proper SOP were developed. SOP_05: Method for estimating in forest remaining forests the carbon variation. SOP_06: Field Operations Manual
Uncertainty for this parameter:	Degradation mapping accuracy estimated by INFOR. Error: 32.8%
Any comment:	Link: https://plataforma.encrcv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_Conservacion_NR2_MR4_v17.xlsx

Emissions and removals from browning affected forest area FREL/FRL

Parameter:	Browning = Areas of native forest that remains as such affected by browning during the 2001– 2010 period in the six Region of the ERP.			
Description:	The areas that in 2001 to 2010 are forests affected by browning in forest areas that remain as such.			
Data unit:	Total hectares (ha) of the 2001-2010 period.			
Value monitored during this Monitoring / Reporting Period:	Region	Degradation (Ha)	Enhancement (Ha)	Conservation (Ha)
	Maule	24,394	31,978	976
	Ñuble	7,157	8,850	1,342
	Biobío	10,009	14,065	2,666
	La Araucanía	7,725	11,916	776
	Los Ríos	3,323	6,640	299
	Los Lagos	1	0	0

	Total (ha)	52,609	73,449	6,059
Source of data and description of measurement/calculation methods and procedures applied:	As could be seen in certain tables by activity data described above, emissions accounting in forest remaining forest was carried out in areas not affected by browning (NBA) excluding the areas affected by browning (BA). This occurs due to areas affected by browning are considered as a non-anthropogenic emission source because the carbon fluxes that occur on these areas are not related to human activities as the deforestation activity. It is a non-anthropogenic source because it is generated by the decreases in precipitation falls, and water availability. The areas affected by browning correspond to those areas of forest that remain as forests that present phenological anomalies because of the impact of the megadrought. These anomalies were detected in the integral productivity of native forest in the ERP implementation area and are under the 5th percentile data productivity anomaly (GAC,2023). The phenological anomaly results in the desiccation of the crowns, loss of foliage and even the mortality of individuals. Down below is a map with the areas of the 5th percentile anomalies distribution. These areas were used in each monitoring report to exclude the emission related to the non-anthropogenic emissions in each period. They correspond to areas of native forest between the regions of Maule and La Araucanía, together with the area of the RORACO forest type extended to			

the region of Los Ríos.



It is worth clarifying that the browning effect emission are excluded in both the degradation, increase and conservation activities in forest remaining forest. However, the forest stratum affected by browning is not excluded from the ERP implementation and monitoring area, and its treatment is maintained continuously at the same level of scope as those areas outside this stratum.

The raster layer of phenological anomalies could be found in the following link:

<https://plataforma.encrv.cl/static/erpa/mr4/mapas/BROWNING-MR.zip>

The final report can be found in the following link:

<https://plataforma.encrv.cl/static/erpa/mr3/monitoreo-browning/Informe->

[Final.Identificación de áreas de bosque nativo afectadas por pardeamiento RevB.pdf](#)

QA/QC procedures applied:	<i>N/A it is only used as a stratification input.</i>
Uncertainty for this parameter:	<i>N/A</i>
Any comment:	The same anomalies raster layer was used to segregate the browning areas in the NREF and Reporting Periods this allows that non-anthropogenic and anthropogenic emissions and removals are kept separate. The segregation considers report all the carbon fluxes which occur in those areas (gain, loss and neutral) from each period and excluding them from the account.

Periodic Annual Increment for mixed forest

Parameter:	Periodic annual increment (PAI) for mixed forest															
Description:	The mixed forest is calculated as a weighted average value of the forest types present in the region and according to the forest surface present for the activity of enhancement of the period (from no forest to native forest).															
Data unit:	Cubic meter per hectare and year (m³ ha⁻¹ year⁻¹)															
Source of data or description of the method for developing the data including the spatial level of the data (local, regional, national, international):	Forest native data are national data and published in INGEI (2020)															
Value applied:	<table><tr><th>Region</th><th>PAI NREF (m³ ha⁻¹ year⁻¹)</th></tr><tr><td>Maule</td><td>2.1</td></tr><tr><td>Ñuble</td><td>2.8</td></tr><tr><td>Biobío</td><td>3.7</td></tr><tr><td>Araucanía</td><td>4.2</td></tr><tr><td>Los Ríos</td><td>4.1</td></tr><tr><td>Los Lagos</td><td>4.2</td></tr></table>		Region	PAI NREF (m³ ha⁻¹ year⁻¹)	Maule	2.1	Ñuble	2.8	Biobío	3.7	Araucanía	4.2	Los Ríos	4.1	Los Lagos	4.2
Region	PAI NREF (m³ ha⁻¹ year⁻¹)															
Maule	2.1															
Ñuble	2.8															
Biobío	3.7															
Araucanía	4.2															
Los Ríos	4.1															
Los Lagos	4.2															
QA/QC procedures applied	SOP_06_Field Operation Manual															
Uncertainty associated with this parameter:	SOP_06 Field Operations Manual was implemented during fieldwork to estimate PAI in the National Forest Inventory, for some forest types were possible to adjust a Probability Distribution Function (PDF). For the forest types with a limited number of sampling plots, uncertainty propagation with Monte Carlo analysis uses the calculation of the measurement uncertainty for PAI based on the 95% CI of the removal rate by forest type, calculated with Continuous Forest Inventory data of INFOR. PAI Mixed Forest = 28.7% (Average of PAI error for all forest types given lack of data.)															
Any comment:																

3.2 Monitored Data and Parameters

a) Deforestation activity MR4

Parameter:	$\Delta A_{TO_OTHERS,i,t}$ = Areas of different Forest Types (i) converted to another category of land use during the 2024 period.																												
Description:	Chile has 11 different Native Forest Type in the PRE area.																												
Data unit:	Total hectares (ha) of the 2024 period.																												
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Forest Type</th><th>Area(ha)</th></tr> <tr> <td>Alerce</td><td>17</td></tr> <tr> <td>Araucaria</td><td>0</td></tr> <tr> <td>Cipres de la Cordillera</td><td>4</td></tr> <tr> <td>Cipres de las Guaitecas</td><td>10</td></tr> <tr> <td>Coihue - Rauli - Tepa</td><td>157</td></tr> <tr> <td>Coihue de Magallanes</td><td>34</td></tr> <tr> <td>Esclerófilo</td><td>180</td></tr> <tr> <td>Lenga</td><td>120</td></tr> <tr> <td>Roble - Hualo</td><td>23</td></tr> <tr> <td>Roble - Rauli - Coihue</td><td>430</td></tr> <tr> <td>Siempreverde</td><td>672</td></tr> <tr> <td>Without Forest Type</td><td>173</td></tr> <tr> <td>Total</td><td>1,820</td></tr> </table>	Forest Type	Area(ha)	Alerce	17	Araucaria	0	Cipres de la Cordillera	4	Cipres de las Guaitecas	10	Coihue - Rauli - Tepa	157	Coihue de Magallanes	34	Esclerófilo	180	Lenga	120	Roble - Hualo	23	Roble - Rauli - Coihue	430	Siempreverde	672	Without Forest Type	173	Total	1,820
Forest Type	Area(ha)																												
Alerce	17																												
Araucaria	0																												
Cipres de la Cordillera	4																												
Cipres de las Guaitecas	10																												
Coihue - Rauli - Tepa	157																												
Coihue de Magallanes	34																												
Esclerófilo	180																												
Lenga	120																												
Roble - Hualo	23																												
Roble - Rauli - Coihue	430																												
Siempreverde	672																												
Without Forest Type	173																												
Total	1,820																												
Source of data and description of measurement/calculation methods and procedures applied:	Matrixes of change in land use taken from land-use change maps. Regional, characterized by stunted, adult, young adult, mixed and young forests converted into areas with no vegetation, urban and industrial areas, waterbodies, areas where succulents, wetlands, scrubland, perennial snow and glaciers, grasslands and farmland have formed.																												
QA/QC procedures applied:	SOP_02_LULUCF Maps Elaboration_ERPA4 SOP_03_ Standardization and quality control protocol for land use change maps QAQC_03_ Standardization and Quality control for land use change maps_ERPA4																												
Uncertainty for this parameter:	The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. The errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013) and the estimator of the total area using the separate ratio estimator (formulas from sec. 6.10 of W.G. Cochran, Sampling Techniques, 3rd Edition, 1977) Error = Maule 128,3%, Ñuble 4,8%, Biobío 0,0%, Araucanía 1,9%, Los Ríos 0,0%, Los Lagos 2,7%.																												
Any comment:	The information presented in this table is a consolidated summary of the data from transitions in section 5.2, organized by forest type. Hectares deforested available on tab "B-NB_RP4_Resumen": total hectares cell G11; Forest type consolidation table: cells B15:C29. Spreadsheet link:																												

	https://plataforma.encrv.cl/static/erpa/mr4/deforestacion/Herramienta_Deforestacion_NR2_MR4_v022.xlsx The error values come from the spreadsheet “U%_2024_v2_ERPA4” tab “resumen” column D. Located in: https://plataforma.encrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_mapas/U%_2024_v2_ERPA4.xlsx More information about the uncertainty process available in: https://plataforma.encrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_mapas/Incertidumbre-Mapas-RP4.zip
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b) Degradation – forest remaining forest MR4

Parameter:	A_{degFF} = area of degradation of forests that remain as forests monitored during the 2024 period.																
Description:	The area was described by degradation of native forest remaining forest in areas not affected by browning (NBA).																
Data unit:	Total hectares (ha) of the 2024 period.																
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Region</th><th>Area (ha)</th></tr> <tr> <td>Maule</td><td>50,359</td></tr> <tr> <td>Ñuble</td><td>23,722</td></tr> <tr> <td>Biobío</td><td>42,004</td></tr> <tr> <td>La Araucanía</td><td>48,294</td></tr> <tr> <td>Los Ríos</td><td>29,940</td></tr> <tr> <td>Los Lagos</td><td>72,654</td></tr> <tr> <td>Total</td><td>266,973</td></tr> </table>	Region	Area (ha)	Maule	50,359	Ñuble	23,722	Biobío	42,004	La Araucanía	48,294	Los Ríos	29,940	Los Lagos	72,654	Total	266,973
Region	Area (ha)																
Maule	50,359																
Ñuble	23,722																
Biobío	42,004																
La Araucanía	48,294																
Los Ríos	29,940																
Los Lagos	72,654																
Total	266,973																
Source of data and description of measurement/calculation methods and procedures applied:	The data comes from INFOR's National Forest Inventory (IFN) plots, combined with spectral information from the Landsat series. This information integrates the variables of the state of the forests on the number of trees per hectare, basal area and volumes recorded by the monitoring of IFN plots, with the spectral data from Landsat to estimate carbon stocks in a spatially explicit way. The estimation of the variation in carbon content on forests that remain as such for FREL/FRL and monitoring report for Degradation, Restoration of Forest remaining forests and Forestry Conservation activities is estimated based on information coming from the Continuous Inventory of Forest Ecosystems and the application of remote sensing techniques on LANDSAT satellite images.																
QA/QC procedures applied:	SOP_05.0_Forest Carbon Flux estimation assessment_ERPA4 SOP_06_Field Operation Manual																
Uncertainty for this parameter:	Degradation mapping accuracy estimated by INFOR. Error: 32.8% ⁵⁷																
Any comment:	The information presented in this table is a consolidated summary of the data from transitions in section 5.2, organized by regions. All information to be considered comes from the sheets whose names end with “_NBA” (areas not affected by browning). Degradation hectares available on tab “DEG_NC_RP4_Resumen_NBA” cells C11:D18, Link to spreadsheet:																

⁵⁷ Spreadsheet with the estimation of error of degradation maps Tab “Resumen” Cell AE441 :
https://plataforma.encrv.cl/static/erpa/mr4/sop/cruce_datos_inventario_vestado.xlsx

	https://plataforma.encrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx Auxiliary methodology presentation: Link: https://plataforma.encrv.cl/static/erpa/mr4/sop/20260528_metodo-degradacion-bm.pptx Link to extract from the final report of degradation methodology: https://plataforma.encrv.cl/static/erpa/mr4/sop/Extracto_INFORME_FIN_AL_INFOR_deg.pdf
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c) Degradation - Substitution activity MR4

Parameter:	A_{DegNFF} = Surface of degradation areas resulting from the conversion of forests into plantations during the 2024 period.																												
Description:	The total of areas by forest type that was degraded to plantation were registered.																												
Data unit:	Total hectares (ha) of the 2024 period.																												
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Forest Type</th><th>Area (ha)</th></tr> <tr><td>Alerce</td><td>0</td></tr> <tr><td>Araucaria</td><td>0</td></tr> <tr><td>Ciprés de la Cordillera</td><td>0</td></tr> <tr><td>Ciprés de las Guaitecas</td><td>0</td></tr> <tr><td>Coihue - Raulí - Tapa</td><td>0</td></tr> <tr><td>Coihue de Magallanes</td><td>0</td></tr> <tr><td>Esclerófilo</td><td>131</td></tr> <tr><td>Lenga</td><td>0</td></tr> <tr><td>Roble - Hualo</td><td>1</td></tr> <tr><td>Roble - Raulí - Coihue</td><td>26</td></tr> <tr><td>Siempreverde</td><td>0</td></tr> <tr><td>Without Forest Type</td><td>32</td></tr> <tr><td>Total</td><td>189</td></tr> </table>	Forest Type	Area (ha)	Alerce	0	Araucaria	0	Ciprés de la Cordillera	0	Ciprés de las Guaitecas	0	Coihue - Raulí - Tapa	0	Coihue de Magallanes	0	Esclerófilo	131	Lenga	0	Roble - Hualo	1	Roble - Raulí - Coihue	26	Siempreverde	0	Without Forest Type	32	Total	189
Forest Type	Area (ha)																												
Alerce	0																												
Araucaria	0																												
Ciprés de la Cordillera	0																												
Ciprés de las Guaitecas	0																												
Coihue - Raulí - Tapa	0																												
Coihue de Magallanes	0																												
Esclerófilo	131																												
Lenga	0																												
Roble - Hualo	1																												
Roble - Raulí - Coihue	26																												
Siempreverde	0																												
Without Forest Type	32																												
Total	189																												
Source of data and description of measurement/calculation methods and procedures applied:	To estimate degradation of native forests converted to plantations, the equation used to estimate deforestation is applied, since it is assumed that, to establish a plantation, all the carbon content present in the preceding native forest must be reduced to zero.																												
QA/QC procedures applied:	SOP_02_LULUCF Maps Elaboration_ERPA4 SOP_03 Standardization and quality control protocol for land use change maps QAQC_03_ Standardization and Quality control for land use change maps_ERPA4																												
Uncertainty for this parameter:	The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. The																												

	errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013) and the estimator of the total area using the separate ratio estimator (formulas from sec. 6.10 of W.G. Cochran, Sampling Techniques, 3rd Edition, 1977). Error = Maule 18,7%, Ñuble 0,0%, Biobío 0,0%, Araucanía 2,4%, Los Ríos 36,3%, Los Lagos 0,0%
Any comment:	The information presented in this table is a consolidated summary of the data from transitions in section 5.2, organized by forest type. Hectares deforested available on tab "B-PL_RP4_Resumen": total hectares cell G11; Forest type consolidation table: cells B15:C29. Spreadsheet link: https://plataforma.enccrv.cl/static/erpa/mr4/sustitucion/Herramienta_Sustitucion_NR2_MR4_v012.xlsx The error values come from the spreadsheet "U%_2024_v2_ERPA4" tab "resumen" column F. Spreadsheet available in: https://plataforma.enccrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_mapas/U%_2024_v2_ERPA4.xlsx More information about the uncertainty process available in: https://plataforma.enccrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_mapas/Incertidumbre-Mapas-RP4.zip

d) Degradation – Forest fire activity MR4

Parameter:	A = Area burned between 2024 in the ERP Regions.																	
Description:	The surface of burned areas was recorded to estimate the degradation of the native forest.																	
Data unit:	Total hectares (ha) of the 2024 period.																	
Value monitored during this Monitoring / Reporting Period:	<table><tr><th>Region</th><th>2024's area (ha)</th></tr><tr><td>Maule</td><td>6,207</td></tr><tr><td>Ñuble</td><td>824</td></tr><tr><td>Biobío</td><td>5,271</td></tr><tr><td>La Araucanía</td><td>18,444</td></tr><tr><td>Los Ríos</td><td>141</td></tr><tr><td>Los Lagos</td><td>3,125</td></tr><tr><td>Total (ha)</td><td>34,011</td></tr></table>		Region	2024's area (ha)	Maule	6,207	Ñuble	824	Biobío	5,271	La Araucanía	18,444	Los Ríos	141	Los Lagos	3,125	Total (ha)	34,011
Region	2024's area (ha)																	
Maule	6,207																	
Ñuble	824																	
Biobío	5,271																	
La Araucanía	18,444																	
Los Ríos	141																	
Los Lagos	3,125																	
Total (ha)	34,011																	
Source of data and description of measurement/calculation methods and procedures applied:	The Forest Fire Protection Department and its Digital Information System for Operations Control (SIDCO), provides annualized statistical information on the occurrence of forest fires for the entire country, which in recent years has been improved by adding the spatial location of fires. SIDCO is a internal system which access is controlled by CONAF.																	
QA/QC procedures applied:	SOP_07_ForestFire_Polygons																	
Uncertainty for this parameter:	Area burned uncertainty estimated by INGEI (2020) Error: 15%																	
Any comment:	Surface of burned area available on tab "Incendios_RP4" cells B25:D31. Link to spreadsheet:																	

	https://plataforma.encrv.cl/static/erpa/mr4/incendios/Herramienta_Incendios_NR2_MR4_v019.xlsx Uncertainty of burned areas corresponding to non-CO2 gases estimated by INGEI (2020) page 413 table 332 4.A.1. Available in: https://snichile.mma.gob.cl/wp-content/uploads/2022/06/Informe_del_Inventario_Nacional_de_GEI_serie_1_990-2018.pdf
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e) Enhancement activity – No forest to native forest MR4

Parameter:	$\Delta A_{TOOTHESi,t}$ = Non-forest land use area converted to forest during the crediting period.																												
Description:	The areas that correspond to non-forest lands were quantified in hectares to later estimate the carbon capture balances of these land changes use. In this data forest plantations with exotic species are included as non-forest land.																												
Data unit:	Total hectares (ha) of the 2024 period.																												
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Forest Type</th><th>Area (ha)</th></tr> <tr><td>Alerce</td><td>0</td></tr> <tr><td>Araucaria</td><td>0</td></tr> <tr><td>Cipres de la Cordillera</td><td>0</td></tr> <tr><td>Cipres de las Guaitecas</td><td>0</td></tr> <tr><td>Coihue - Rauli - Tepa</td><td>0</td></tr> <tr><td>Coihue de Magallanes</td><td>0</td></tr> <tr><td>Esclerófilo</td><td>0</td></tr> <tr><td>Lenga</td><td>0</td></tr> <tr><td>Roble - Hualo</td><td>0</td></tr> <tr><td>Roble - Rauli - Coihue</td><td>0</td></tr> <tr><td>Siempreverde</td><td>0</td></tr> <tr><td>Without Forest Type (mixed forest)</td><td>0</td></tr> <tr><td>Total (ha)</td><td>0</td></tr> </table>	Forest Type	Area (ha)	Alerce	0	Araucaria	0	Cipres de la Cordillera	0	Cipres de las Guaitecas	0	Coihue - Rauli - Tepa	0	Coihue de Magallanes	0	Esclerófilo	0	Lenga	0	Roble - Hualo	0	Roble - Rauli - Coihue	0	Siempreverde	0	Without Forest Type (mixed forest)	0	Total (ha)	0
Forest Type	Area (ha)																												
Alerce	0																												
Araucaria	0																												
Cipres de la Cordillera	0																												
Cipres de las Guaitecas	0																												
Coihue - Rauli - Tepa	0																												
Coihue de Magallanes	0																												
Esclerófilo	0																												
Lenga	0																												
Roble - Hualo	0																												
Roble - Rauli - Coihue	0																												
Siempreverde	0																												
Without Forest Type (mixed forest)	0																												
Total (ha)	0																												
Source of data and description of measurement/calculation methods and procedures applied:	A semi-automated technique is applied to detect changes using satellite images. The Multi-index method or MIICA (Jin et al., 2013) detects land use changes for the period under study. The MIICA methodology is based on the combination of 2 spectral indexes (dNBR, dNDVI) which, through integration rules, provide coverage of land use change, indicating the magnitude and directionality of the change. (Gain and loss). The MIICA methodology used images from the Landsat 8 sensor and was applied through a series of codes in programming language (JavaScript, R) complemented with Google Earth Engine cloud processing, in GIS programs and R software, with the objective of obtaining an efficient land use change map.																												

QA/QC procedures applied:	SOP_02_LULUCF Maps Elaboration_ERPA4 ⁵⁸ SOP_03 Standardization and quality control protocol for land use change maps ⁵⁹ QAQC_03_ Standardization and Quality control for land use change maps_ERPA4 (included in footnote 59)
Uncertainty for this parameter:	The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. The errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013) and the estimator of the total area using the separate ratio estimator (formulas from sec. 6.10 of W.G. Cochran, Sampling Techniques, 3rd Edition, 1977) Error = Maule NA, Ñuble NA, Biobío NA, Araucanía NA, Los Ríos NA Los Lagos NA. The error does not apply because no enhancement activity was mapped.
Any comment:	Forest type consolidation table: cells M06:N018. Spreadsheet link: https://plataforma.encrv.cl/static/erpa/mr4/aumento/Herramienta_Aumentos_NR2_MR4_v033.xlsx The error values come from the spreadsheet “U%_2024_v2_ERPA4” tab “resumen” column B. Spreadsheet available in: https://plataforma.encrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_mapas/U%_2024_v2_ERPA4.xlsx

⁵⁸SOP_02_LULUCF Maps Elaboration_ERPA4: https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_02_MR4.zip

⁵⁹ SOP_03 Standardization and quality control protocol for land use change maps and QAQC_03_ Standardization and Quality control for land use change maps_ERPA4: https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_03_MR4.zip

f) Enhancement activity – forest remains forest in non-conservation areas MR4

Parameter:	A_{EnhFF} = Areas of non-conservation native forest that remains forest during the 2024 period for the six Region of the ERP.																
Description:	The number of hectares of forest that remains as forest during the period 2024 was estimated, in non-conservation areas considering that they are not within an area affected by browning (NBA).																
Data unit:	Total hectares (ha) of the 2024 period.																
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Region</th><th>Area (ha)</th></tr> <tr> <td>Maule</td><td>52,901</td></tr> <tr> <td>Ñuble</td><td>18,517</td></tr> <tr> <td>Biobío</td><td>38,562</td></tr> <tr> <td>La Araucanía</td><td>51,834</td></tr> <tr> <td>Los Ríos</td><td>28,064</td></tr> <tr> <td>Los Lagos</td><td>84,861</td></tr> <tr> <td>Total (ha)</td><td>274,739</td></tr> </table>	Region	Area (ha)	Maule	52,901	Ñuble	18,517	Biobío	38,562	La Araucanía	51,834	Los Ríos	28,064	Los Lagos	84,861	Total (ha)	274,739
Region	Area (ha)																
Maule	52,901																
Ñuble	18,517																
Biobío	38,562																
La Araucanía	51,834																
Los Ríos	28,064																
Los Lagos	84,861																
Total (ha)	274,739																
Source of data and description of measurement/calculation methods and procedures applied:	The data comes from INFOR's IFN plots, combined with spectral information from Landsat series. This information integrates the variables of the state of the forests on the number of trees per hectare and basal area recorded by the monitoring plots, with the spectral data from Landsat to estimate carbon stocks in a spatially explicit way.																
QA/QC procedures applied:	SOP_05_Forest Carbon Flux estimation assessment_ERPA4 ⁶⁰ SOP_06_Field Operation Manual ⁶¹																
Uncertainty for this parameter:	Degradation mapping accuracy estimated by INFOR. Error: 32.8% ⁶²																
Any comment:	All information to be considered comes from the sheets whose names end with “_NBA” (areas not affected by browning). Enhancement hectares available on tab “DEG_NC_RP4_Resumen_NBA” cells H11:I18, Link to spreadsheet: https://plataforma.encrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx The information presented in this table is a consolidated summary of the data from transitions in section 5.2, organized by regions. Auxiliary methodology presentation: Link: https://plataforma.encrv.cl/static/erpa/mr4/sop/20260528_metodo-degradacion-bm.pptx Link to extract from the final report of degradation methodology:																

⁶⁰ SOP_05_Forest Carbon Flux estimation assessment_ERPA4:

https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_05_MR4.zip

⁶¹ SOP_06_Field Operation Manual: https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_06_MR4.zip

⁶² Spreadsheet with the estimation of error of degradation maps Tab “Resumen” Cell AE441:

https://plataforma.encrv.cl/static/erpa/mr4/sop/cruce_datos_inventario_vestado.xlsx

	https://plataforma.encrv.cl/static/erpa/mr4/sop/Extracto_INFORME_FINAL_INFOP_deg.pdf
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g) Conservation activity MR4

Parameter:	$\Delta A_{TO_OTHERS_{i,t}}$ = areas of conservation of native forest that remains as such during the 2024 period in the six Region of the ERP.																
Description:	The areas that in 2024 are forest in conservation area and remain as such.																
Data unit:	Total hectares (ha) of the 2024 period.																
Value monitored during this Monitoring / Reporting Period:	<table> <tr> <th>Region</th><th>Area (ha)</th></tr> <tr> <td>Maule</td><td>2,645</td></tr> <tr> <td>Ñuble</td><td>6,900</td></tr> <tr> <td>Biobío</td><td>11,176</td></tr> <tr> <td>La Araucanía</td><td>23,383</td></tr> <tr> <td>Los Ríos</td><td>26,517</td></tr> <tr> <td>Los Lagos</td><td>113,991</td></tr> <tr> <td>Total (ha)</td><td>184,612</td></tr> </table>	Region	Area (ha)	Maule	2,645	Ñuble	6,900	Biobío	11,176	La Araucanía	23,383	Los Ríos	26,517	Los Lagos	113,991	Total (ha)	184,612
Region	Area (ha)																
Maule	2,645																
Ñuble	6,900																
Biobío	11,176																
La Araucanía	23,383																
Los Ríos	26,517																
Los Lagos	113,991																
Total (ha)	184,612																
Source of data and description of measurement/calculation methods and procedures applied:	The data comes from IFN plots, combined with spectral information from the Landsat series. This information integrates the variables of the state of the forests on the number of trees per hectare and basal area recorded by the monitoring of IFN plots, with the spectral data from Landsat to estimate carbon stocks in a spatially explicit way.																
QA/QC procedures applied:	SOP_05_Forest Carbon Flux estimation assessment_ERPA4 SOP_06_Field Operation Manual																
Uncertainty for this parameter:	Degradation mapping accuracy is estimated by INFOR. Error: 32.8% ⁶³																
Any comment:	All information to be considered comes from the sheets whose names end with “_NBA” (areas not affected by browning). Total degradation hectares available on tab “DEG_CON_RP4_Resumen_NBA” cells M10:N18, Link to spreadsheet: https://plataforma.encrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_Conservacion_NR2_MR4_v17.xlsx The information presented in this table is a consolidated summary of the data from transitions in section 5.2, organized by regions.																

⁶³ Spreadsheet with the estimation of error of degradation maps Tab “Resumen” Cell AE441 :
https://plataforma.encrv.cl/static/erpa/mr4/sop/cruce_datos_inventario_vestado.xlsx

h) Emissions and removals from browning affected forest area MR4

Parameter:	Browning = Areas of native forest remaining forest affected by browning during the 2024 period in the six Region of the ERP.																																			
Description:	The areas that in 2024 are forests affected by browning in forest areas that remain as such.																																			
Data unit:	Total hectares (ha) of the 2024 period.																																			
Value monitored during this Monitoring / Reporting Period:	<table><tr><th>Region</th><th>Degradation (Ha)</th><th>Enhancement (Ha)</th><th>Conservation (Ha)</th></tr><tr><td>Maule</td><td>18,506</td><td>18,186</td><td>858</td></tr><tr><td>Ñuble</td><td>6,252</td><td>5,004</td><td>1,117</td></tr><tr><td>Biobío</td><td>8,866</td><td>8,505</td><td>2,055</td></tr><tr><td>La Araucanía</td><td>6,098</td><td>6,131</td><td>510</td></tr><tr><td>Los Ríos</td><td>2,378</td><td>2,755</td><td>195</td></tr><tr><td>Los Lagos</td><td>1</td><td>0</td><td>0</td></tr><tr><td>Total (ha)</td><td>42,101</td><td>40,581</td><td>4,735</td></tr></table>				Region	Degradation (Ha)	Enhancement (Ha)	Conservation (Ha)	Maule	18,506	18,186	858	Ñuble	6,252	5,004	1,117	Biobío	8,866	8,505	2,055	La Araucanía	6,098	6,131	510	Los Ríos	2,378	2,755	195	Los Lagos	1	0	0	Total (ha)	42,101	40,581	4,735
Region	Degradation (Ha)	Enhancement (Ha)	Conservation (Ha)																																	
Maule	18,506	18,186	858																																	
Ñuble	6,252	5,004	1,117																																	
Biobío	8,866	8,505	2,055																																	
La Araucanía	6,098	6,131	510																																	
Los Ríos	2,378	2,755	195																																	
Los Lagos	1	0	0																																	
Total (ha)	42,101	40,581	4,735																																	
Source of data and description of measurement/calculation methods and procedures applied:	For the fourth monitoring period, the same methodology applied in the NREF, RP1, RP2, RP3 was carried out regarding the segregation of non-anthropogenic emission through the exclusion of the areas affected by browning (BA) in forest remaining forest. These areas are considered as a non-anthropogenic emission source because the carbon fluxes that occur in these areas are not related to human activities as the deforestation activity and t is generated by the decreases in precipitation falls, and water availability. The areas affected by browning correspond to those areas of forest that remain as forests that present phenological anomalies because of the impact of the megadrought. These anomalies were detected in the integral productivity of native forest in the ERP implementation area and are under the 5th percentile data productivity anomaly (GAC,2023). The phenological anomaly results in the desiccation of the crowns, loss of foliage and even the mortality of individuals. The same anomalies raster layer was used to segregate the browning areas in the NREF and Reporting Periods and considers all the carbon fluxes which occur in those areas (gain, loss and neutral) from each period. This allows non-anthropogenic and anthropogenic emissions and removals are kept separate.																																			
QA/QC procedures applied:	The present table corresponds to a post-stratification process; consequently, quality assurance and quality control (QA/QC) procedures are not applied.																																			
Uncertainty for this parameter:	The present table corresponds to a post-stratification process; consequently, uncertainty is not estimated.																																			
Any comment:	Regarding the provisions established towards monitoring browning area recovery, the areas will continue to be monitored as part of the PRE's accounting area in accordance with the established methodology and monitoring plan. These areas are not being excluded and it is expected that, if they remain as forest, the recovery or loss of the stock can be detected, or that emissions can be detected in the event that they are deforested, which will be reported in the fourth monitoring event to guarantee the																																			

	account of emissions resulting from any land use changes and any other anthropogenic activities in the areas affected by browning. Notwithstanding the above, it is not feasible to propose that these areas can recover their initial condition prior to the disturbance, since even if restoration or recovery actions are carried out, there is no certainty of the result they may have in reversing the effect of water deficit and stress. The raster layer of phenological anomalies could be found in the following link: https://plataforma.enccrv.cl/static/erpa/mr2/mapas/BROWNING-MR2.zip All information to be considered comes from the sheets whose names end with “_BA” (areas affected by browning). Conservation values come from tab “DEG_CON_RP4_Resumen_BA”, cell N18. Link to spreadsheets: https://plataforma.enccrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_Conservacion_NR2_MR4_v17.xlsx Degradation and Enhancement values come from tab “DEG_NC_RP4_Resumen_BA”, cells D18 and I18. Link to spreadsheet: https://plataforma.enccrv.cl/static/erpa/mr4/bosque-permanente/Herramienta_BP_No_Conservacion_NR2_MR4_v17.xlsx
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4 QUANTIFICATION OF EMISSION REDUCTIONS⁶⁴

4.1 ER Program Reference level for the Monitoring / Reporting Period covered in this report

Year of Monitoring / Reporting Period t	Average annual historical Emissions from deforestation over the Reference Period (tCO ₂ -e/yr)	If applicable, average annual historical Emissions from forest degradation over the Reference Period (tCO ₂ -e/yr)	If applicable, average annual historical enhanced Removals from afforestation/reforestation (AR) (tCO ₂ -e/yr)	If applicable, average annual historical enhanced Removals from other activities besides A/R (tCO ₂ -e/yr)	Adjustment, if applicable (tCO ₂ -e/yr)	Reference Level (tCO ₂ -e/yr)
2024	5,140,727	11,914,436	-542,444	-10,197,948	0	6,314,771
Total	5,140,727	11,914,436	-542,444	-10,197,948	0	6,314,771

4.2 Estimation of Emissions by Sources and Removals by Sinks included in the ER Program's scope

Year of Monitoring / Report Period t	Emissions from deforestation (tCO ₂ -e/yr)	If applicable, Emissions from forest degradation (tCO ₂ -e/yr)*	If applicable, enhanced Removals from afforestation/reforestation (AR) (tCO ₂ -e/yr)	If applicable, enhanced Removals from other activities besides A/R (tCO ₂ -e/yr)	Net Emissions and Removals (tCO ₂ -e/yr)
2024	1,025,072	55,083,321	-1,058,379	-57,783,962	-2,733,948
Total	1,025,072	55,083,321	-1,058,379	-57,783,962	-2,733,948

⁶⁴ The total untruncated value can be found in: https://plataforma.encrcv.cl/static/erpa/mr4/resultados/Resultados_MRV_ERPA_RP4_v20.xlsx . Automatically truncated values from all the tables from section 4 are available in: https://plataforma.encrcv.cl/static/erpa/mr4/resultados/fcpf_er-mr_template_tool_sections_4_7_8_annex4_RP4_v20.xlsm

4.3 Calculation of Emission Reductions

Total Emissions, Removals and Emission Reductions:

<i>T.1</i>	Deforestation	If applicable, forest degradation	If applicable, enhanced Removals from afforestation/ reforestation (A/R)	If applicable, enhanced Removals from other activities besides A/R*	Adjustment, if applicable	Total (tCO_{2-e})
Emissions or Removals in the Reference Level (tCO_{2-e})	5,140,727	11,914,436	-542,444	-10,197,948	0	6,314,771
Emissions or Removals under the ER Program during the Reporting Period (tCO_{2-e})	1,025,072	55,083,321	-1,058,379	-57,783,962	0	-2,733,948
Emission Reductions during the Reporting Period (tCO_{2-e})	4,115,655	-43,168,885	515,935	47,586,014	0	9,048,719

Annual Emissions, Removals and Emission Reductions:

T.2	Deforestation	If applicable, forest degradation	If applicable, enhanced Removals from afforestation/ reforestation (A/R)	If applicable, enhanced Removals from other activities besides A/R*	Adjustment, if applicable	Total (tCO₂-e)
Year	2024	2024	2024	2024	2024	2024
Emissions or Removals in the Reference Level (tCO₂-e)	5,140,727	11,914,436	-542,444	-10,197,948	0	6,314,771
Emissions or Removals under the ER Program during the Reporting Period (tCO₂-e)	1,025,072	55,083,321	-1,058,379	-57,783,962	0	-2,733,948
Emission Reductions during the Reporting Period (tCO₂-e)	4,115,655	-43,168,885	515,935	47,586,014	0	9,048,719

*Enhanced removals from other activities are generated by the recovery of forests that remain as such, which are below curve B of the Density Management Diagram.

Proportion of Emission Reductions per REDD+ activity:

T.5	Emission Reductions during the Reporting Period (tCO_{2-e})	
	Year	2024
	Total	9,048,719
	Emission Reductions from enhanced Removals from afforestation/reforestation as a percentage of the total FCPF ERs (%)	5.70174629%
	If applicable, enhanced Removals from other activities besides A/R (%)	525.88674706%
	If applicable, forest degradation (%)	-477.07178220%%
	Deforestation (%)	45.48328885%
	Adjustment, if applicable (%)	0.00000000%

T.6	Year	2024
	Emission Reductions from enhanced Removals from afforestation/reforestation as a percentage of the total FCPF ERs (%)	0.00000000%

5 UNCERTAINTY OF THE ESTIMATE OF EMISSION REDUCTIONS

For this monitoring period, was no applied the pro-rata approach

5.1 Identification, assessment and addressing sources of Uncertainty

Sources of uncertainty	Systematic and/or random	Analysis of contribution to overall uncertainty	Contribution to overall uncertainty (High / Low)	Addressed through QA/QC?	Residual uncertainty estimated?
Activity Data					
Measurement	Systematic and random	Land-use and land-use change areas: The Activity Data for deforestation, substitution, restitution, area increase of native forest, and permanent forest lands come from Land-use changes maps. A Protocol have been prepared to facilitate the replication of the mapping steps from the digital processing of satellite images. All procedures required to prepare land-use and land-use change maps are described in the Methodological Protocol for the land-use and land-use change mapping in Native Forest (SOP 02). This protocol includes inputs, data sets, and the methodological steps necessary to generate thematic cartography and statistical reports at the national level on the extension, distribution, and land-use change. The land-use change detection maps are prepared with the Multi-Index Integrated Change Analysis methodology (MIICA - Jin et al., 2013), both for the reference and reporting periods. The application of the MIICA methodology uses the Landsat 7 multipixel mosaics for the reference period and Landsat 8 for the monitoring period. Land-use change control polygons (ground truth) are taken proportionally to each of the regions' surface to establish the spectral thresholds of the zones of change and the evaluated index for each IPCC land-use category. Next, the polygons are verified visually on the time series of high-resolution images provided by the Google Earth software. Finally, land-use allocation of the loss vector layer is done applying a supervised classification method to the multi-pixel mosaic. Additionally, temporal tracking of land-use changes is done by integrating the polygons of areas of change resulting from each monitoring period into the existing layers of change maps. The topological conditions, data geometry, databases, and map attributes are reviewed in detail. Then, any discrepancies or	High	Yes: SOP_01_Satellite mosaic elaboration_ERPA4 QAQC_01_Mosaics elaboration metadata_ERPA4 https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_01_MR4.zip SOP_02_LULUCF Maps Elaboration_ERPA4 https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_02_MR4.zip QAQC_03_Standardization and Quality control for land use change maps_ERPA4 https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_03_MR4.zip	NO

Sources of uncertainty	Systematic and/or random	Analysis of contribution to overall uncertainty	Contribution to overall uncertainty (High / Low)	Addressed through QA/QC?	Residual uncertainty estimated?
		inconsistencies are sent to the responsible team for resolution (SOP 03). After the solution, the inconsistency is double checked. The result of the activity data measurement is reviewed to ensure consistency, according to the sum of REDD+ activities areas and the surface region. This process is applied during the integration of final calculation results, and in case of finding inconsistencies, the integration must stop, and the input data must be verified. Finally, Uncertainties associated with AD are due to the production process of land use maps. The uncertainties of the AD for deforestation, substitution, restitution, area increase of native forest, and permanent forest activities are associated with the errors of the satellite image processing during the preparation of land-use change maps. The uncertainty of land-use change maps is estimated by comparing the results of the land-use change category on the map and the reference observations corresponding to a sample of visually interpreted points. Factors influencing the estimation of uncertainty are the sampling design and the sample size used to assess the precision and accuracy of the maps. The errors related to land-use change are calculated following the Good Practice Guidelines for estimating the precision of change of use described in Olofsson et al. (2013). This approach is applied with the FAO Collect Earth tool. The sample size of the accuracy assessment of the land-use change maps is calculated considering the user's precision parameters for each land use or category of change. These parameters are obtained from a pre-sampling. The sample size is calculated assuming a standard error of the precision of 0.01 using the equation of Cochran (1977). The evaluation points are selected with a stratified random sampling design for each IPCC sub-use in each region.			
Measurement	Systematic and random	Permanent forest degradation and carbon enhancement: The Activity Data for degradation and carbon enhancement in permanent forest lands comes from satellite imaging and NFI biomass information integration. A Protocol has been prepared to facilitate replicating the mapping process from the digital processing of satellite images and NFI biomass information (SOP 05). All procedures are described in the Protocol to prepare	High	Yes, for a and b sources: SOP_05: Forest Carbon Flux estimation assessment_ERPA4 https://plataforma.enccrv.cl/statistic/erpa/mr4/sop/SOP_05_MR4.zip	NO

Sources of uncertainty	Systematic and/or random	Analysis of contribution to overall uncertainty	Contribution to overall uncertainty (High / Low)	Addressed through QA/QC?	Residual uncertainty estimated?
		carbon flux, stock, and degradation mapping in the permanent forest. This protocol includes methods description, spatial and dasometric information, and satellite data processing required to estimate activity data for degradation and carbon enhancement. The sources of error for estimating carbon degradation and enhancement activity data on permanent forest lands are: Uncertainty associated with the forest density charts used to determine the direction of carbon flux (neutral, loss or gain) for each pixel. This uncertainty has been estimated in 32.8%. Uncertainty associated with integrating the multi-pixel mosaic satellite data with the dasometric variables. This uncertainty has been estimated by calculating the Standard Error of Estimation of the volume function k_{nn}. This uncertainty has been estimated in 64.3%.		SOP_06: SOP06 Field Operations Manual https://plataforma.enccrv.cl/static/erpa/mr4/sop/SOP_06_MR4.zip	
Representativeness	Systematic	Land-use and land-use change areas: Multi-pixel mosaics are prepared with a temporal range with cloud-free pixels to obtain representative satellite images of the beginning and end of each period. The multi-pixel mosaic is an image composed of pixels of different images extracted from the definition of a range or time window. The selection of each pixel seeks to define the best information available in a specific area, prioritizing above all that they are pixels free of cloud and cloud shadows. Given the high cloud cover present in southern Chile, a ± 3 months window is used for the start and end date of the analyzed period. For example, considering the period 2024, the start date is January 1, 2024, the range or time window will correspond from October 1, 2023, to March 31, 2024; the multipixel mosaic time window for the end of period (December 31, 2024) is from October 1, 2024, to March 31, 2025.	Low	Yes: SOP_01_Satellite mosaic elaboration_ERPA3 QAQC_01_Mosaics elaboration metadata_ERPA4 https://plataforma.enccrv.cl/static/erpa/mr4/sop/SOP_01_MR4.zip	NO
Sampling	NA	Land-use and land-use change areas: This source of uncertainty is not applicable. It is not required to use a sampling technique to estimate ADs for carbon deforestation, substitution, restitution, area increase of native forest, and permanent forest lands. The AD estimation is made with a total pixel count of the carbon content map for each land-use change category.	NA	NA	NA
	NA	Permanent forest degradation and carbon enhancement: This source of uncertainty is	NA	NA	NA

Sources of uncertainty	Systematic and/or random	Analysis of contribution to overall uncertainty	Contribution to overall uncertainty (High / Low)	Addressed through QA/QC?	Residual uncertainty estimated?
		not applicable. It is not required to use a sampling technique to estimate ADs for carbon degradation and enhancement. The AD estimation is made with a total pixel count of the carbon content map for each flow category (biomass gain or loss).			
Extrapolation	NA	This source of uncertainty is not applicable. Extrapolation is not applied to estimate REDD+ activities, the sample-based estimation area method is not used. All REDD+ activities are calculated from spatially explicit information.	NA	NA	NA
Approach 3	NA	This source of uncertainty is not applicable. Activity data were estimated conducting tracking of lands or IPCC Approach 3 for reference and monitoring periods.	NA	NA	NA
Emission Factor					
BH measurement H measurement Plot delineation Wood density estimation Biomass allometric model	Systematic and Random	Aerial Biomass The measurement uncertainty for aerial biomass estimate depends on the land-use carbon density data source: Aerial biomass of native and mixed forest: SOP_06 Field Operations Manual was implemented during fieldwork for the estimation of AGB in the National Forest Inventory. For some forest types were possible to adjust a Probability Distribution Function (PDF). For the forest types with a limited number of sampling plots, uncertainty propagation with Monte Carlo analysis uses the following information: DBH measurement error (0.2%). Calculation based on Continuous Forest Inventory data of INFOR. Volume estimation error (0.07%). Calculation based on Continuous Forest Inventory data of INFOR. Biomass Expansion Factor (BEF) error (18.0%). BEF comes from information collected in the country from the study of Gayoso et al. (2002) and used in INGEI (2020). This value is for native species and has a national spatial level. Error calculation is based on statistical data from the Biomass Inventory and Carbon Accountancy of the Universidad Austral de Chile (UACH). Wood Density (5.6%). Calculated using basic density data collected from native species growing in Chile. A bibliographic review of basic densities of the forest species in Chile was carried out and there were no modifications for the value exposed from Gayoso et al. (2002) and INGEI (2020).	Low	Yes, for a: SOP_06: Field Operation Manual https://plataforma.encrv.cl/static/erpa/mr4/sop/SOP_06_MR4.zip	Yes

Sources of uncertainty	Systematic and/or random	Analysis of contribution to overall uncertainty	Contribution to overall uncertainty (High / Low)	Addressed through QA/QC?	Residual uncertainty estimated?
		Finally, these uncertainties are combined following IPCC approach 1 (propagation of error), resulting in total uncertainty of 18.85%. Aerial biomass of non-forest uses: Monte Carlo analysis uses error estimation published in INGEI (2020) and Gayoso (2006) and Expert judgment estimates (IPCC, 2006). The error of carbon density for wetlands, water bodies, and other non-vegetations uses was assumed zero due to a lack of data. Annual Periodic Increment (IPA Spanish acronym): SOP_06 Field Operations Manual was implemented during fieldwork to estimate IPA in the National Forest Inventory, for some forest types were possible to adjust a Probability Distribution Function (PDF). For the forest types with a limited number of sampling plots, uncertainty propagation with Monte Carlo analysis uses the calculation of the measurement uncertainty for IPA based on the 95% CI of the removal rate by forest type, calculated with Continuous Forest Inventory data of INFOR.			
Sampling	Random	The Continuous Inventory of Forestry Ecosystems, henceforth referred to as the Continuous Inventory, managed by INFOR, and has been operational since 2000. The Continuous Inventory was designed under a statistical bi-stage design in three circular sample plot clusters in an area equivalent to 500m² distributed in a systematic area of 5x7km. The sampling units have been systematically distributed over the national territory from the Maule to the Magallanes region.	High	Yes: QA / QC applied in SOP06 https://plataforma.enccrv.cl/statistic/erpa/mr4/sop/SOP_06_MR4.zip	Yes
Other parameters (e.g. Carbon Fraction, root-to-shoot ratios)	Systematic and Random	Root-to-shoot ratio (R factor-40% error): R factor comes from information collected in the country (Gayoso et al., 2002; INGEI, 2020). This value is within the range indicated in the 2006 IPCC Guidelines for temperate forests (between 0.20 and 0.46, according to Table 4.4; Chapter 4; Volume 4) and within of the values available worldwide, which provide R factors that range between 0.09 and 0.33. This value is for native species and has a national spatial level, and was selected to the GHG national report Error calculation based on statistical data from the Biomass Inventory and Carbon Accountancy of the Universidad Austral de Chile (UACH). Finally, aerial biomass and R factor uncertainties are combined following IPCC	High	Yes Semi-automated tools were developed to reduce potential errors in integration & calculations	Yes

Sources of uncertainty	Systematic and/or random	Analysis of contribution to overall uncertainty	Contribution to overall uncertainty (High / Low)	Addressed through QA/QC?	Residual uncertainty estimated?
		approach 1 (propagation of error), resulting in total uncertainty of 44.2%.			
Representativeness	NA	This source of uncertainty is not applicable. Chile generates estimates of carbon densities per forest type, and non-forest land uses. Different forest types and structures classify the native forest. Each forest type has its biomass value depending on data availability. Also, non-forest lands include the following uses: Urban and Industrial Areas, agricultural land, grassland, scrub, arborescent scrub, shrub planting, succulent scrub, succulent formations, plantations, wetlands, areas deprived of vegetation, eternal snows and glaciers, waterbodies and unrecognized areas.	NA	NA	NA
Integration					
Model	Systematic	Calculation tools have been prepared to estimate Emission Reductions, including the FREL and Monitoring Period for REDD activity. In these tools, you can review the formulas used to estimate ERs. The country prepared these tools to ensure the same calculation methods are applied for all monitoring events and avoid errors during the processing and data preparation.	Low	Yes Semi-automated tools were developed to reduce potential errors in integration & calculations	No
Integration	Systematic	The Emission factors were calculated for each region and forest type according to AGB sampling plots' location to assure the comparability between transition classes of the Activity Data and those of the Emission Factors. This source of uncertainty is considered in the sampling error of the AGB inventory.	Low	Yes: SOP_06_Field Operation Manual https://plataforma.encrv.cl/stat/erpa/mr4/sop/SOP_06_MR4.zip	No

5.2 Uncertainty of the estimate of Emission Reductions⁶⁵

Parameters and assumptions used in the Monte Carlo method

The following table shows the parameters and assumptions used in the Monte Carlo Analysis to estimate the uncertainty of the Emission Reduction for the Monitoring Period. The parameter where the type of Probability Distribution Function (PDF) is fitted indicates the p-value of the adjustment obtained for the distribution function and its parameters.

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
Activity Data				
Non-Forest land - Forest Maule Reference Period (ha/yr)	6.239	24.8%	Normal	Activity Data uncertainty used in Monte Carlo Analysis was calculated using the confidence limits of the sampling-based land-use change estimation areas for the reference and monitoring periods.
Non-Forest land - Forest Ñuble Reference Period (ha/yr)	546	87.1%	Normal	
Non-Forest land - Forest Biobio Reference Period (ha/yr)	1.795	87.9%	Normal	
Non-Forest land - Forest Araucanía Reference Period(ha/yr))	2.545	130.8%	Normal	
Non-Forest land - Forest Los Ríos Reference Period (ha/yr)	1.468	61.4%	Normal	
Non-Forest land - Forest Los Lagos Reference Period (ha/yr)	929	67.9%	Normal	
Forest land – Non-Forest Maule Reference Period (ha/yr)	634	47.0%	Normal	
Forest land – Non-Forest Ñuble Reference Period (ha/yr)	424	60.3%	Normal	
Forest land – Non-Forest Biobio Reference Period (ha/yr)	1.147	95.3%	Normal	
Forest land – Non-Forest Araucanía Reference Period(ha/yr))	1.319	221.1%	Normal	
Forest land – Non-Forest Los Ríos Reference Period (ha/yr)	1.281	99.8%	Normal	
Forest land – Non-Forest Los Lagos Reference Period (ha/yr)	3,256	33.0%	Normal	
Forest land – Non-Forest Maule Monitoring Period (ha/yr)	216	128,3%	Normal	

⁶⁵ Map uncertainty estimation available in:

https://plataforma.encrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_mapas/Incertidumbre-Mapas-RP4.zip

Global uncertainty estimation available in:

https://plataforma.encrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_global/Incertidumbre-Global-RP4.zip

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
Forest land – Non-Forest Ñuble Monitoring Period (ha/yr)	120	4,8%	Normal	
Forest land – Non-Forest Biobio Monitoring Period (ha/yr)	70	0,0%	Normal	
Forest land – Non-Forest Araucanía Monitoring Period (ha/yr)	235	1,9%	Normal	
Forest land – Non-Forest Los Ríos Monitoring Period (ha/yr)	208	0,0%	Normal	
Forest land – Non-Forest Los Lagos Monitoring Period (ha/yr)	971	2,7%	Normal	
Aum No Conserv Bajo C en 2001, entre [B-C] en 2010 RP (ha/yr)	47,034	32.8%	Normal	Degradation mapping accuracy estimated by INFOR.
Aum No Conserv Entre [B-C] en 2001 y sobre B en 2010 RP (ha/yr)	165,411	32.8%	Normal	
Aum No Conserv Bajo C en 2001 y sobre B en 2010 RP (ha/yr)	162,204	32.8%	Normal	
Aum No Conserv Bajo C en 2001 y bajo C en 2010 RP (ha/yr)	66.668	32.8%	Normal	
Aum No Conserv Entre [B-C] en 2001, entre [B-C] en 2010 RP (ha/yr)	21,878	32.8%	Normal	
Aum No Conserv Bajo C en enero 2024, entre [B-C] en diciembre 2024 MP (ha/yr)	26,998	32.8%	Normal	
Aum No Conserv Entre [B-C] en enero 2024 y sobre B en diciembre 2024 MP (ha/yr)	105,199	32.8%	Normal	
Aum No Conserv Bajo C en enero 2024 y sobre B en diciembre 2024 MP (ha/yr)	81,734	32.8%	Normal	
Aum No Conserv Bajo C enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	43,661	32.8%	Normal	
Aum No Conserv Entre [B-C] enero 2024, entre [B-C] en diciembre 2024 MP (ha/yr)	17,147	32.8%	Normal	
Deg No Conserv Sobre B en 2001 y bajo C en 2010 RP (ha/yr)	105,699	32.8%	Normal	
Deg No Conserv Entre [B-C] en 2001 y bajo C en 2010 RP (ha/yr)	38,888	32.8%	Normal	
Deg No Conserv Sobre B en 2001, Entre [B-C] en 2010 RP (ha/yr)	129,910	32.8%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
Deg No Conserv Bajo C en 2001 y bajo C en 2010 RP (ha/yr)	62,074	32.8%	Normal	
Deg No Conserv Entre [B-C] en 2001, entre [B-C] en 2010 RP (ha/yr)	20,919	32.8%	Normal	
Deg No Conserv Sobre B en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	76,975	32.8%	Normal	
Deg No Conserv Entre [B-C] en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	27,669	32.8%	Normal	
Deg No Conserv Sobre B en enero 2024, Entre [B-C] en diciembre 2024 MP (ha/yr)	102,703	32.8%	Normal	
Deg No Conserv Bajo C en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	43,025	32.8%	Normal	
Deg No Conserv Entre [B-C] en enero 2024, entre [B-C] en diciembre 2024 MP (ha/yr)	16,601	32.8%	Normal	
Aum Conserv Bajo C en 2001, entre [B-C] en 2010 RP (ha/yr)	8,479	32.8%	Normal	
Aum Conserv Entre [B-C] en 2001 y sobre B en 2010 RP (ha/yr)	35,783	32.8%	Normal	
Aum Conserv Bajo C en 2001 y sobre B en 2010 RP (ha/yr)	24,973	32.8%	Normal	
Aum Conserv Bajo C en 2001 y bajo C en 2010 RP (ha/yr)	10,996	32.8%	Normal	
Aum Conserv Entre [B-C] en 2001, entre [B-C] en 2010 RP (ha/yr)	5,204	32.8%	Normal	
Aum Conserv Bajo C en enero 2024, entre [B-C] en diciembre 2024 MP (ha/yr)	9,038	32.8%	Normal	
Aum Conserv Entre [B-C] en enero 2024 y sobre B en diciembre 2024 MP (ha/yr)	38,202	32.8%	Normal	
Aum Conserv Bajo C en enero 2024 y sobre B en diciembre 2024 MP (ha/yr)	28,137	32.8%	Normal	
Aum Conserv Bajo C en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	13,662	32.8%	Normal	
Aum Conserv Entre [B-C] en 202 en enero 2024 3, entre [B-C] en diciembre 2024 MP (ha/yr)	5,857	32.8%	Normal	
Deg Conserv Sobre B en 2001 y bajo C en 2010 RP (ha/yr)	25.257	32.8%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
Deg Conserv Entre [B-C] en 2001 y bajo C en 2010 RP (ha/yr)	7.991	32.8%	Normal	
Deg Conserv Sobre B en 2001, Entre [B-C] en 2010 RP (ha/yr)	36.182	32.8%	Normal	
Deg Conserv Bajo C en 2001 y bajo C en 2010 RP (ha/yr)	10.415	32.8%	Normal	
Deg Conserv Entre [B-C] en 2001, entre [B-C] en 2010 RP (ha/yr)	4,987	32.8%	Normal	
Deg Conserv Sobre B en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	25,783	32.8%	Normal	
Deg Conserv Entre [B-C] en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	8,493	32.8%	Normal	
Deg Conserv Sobre B en enero 2024, Entre [B-C] en diciembre 2024 MP (ha/yr)	37,556	32.8%	Normal	
Deg Conserv Bajo C en enero 2024 y bajo C en diciembre 2024 MP (ha/yr)	12,119	32.8%	Normal	
Deg Conserv Entre [B-C] en enero 2024, entre [B-C] en diciembre 2024 MP (ha/yr)	5,765	32.8%	Normal	
Forest land - Forest Plantation Maule RP (ha/yr)	1,846	49.1%	Normal	Activity Data uncertainty used in Monte Carlo Analysis was calculated using the confidence limits of the sampling-based land-use change estimation areas for the reference and monitoring periods.
Forest land - Forest Plantation Ñuble RP (ha/yr)	771	70.5%	Normal	
Forest land - Forest Plantation Bío-Bío RP (ha/yr)	1,478	78.3%	Normal	
Forest land - Forest Plantation La Araucanía RP (ha/yr)	2,732	43.9%	Normal	
Forest land - Forest Plantation Los Ríos RP (ha/yr)	894	61.9%	Normal	
Forest land - Forest Plantation Los Lagos RP (ha/yr)	609	76.9%	Normal	
Forest land - Forest Plantation Maule MP (ha/yr)	110	18.7%	Normal	
Forest land - Forest Plantation Ñuble MP (ha/yr)	40	0.0%	Normal	
Forest land - Forest Plantation Bío-Bío MP (ha/yr)	12	0.0%	Normal	
Forest land - Forest Plantation La Araucanía MP (ha/yr)	24	2.4%	Normal	
Forest land - Forest Plantation Los Ríos MP (ha/yr)	3	36.3%	Normal	
Forest land - Forest Plantation Los Lagos MP (ha/yr)	1	0.0%	Normal	
Forest fires area Maule RP (ha/yr)	583.4	15%	Normal	INGEI, 2020
Forest fires area Ñuble RP (ha/yr)	139.2	15%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
Forest fires area Biobio RP (ha/yr)	1,028.5	15%	Normal	
Forest fires area Araucanía RP (ha/yr)	2,058.1	15%	Normal	
Forest fires area Los Ríos RP (ha/yr)	150.4	15%	Normal	
Forest fires area Los Lagos RP (ha/yr)	781.9	15%	Normal	
Forest fires area Maule MP (ha/yr)	6,207.3	15%	Normal	
Forest fires area Ñuble MP (ha/yr)	824.0	15%	Normal	
Forest fires area Biobio MP(ha/yr)	5,271.5	15%	Normal	
Forest fires area Araucanía MP(ha/yr)	18,443.6	15%	Normal	
Forest fires area Los Ríos MP(ha/yr)	140.7	15%	Normal	
Forest fires area Los Lagos MP(ha/yr)	3,124.8	15%	Normal	
Carbon content of Non-Forest Lands				
AGB Áreas Urbanas e Industriales	2.00	95%	Normal	(INGEI, 2020)
AGB Terrenos Agrícolas	10.00	75%	Normal	(INGEI, 2020)
AGB Praderas y Matorrales Praderas	4.73	27.7%	Normal	(Gayoso, 2006)
AGB Praderas y Matorrales Matorral-Pradera	9.04	34.6%	Normal	
AGB Praderas y Matorrales Matorral Arborescente	21.78	22.4%	Normal	
Carbon content of Native Forest				
BGB Terrenos Agrícolas	2.00	53.2%	Normal	Uncertainty for BGB of Non-Forest lands is based on propagation error estimate following IPCC approach 1 of Matorrals-Arborescente AGB error (22.42%) and Root shoot ratio -R Factor error (48.27%) estimated by Goyoso et al. (2002), resulting in total uncertainty of 53.2%.
BGB Praderas y Matorrales Praderas	8.13	53.2%	Normal	
BGB Praderas y Matorrales Matorral-Pradera	14.99	53.2%	Normal	
BGB Praderas y Matorrales Matorral Arborescente	35.25	53.2%	Normal	
AGB Alerce Adulto (t dry biomass/ha)	339.109	18.85%	Normal	For the forest types with a limited number of sampling plots, uncertainty propagation
AGB Alerce Renoval (t dry biomass/ha)	203.590	18.85%	Normal	
AGB Ciprés de las Guaitecas Adulto (t dry biomass/ha)	221.848	18.85%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
AGB Araucaria Adulto (t dry biomass/ha)	β : 222.628; k: 1.886	PDF	Gama 2; P:0.998; n: 16	with Monte Carlo analysis uses the following information: i. DBH measurement error (0.2%), calculation based on Continuous Forest Inventory data of INFOR; ii. Volume estimation error (0.07%), calculation based on Continuous Forest Inventory data of INFOR, iii. Biomass Expansion Factor (BEF) error (18.0%), BEF comes from information collected in the country from the study of Gayoso et al. (2002) and used in INGEI (2018). This value is for native species and has a national spatial level. Error calculation is based on statistical data from the Biomass Inventory and Carbon Accountancy of the Universidad Austral de Chile (UACH); and iv. Wood Density (5.6%) calculated using basic density data collected from native species growing in Chile. Finally, these uncertainties are combined following IPCC approach 1 (propagation of error), resulting in total uncertainty of 18.85%
AGB Araucaria Renoval (t dry biomass/ha)	219.131	18.85%	Normal	
AGB Ciprés de la Cordillera Adulto (t dry biomass/ha)	97.116	18.85%	Normal	
AGB Ciprés de la Cordillera Renoval (t dry biomass/ha)	124.019	18.85%	Normal	
AGB Lenga Adulto (t dry biomass/ha)	μ : 207.038; s: 84.017	PDF	Logistic; P:0.958; n:10	
AGB Lenga Renoval (t dry biomass/ha)	α : 0.431; β :0.439	PDF	Beta4; P:0.776; n:8	
AGB Coihue de Magallanes Adulto (t dry biomass/ha)	129.148	18.85%	Normal	
AGB Roble - Hualo Adulto (t dry biomass/ha)	β : 17.695; k: 5.884	PDF	Gamma (2); P:0.808; n: 17	
AGB Roble - Raulí - Coihue Adulto (t dry biomass/ha)	λ : 0.006	PDF	Exponential; P:0.850; n: 65;	
AGB Roble - Raulí - Coihue Renoval (t dry biomass/ha)	λ : 0.006	PDF	Exponential; P:0.709; n: 71	
AGB Coihue - Raulí - Tepa Adulto (t dry biomass/ha)	β : 1.162; γ :414.153	PDF	Weibull (2); P: 0.831; n: 57	
AGB Coihue - Raulí - Tepa Renoval (t dry biomass/ha)	β : 117.880; k: 1.720	PDF	Gamma (2); P:0.989; n: 12	
AGB Esclerófilo Adulto (t dry biomass/ha)	β : 0.721; γ :12.840	PDF	Weibull (2); P: 0.858; n: 33	
AGB Siempreverde Adulto (t dry biomass/ha)	μ : 5.765; σ : 0.646	PDF	Log-normal; P: 0.194; n: 49	
AGB Siempreverde Renoval (t dry biomass/ha)	β : 1.584; γ :139.543	PDF	Weibull (2); P: 0.673; n: 25	
AGB Araucanía Mixed Forest Monitoring Period (t dry biomass/ha)	161.36	18.85%	Normal	
AGB Los Ríos Mixed Forest Monitoring Period (t dry biomass/ha)	92.37	18.85%	Normal	
AGB Los Lagos Mixed Forest Monitoring Period (t dry biomass/ha)	211.76	18.85%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
AGB Ñuble Mixed Forest Monitoring Period (t dry biomass/ha)	99.02	18.85%	Normal	
AGB Maule Mixed Forest Monitoring Period (t dry biomass/ha)	46.16	18.85%	Normal	
AGB Biobio Mixed Forest Monitoring Period (t dry biomass/ha)	65.91	18.85%	Normal	
AGB Maule Mixed Forest Reference Period (t dry biomass/ha)	69.85	18.85%	Normal	
AGB Biobio Mixed Forest Reference Period (t dry biomass/ha)	222.86	18.85%	Normal	
AGB Araucanía Mixed Forest Reference Period (t dry biomass/ha)	255.00	18.85%	Normal	
AGB Los Ríos Mixed Forest Reference Period (t dry biomass/ha)	192.95	18.85%	Normal	
AGB Los Lagos Mixed Forest Reference Period (t dry biomass/ha)	221.75	18.85%	Normal	
AGB Ñuble Mixed Forest Reference Period (t dry biomass/ha)	162.94	18.85%	Normal	
BGB Araucanía Mixed Forest Monitoring Period (t dry biomass/ha)	46.29	44.2%	Normal	Uncertainty for Below Ground Biomass BGB is based on propagation error estimate following IPCC approach 1 of Above Ground Biomass-AGB error (18.85%) and Root shoot ratio -R Factor error (40.0%) estimated by Gayoso et al. (2002), resulting in total uncertainty of 44.2%.
BGB Los Ríos Mixed Forest Monitoring Period (t dry biomass/ha)	53.00	44.2%	Normal	
BGB Los Lagos Mixed Forest Monitoring Period (t dry biomass/ha)	60.75	44.2%	Normal	
BGB Ñuble Mixed Forest Monitoring Period (t dry biomass/ha)	28.41	30.47	Normal	
BGB Maule Mixed Forest Monitoring Period (t dry biomass/ha)	13.24	44.2%	Normal	
BGB Biobio Mixed Forest Monitoring Period (t dry biomass/ha)	37.82	44.2%	Normal	
BGB Maule Mixed Forest Reference Period (t dry biomass/ha)	20.04	44.2%	Normal	
BGB Biobio Mixed Forest Reference Period (t dry biomass/ha)	63.94	44.2%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
BGB Araucanía Mixed Forest Reference Period (t dry biomass/ha)	73.16	44.2%	Normal	
BGB Los Ríos Mixed Forest Reference Period (t dry biomass/ha)	55.36	44.2%	Normal	
BGB Los Lagos Mixed Forest Reference Period (t dry biomass/ha)	63.62	44.2%	Normal	
BGB Ñuble Mixed Forest Reference Period (t dry biomass/ha)	46.75	44.2%	Normal	
Dead matter Araucanía Mixed Forest MP (t dry biomass/ha)	57.90	28.4%	Normal	Error estimated from permanent plots of the INFOR Continuous Forest Inventory
Dead matter Los Ríos Mixed Forest MP (t dry biomass/ha)	58.63	28.4%	Normal	
Dead matter Los Lagos Mixed Forest MP (t dry biomass/ha)	65.01	28.4%	Normal	
Dead matter Ñuble Mixed Forest MP (t dry biomass/ha)	36.49	28.4%	Normal	
Dead matter Maule Mixed Forest MP (t dry biomass/ha)	18.97	28.4%	Normal	
Dead matter Biobio Mixed Forest MP (t dry biomass/ha)	49.18	28.4%	Normal	
Dead matter Maule Mixed Forest RP (t dry biomass/ha)	21.35	28.4%	Normal	
Dead matter Biobio Mixed Forest RP (t dry biomass/ha)	52.84	28.4%	Normal	
Dead matter Araucanía Mixed Forest RP (t dry biomass/ha)	74.08	28.4%	Normal	
Dead matter Los Ríos Mixed Forest RP (t dry biomass/ha)	52.99	28.4%	Normal	
Dead matter Los Lagos Mixed Forest RP (t dry biomass/ha)	61.87	28.4%	Normal	
Dead matter Ñuble Mixed Forest RP (t dry biomass/ha)	47.76	28.4%	Normal	
Annual Periodic Increase of Native Forest				
IPA Araucanía Mixed Forest Monitoring Period (t dry biomass/ha)	4.10	28.7%	Normal	Average of IPA error for all forest types given lack of data.
IPA Los Ríos Mixed Forest Monitoring Period (t dry biomass/ha)	4.10	28.7%	Normal	
IPA Los Lagos Mixed Forest Monitoring Period (t dry biomass/ha)	4.89	28.7%	Normal	
IPA Ñuble Mixed Forest Monitoring Period (t dry biomass/ha)	2.44	28.7%	Normal	
IPA Maule Mixed Forest Monitoring Period (t dry biomass/ha)	4.24	28.7%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
IPA Biobio Mixed Forest Monitoring Period (t dry biomass/ha)	3.97	28.7%	Normal	
IPA Maule Mixed Forest Reference Period (t dry biomass/ha)	2.06	28.7%	Normal	
IPA Biobio Mixed Forest Reference Period (t dry biomass/ha)	3.71	28.7%	Normal	
IPA Araucanía Mixed Forest Reference Period (t dry biomass/ha)	4.19	28.7%	Normal	
IPA Los Ríos Mixed Forest Reference Period (t dry biomass/ha)	4.14	28.7%	Normal	
IPA Los Lagos Mixed Forest Reference Period (t dry biomass/ha)	4.17	28.7%	Normal	
IPA Ñuble Mixed Forest Reference Period (t dry biomass/ha)	2.77	28.7%	Normal	
IPA Alerce Adulto (m3/ha/yr)	0.5	58.47%	Normal	The higher uncertainty of the errors estimated for IPA is assumed due to a lack of data.
IPA Ciprés de las Guaitecas Adulto (m3/ha/yr)	3.9	58.47%	Normal	
IPA Araucaria Adulto (m3/ha/yr)	μ : 4.882; σ : 2.516	PDF	Normal; P:0.923; n: 16	
IPA Ciprés de la Cordillera Adulto (m3/ha/yr)	5.0	15.83%	Normal	Error estimated from permanent plots of the INFOR Continuous Forest Inventory
IPA Ciprés de la Cordillera Renoval (m3/ha/yr)	2.7	9.97%	Normal	
IPA Lenga Adulto (m3/ha/yr)	k: 5; γ :0.921	PDF	Erlang; P:0.986; n:10	
IPA Lenga Renoval (m3/ha/yr)	μ : 2.995; β :2.054	PDF	Fisher-Tippett (2); P:0.907; n:8	
IPA Coihue de Magallanes Adulto (m3/ha/yr)	2.6	13.42%	Normal	Error estimated from permanent plots of the INFOR Continuous Forest Inventory
IPA Coihue de Magallanes Renoval (m3/ha/yr)	3.7	7.68%	Normal	
IPA Roble - Hualo Adulto (m3/ha/yr)	μ : 1.534; σ : 0.507	PDF	Log Normal; P:0.873; n: 17	
IPA Roble - Hualo Renoval (m3/ha/yr)	3.5	54.47%	Normal	The higher uncertainty of the errors estimated for IPA is assumed due to a lack of data.

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
IPA Roble - Raulí - Coihue Adulto (m3/ha/yr)	μ : 1.335; σ : 1.106	PDF	Log Normal; P:0.257; n: 65;	
IPA Roble - Raulí - Coihue Renoval (m3/ha/yr)	β : 1.777; γ :4.664	PDF	Weibull (2); P:0.760; n: 71	
IPA Coihue - Raulí - Tapa Adulto (m3/ha/yr)	β : 1.403; γ :6.264	PDF	Weibull (2); P: 0.789; n: 57	
IPA Coihue - Raulí - Tapa Renoval (m3/ha/yr)	μ : 4.364; s : 1.558	PDF	Logistic; P:0.825; n: 12	
IPA Esclerófilo Adulto (m3/ha/yr)	β : 0.667; γ :0/875	PDF	Weibull (2); P: 0.512; n: 33	
IPA Esclerófilo Renoval (m3/ha/yr)	1.6	21.31%	Normal	Error estimated from permanent plots of the INFOR Continuous Forest Inventory
IPA Siempreverde Adulto (m3/ha/yr)	α : 13.411; β :29.589	PDF	Beta4; P: 0.940; n: 49	
IPA Siempreverde Renoval (m3/ha/yr)	μ : 4.664; s :0/893	PDF	Logistic; P: 0.994; n: 25	
Degradation and Enhancement in permanent forest				
Carbon stock change in permanent forest	Values depending on density diagram change and forest type	64.3%	Normal	Error estimation based on the standard error of the k-nn algorithm volume estimation.
Carbon content of forest lands (forest fires)				
AGB Maule (t dry biomass/ha/yr)	80.35	18.85%	Normal	This uncertainty is estimated following IPCC approach 1 (propagation of error), resulting in total uncertainty of 18.85%.
AGB Biobio (t dry biomass/ha/yr)	149.88	18.85%	Normal	
AGB Araucanía (t dry biomass/ha/yr)	252.33	18.85%	Normal	
AGB Los Ríos (t dry biomass/ha/yr)	310.35	18.85%	Normal	
AGB Los Lagos (t dry biomass/ha/yr)	230.41	18.85%	Normal	
AGB Ñuble (t dry biomass/ha/yr)	149.88	18.85%	Normal	
BGB Maule (t dry biomass/ha/yr)	23.05	44.2%	Normal	Uncertainty for Below Ground Biomass BGB is based on
BGB Biobio (t dry biomass/ha/yr)	43.00	44.2%	Normal	

Parameter included in the model	Parameter values	Error sources quantified in the model	Probability distribution function	Assumptions
BGB Araucanía (t dry biomass/ha/yr)	72.39	44.2%	Normal	propagation error estimate following IPCC approach 1 of Above Ground Biomass-AGB error (18.85%) and Root shoot ratio -R Factor error (40.0%) estimated by Gayoso et al. (2002), resulting in total uncertainty of 44.2%.
BGB Los Ríos (t dry biomass/ha/yr)	89.04	44.2%	Normal	
BGB Los Lagos (t dry biomass/ha/yr)	66.10	44.2%	Normal	
BGB Ñuble (t dry biomass/ha/yr)	43.00	44.2%	Normal	
Dead matter Maule (t dry biomass/ha)	52.60	28.4%	Normal	Error estimated from permanent plots of the INFOR Continuous Forest Inventory
Dead matter Biobio (t dry biomass/ha)	122.10	28.4%	Normal	
Dead matter Araucanía (t dry biomass/ha)	165.50	28.4%	Normal	
Dead matter Los Ríos (t dry biomass/ha)	146.90	28.4%	Normal	
Dead matter Los Lagos (t dry biomass/ha)	157.00	28.4%	Normal	
Dead matter Ñuble (t dry biomass/ha)	122.10	28.4%	Normal	
Other Factors				
Combustion factor	0.45	36.0%	Normal	IPCC, 2006
Emission Factor CH4	4.7	29.0%	Normal	
Emission Factor N2O	0.26	43.8%	Normal	

Quantification of the Uncertainty of the estimate of Emission Reductions ⁶⁶

		Reporting Period		Crediting Period	
		Total Emission Reductions*	Forest degradation**	Total Emission Reductions*	Forest degradation**
A	Median	6,586,528	3,015,835	7,827,187	-58,619,589
B	Upper bound 90% CI (Percentile 0.95)	10,019,188	5,766,806	55,179,242	-27,640,918
C	Lower bound 90% CI (Percentile 0.05)	4,094,964	1,512,774	-38,942,692	-88,093,600
D	Half Width Confidence Interval at 90% (B – C) / 2	2,962,112	2,127,016	47,060,966	-25,972,310
E	Relative margin (D / A)	45.0%	70.5%	261.8%	28.0%
F	Uncertainty discount	15%	NA	15%	NA

*Remove forest degradation from the estimate if forest degradation has been estimated with proxy data.

**Remove the column if forest degradation has not been estimated using proxy data.

5.3 Sensitivity analysis and identification of areas of improvement of MRV system⁶⁷

The following table shows the results for the sensitivity analysis of Emission Reductions (ERs) uncertainty. ERs estimate of carbon enhancement contributes 102.4% ERs uncertainty. The main contribution is coming from ERs' uncertainty in removals in forest remaining forest, with the 87.6%.

Consistent with previous reporting periods, uncertainty analysis regarding activities in forests that remain classified as forests is primarily affected by degradation and enhancement processes. The considerable variability inherent in these methods presents substantial challenges for the preparation of activity data within the NFMS framework.

REDD Activity	Component	Uncertainty Contribution
Carbon enhancement	Removals in forest remaining as forest	87.6%
	Removals in lands converted to forest	14.8%
Total removals		102.4%
Conservation	Removals in forest remaining as forest	74.8%
	Emissions in forest remaining as forest	44.3%
Conservation Total		119.2%
Deforestation Total		26.8%
Degradation	Emissions in forest remaining as forest	83.5%
	Emissions from forests converted to plantations.	28.4%
	Forest fires	2.3%
Degradation Total		114.2%
Grand Total		362.5%

⁶⁶ Values from **Total Emission Reductions** come from tab "RP1-RP2-RP3-RP4" and values from Forest degradation come from tab "Degradacion" both of them from the spreadsheet available in:

https://plataforma.enccrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_global/Incertidumbre_acumulada_Chile_RP4_v1.xlsx

For more information consult tab "Incertidumbre y Sensibilidad" from Cells C4:C8; D4:D8:

https://plataforma.enccrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_global/IncertidumbreGlobal_RP4_v1.xlsx

⁶⁷ Values from table 1 come from tab "Incertidumbre y Sensibilidad" cells Q13:T22. Grand total cell S22 from spreadsheet:

https://plataforma.enccrv.cl/static/erpa/mr4/analisis-incertidumbre/incertidumbre_global/IncertidumbreGlobal_RP4_v1.xlsx

Table 1 Results for the sensitivity analysis of ERs' global uncertainty.

6 TRANSFER OF TITLE TO ERS

6.1 Ability to transfer title

The 2016 ERPD established that the ER Program of Chile would develop a Benefit Sharing Plan (BSP), which is based on the basic principle that the distribution of benefits associated to result-based payment programs is conditional on a previous transfer of carbon rights. The BSP prioritizes the provision of benefits to small and medium landowners and Indigenous Peoples but does not exclude large landowners who are eligible for benefits achieved through REDD+ financing.

From a regulatory stand point, Chile does not have a specific legal framework to determine the transfer or the ownership of ERs. However, for the purposes of the FCPF ERPA, the ability of the Program Entity to transfer ER title is demonstrated based on holding on benefit sharing arrangements supported by different legal norms and other mechanisms that give effect to criterion 36 of the FCPF Methodological Framework.

In 2019, the CONAF's ability to transfer ER Titles was defined through the management of three possibilities:

- a) Possessing the legal capacity to do so, in which case the respective legal framework must be cited.
- b) Agreements and/or sub-agreements with potential holders of land and resource tenure rights.
- c) Benefit-sharing agreements under the Benefit Distribution Plan.

The ability of the Program Entity to transfer title to Emission Reductions (ERs) was addressed in detail within the document titled "Note on the Ability of Program Entity to Transfer Title to Emission Reductions (ERs) Forest Carbon Partnership Facility, Carbon Fund," which was provided to the Forest Carbon Partnership Facility (FCPF) in a timely manner in 2019. In June 2020, the National Forestry Corporation (CONAF) undertook an exploratory analysis of the legal nature of ERs. This analysis culminated in the creation of a Legal Opinion document, which reached several key conclusions.

The Legal Opinion established that Chile, operating within the voluntary framework of the international climate change regime, retains the authority to manage and dispose the ERs. The country has chosen to generate reduced emissions within a jurisdictional accounting area, a decision intended to facilitate greenhouse gas (GHG) accounting and prevent potential claims regarding these reductions.

Furthermore, the Legal Opinion clarified that ownership of land where GHG capture capacity enhancements occur is not a determining factor in the transfer of ER titles. In Chile, there is no ownership of the ER themselves; instead, the responsibility for fulfilling emission reduction obligations rests with the country. It was concluded that while individuals may possess ownership of specific parcels of land, they do not own the emission reductions achieved on their property or through the vegetation resources contained within it. These emission reductions are considered national assets, intended for public use.

For the ERPA Reporting Period 2024, the results come from the emissions reduction from deforestation and from native forest substitution activities. For the monitoring period, the emissions derived from deforestation are the lowest of the ERPA crediting period, with an annual rate of 1,820 ha/yr. The reduction in deforestation contributed to 4,115,654 tCO₂e.

Native-forest substitution, i.e., the conversion of native forest to exotic species forest plantations, is also the lowest value of the ERPA crediting period. The annual area affected decreased from 7,188 ha/yr in 2018-2019 to 370 ha/yr in 2020-2021, 240 ha/yr in 2022-2023, and 190 ha/yr in 2024 monitoring period. The reduction of native-forest substitution contributed to 4,146,304 tCO₂e.

Measures to reduce deforestation and the conversion of native forest to forest plantations are routinely incorporated into CONAF's standard forest management operations, as described in chapter 1.

The following paragraphs explain how Chile addressed each of the three alternative mechanisms set out in the FCPF Methodological Framework, which also applies to the 4th reporting period (2024). All three mechanisms were considered, both individually and in combination.

a) Possessing the legal capacity to do so, in which case the respective legal framework must be cited

Chile's ratification of the UNFCCC and the Paris Agreement established the legal basis for implementing its Nationally Determined Contribution (NDC). CONAF was subsequently designated as the national REDD+ focal point, providing it with the institutional mandate to lead the generation of ER under the FCPF framework and to pursue REDD+ results-based payments consistent with UNFCCC and Paris Agreement requirements. Notably, in 2019, Chile demonstrated its capacity to receive such payments by submitting results achieved in 2015 and 2016 to the Green Climate Fund's REDD+ results-based pilot payment program. The proposal was approved for USD 63 million.

These actions are consistent with the national legal framework, as outlined in Article 3 of CONAF's Statutes, which assigns CONAF the exclusive mandate of "contributing to the conservation, improvement, management, and utilization of the country's protected forest resources and wildlife areas." The statutes further permit the establishment of agreements and contracts with various entities to fulfill this mandate.

During the fourth ERPA reporting period, covering 2024, CONAF continued to perform its regular forest management and enforcement functions. These included implementing the Native Forest Law No. 20,283, overseeing forest management plans, preventing forest fires, and addressing illegal logging and unauthorized extraction. The "Siembra por Chile" program developed by the Government also remained active, supporting economic recovery and job creation through forestry initiatives. In addition, implementation of +Bosques—the ENCCRV's results-based program, whose pilot began in 2020—continued to the third cycle of the Benefit Sharing Plan.

b) Agreements and/or sub-agreements with potential holders of land and resource tenure rights

The BSP operates on the principle that distributing benefits tied to result-based payments depends on the prior transfer of carbon rights. To enable this transfer, landowners or resource-rights holders enter into "Additional Agreements" with CONAF. Article 3 of CONAF's statutes authorizes the institution to undertake activities and enter into public or private agreements and contracts with domestic or foreign individuals and entities—even its own partners—provided that these arrangements support its institutional objectives. This authority provides the legal basis for CONAF to enter into the agreements and contracts required to generate ERs and implement the BSP.

The signing of such Additional Agreements was a recommended option in legal opinion regarding the transfer of the titles, to ensure that there would be no claims by forest landowners. These agreements expressly authorize CONAF to transfer ER title and prohibit the landowners from selling or registering the same ERs in the voluntary carbon market. To prevent double claiming, signatories may not enter into similar agreements covering the same ERs with other public or private entities.

These Additional Agreements are designed for those large landowners who do not apply to the ENCCRV BSP, since they would be the only ones with the capacity to generate a carbon project that can go through the MRV in a Voluntary Carbon Market. That is why this option of Agreements with potential forest landowners is presented, in case there is interest.

During the 4th reporting period, no Additional Agreements were signed with potential landowners in the ERP accounting area because no landowner demonstrated the capacity to generate ERs independently of the Program. The only agreements executed during this period were those established under the BSP. Accordingly, there risk of competing claims by third party owners of forest land are considered low. A review of international carbon market registries found no evidence of significant interest in developing carbon-credit projects within the accounting area.

To date, there are no projects within the accounting area that have generated tradable emissions that should be discounted from the ERPA with the FCPF Carbon Fund for this period (see 6.4). Based on this, the risk of claims within the program area remains very low. The BSP works as a mechanism to mitigate any potential conflict by compensating and recognizing actors in the territory, eliminating or diminishing the incentive to claim ownership of ERs.

c) Benefit-sharing agreements under the Benefit Distribution Plan

The third FCPF mechanism for justifying ER transfers is referring to the BSP. This option is more relevant to the context of Chile than the previous mechanisms, as it recognized that public policy outcomes are not necessarily prone to private appropriation.

CONAF has developed a BSP for the ENCCRV and ER Program under transparency, participation, and fairness standards according to criteria 29, 30, 31, 32 and 33 of the FCPF Methodological Framework. To this report period, Chile has operationalized the BSP with the 4th version of the BSP document, while in June 2025 the 5th version⁶⁸ was implemented in a new public tender cycle.

This BSP is consistent with the regulatory framework described above and promotes the adequate distribution of benefits. It also reflects key principles of environmental law and UNFCCC agreements, particularly in terms of poverty eradication and respect for the human rights of vulnerable groups, as recognized in Article 3 and the preamble of the Paris Agreement.

To achieve this outcome and minimize potential conflicts, CONAF developed and updated its BSP through participatory processes that incorporated gender-responsive and intercultural approaches, in accordance with the vision and priorities of local communities. This process was designed to ensure the fair, equitable and transparent distribution of non-monetary benefits primarily targeting small and medium forest owners.

The ERP Participant Landowners Agreements—entered into between land title holders and CONAF— include two key provisions: they explicitly prohibit signatories from entering into similar agreements between any other public or private entities, and they explicitly authorize CONAF to transfer ERs generated on those lands as a result of projects implemented there.

In conclusion, the BSP meets the requirements of the Carbon Fund Methodological Framework and serves as a basis to validate that CONAF can transfer ERs according to the requirements. Collaboration agreements under the BSP, are the instrument that, in practice, ensures the transfer of title to the ERs to CONAF (now to SERNAFOR) by obtaining the express authorization of the landowners.

For the fourth Reporting Period, three operational cycles of the BSP have been executed, in 2022, 2023 and 2024, in which benefits have been awarded to the program beneficiaries who implemented direct activities such as sustainable forest management and forest management, preventive forestry, forest restoration and afforestation. For the 2022 BSP cycle, 214 Collaboration Agreements between beneficiaries and CONAF were signed on the public Tender modality. Additionally, 93 agreements on pilots and prioritized projects were signed in 2025⁶⁹. For the 2023 operational cycle, the collaboration agreements with beneficiaries began to be signed in 2024, since the award of the Public Tender was at the beginning of that year.

For the reporting period, a total of 440 agreements were signed: 420 under the public tender and 20 related to prioritized initiatives. Regarding the public tender initiatives, a total of 359 initiatives was individualized, with 86 project holders belonging to Indigenous peoples and 180 holders being women. It is necessary to consider that a

⁶⁸ Benefit Sharing Plan 5th version: <https://www.enccrv.cl/5ta-edicion-sdb>

⁶⁹ Collaboration agreements: https://drive.google.com/drive/folders/1sLlyY-6cxdavLTJhdkhcxwCZ1Hiy3OHdP?usp=drive_link

project may have more than one collaboration agreement in relation to the number of lands properties included in the initiative.

Therefore, considering the three mechanisms described above or combination of them, the legal analysis determined that according to the FCPF Methodological Framework, the document “Note on the Ability of Program Entity to Transfer Title to Emission Reductions (ERs) Forest Carbon Partnership Facility, Carbon Fund” and the existing legal framework, CONAF is able to transfer ERs, as stated in Official Letter No. 74/2019, March 1st, 2019, submitted to the FCPF by CONAF. In addition, for this Reporting Period, the Program Entity has not been aware of any title contest in which interested parties in the ER Program area have challenged the capacity of the Program Entity.

6.2 Implementation and operation of Program and Projects Data Management System

The design of the data management system for the ER Program and its respective sub-projects was presented in the 2016 ERPD document, according to the FCPF Methodological Framework requirements. This is a fundamental part of the Monitoring Plan and suggests as objectives: provide transparent data and information, which are consistent over time and suitable for measuring, reporting.

The document “Additional Information for the ER Program Update, per recommendations issued in the Chair’s Summary in the 15th Meeting of the Carbon Fund” (2018) updated the Monitoring Plan and described the progress made in its implementation, including the time planning for monitoring milestones, the systems and methodologies to be applied, and the institutional arrangements involved. As part of these updates, the objectives of the NFMS Monitoring and Measurement System (SMM, acronym in Spanish) were also revised and defined as follows:

- Optimize generation processes and ensure the implementation of monitoring events for primary elements (Land use and Land use change maps) for the estimation of emissions and absorptions linked to REDD+.
- Generate interoperability protocols for the integration of information at various spatial scales, time scales, differentiated file formats and purposes, including information of Co-benefits and Safeguard Follow-up.
- Automate report generation processes and increase report transparency.
- Have a visualization and consultation platform, to facilitate the dissemination of results, that responds both to the verification criteria in international instances as well as to institutional necessities and citizen demands for information.

For Data Management System, ENCCRV developed a web-based platform including semi-automated information integration tools. Also contains a geospatial content with a web mapper viewer and a forest carbon calculator for the executed land/property projects in the ENCCRV programs. From here, two key tools are developed to monitor ENCCRV projects, the land project monitoring system and the safeguards information system (SIS).

These web applications are built on open-source languages to ensure their long-term durability and interoperability. They are designed to integrate seamlessly with other CONAF systems associated with the ENCCRV at the institutional level, namely the Land Prioritization System ⁷⁰(Sistema de Priorización de Territorios, in Spanish) and the Co-Benefits System (Sistema de Co-Beneficios, in Spanish). These systems are consolidated into a single web-based tool.

The ENCCRV Platform is a centralized system for managing REDD+ projects executed under the ENCCRV framework, fed by CONAF’s territorial implementation teams. At present, the platform supports REDD+ projects executed by CONAF; it does not accommodate private projects, as none exist yet.

⁷⁰ The Land prioritization system applies a multicriteria evaluation to define prioritized areas for the action measure activities execution in the accountability ERP area. All the SDB execution activities shall be into a specific prioritization area, depending on MDA.

The platform enables adequate storage and visualization of generated information and has strengthened data reconstruction and integration capabilities. It also supports the elaboration of reports and indicators, as well as calculations at different scales for a variety of purposes. This is in accordance with and responds to compliance with international requirements and responses, and to specific requests from institutional or public consultation.

Currently, around one thousand REDD+ initiatives are hosted on the ENCCRV Platform⁷¹. Most of them are projects within the BSP framework, so compliance with the requirements established by CONAF to access benefits is guaranteed. The total area of interventions recorded in the system is 27,944 hectares, distributed across the following activity types: forest restoration and management (over 14,000 ha), afforestation (3,830 ha), wood energy (3,321), preventive forestry (5,441 ha), and post-fire forest restoration (660 ha). At present, the platform stores REDD+ initiatives executed under the ENCCRV; it is expected other actions carried out by that CONAF will be incorporated in the future.

Region	REDD+ Initiatives
IV Coquimbo	38
VII Maule	188
XVI Ñuble	120
VIII Biobío	313
IX La Araucanía	381
XIV Los Ríos	116
X Los Lagos	345
Total	1,501

Table 2. Number of REDD+ projects in plataforma.enccrv.cl

While the data management system remains limited to CONAF-executed projects, a separate procedure is in place to register REDD projects carried out by another entities. This procedure involves a review of international registration systems for reduced emissions transactions or carbon credits, with the aim of tracking this information and ensuring it can be excluded from benefit payments, where applicable. This information is made publicly available through the ENCCRV site, in the Redd+ Information Tracking System, accessible under Section 2.4 at <https://www.enccrv.cl/medicion-y-monitoreo> . Further details are presented in Section 6.4.

6.3 Implementation and operation of ER Transaction Registry

As outlined in Section 6.2, one of the objectives of the ENCCRV SMM was to develop a Reduced Emission Transaction Registry System. This tool responds to the FCPF Methodological Framework requirements for countries seeking to enter into a result-based payment agreement with the Carbon Fund. It also addresses Articles 5 and 6 of the Paris Agreement, which establishes the basis for REDD+ implementation through market-based approaches and other cooperative mechanisms—enabling countries to exchange emissions reductions achieved through REDD+ activities, meet the targets set in their NDCs, and avoid double counting.

In the ERPD CONAF considered developing a ENCCRV Reduced Emission Transaction Registration System, which should be a national and centralized system which guaranteed that the reduced emissions generated under the ENCCRV framework could be adequately emitted, serialized, transferred, removed, or canceled. In addition, it should also offer clear connections to different sources of information contained in the platforms used within the SMM framework. Its main function would be to avoid the duplicate transaction of reduced emissions, and act as the main tool for the control of REDD+ emission reduction transaction reporting and accounting in Chile.

⁷¹ The information from the ENCCRV Platform is updated everyday at the server geonode, connected to the spreadsheet:

https://plataforma.enccrv.cl/static/erpa/mr4/reporte/Reporte_Plataforma_ENCCRV_Rodales_Sup.xlsx

The design of this registration system finished in 2020 with an IHS Markit system adapted to the REDD+ activities quantified by CONAF. Currently, it is not being operated because Chile is using World Bank Carbon Assets Tracking System (CATS).

CATS is a central platform to support operations under the FCPF CF and BioCF ISFL which is free and has flexible operating rules to be easily adapted to other World Bank platforms and future scenarios. Given this, Chile issued a formal letter to define the CATS platform as the official reduced emission transaction registration system of the ER Program and ENCCRV.

For this reporting period, the use of CATS⁷² registers the cumulative ER transactions, including those corresponding to the 3rd Reporting Period. At the time of report submission, the following amount was recorded in CATS under “Total Active Units (Net of Buffered, Retired, Cancelled, Deducted)”: 4,036,930 tCO₂eq. By the end of this year, the transactions corresponding to ERMR4 are expected to be registered, in accordance with the flexibility established under the ERPA.

To avoid double counting, Chile executes a verification procedure for International ER Registrations to identify REDD+ projects that are executed in the country. International registrations are reviewed every two months, and the information that is collected gives rise to a data sheet where the information of the projects is entered, including the owner, the volume of transfer of ER, the year of generation, along with other backgrounds. This information is publicly available on the ENCCRV website, SMM section <https://www.enccrv.cl/medicion-y-monitoreo>.

In addition to the above, it must be taken into consideration that recently, in 2023, the compensation regulation (reglamento de proyectos de reducción de emisiones de contaminantes para compensar emisiones gravadas conforme a lo dispuesto en el artículo 8º de la LEY Nº 20.780⁷³) was approved and published in Chile, which regulates the operation of the Emissions Compensation System, which will allow offsetting emissions affected by the carbon tax. This system considers the development and implementation of all the necessary infrastructure to offset local pollutants and other GHGs, including nature-based solutions projects, so greater interest is expected in the development of projects from private developers. Until the presentation of this monitoring report, no forest sector project was generated under the compensation mechanism.

6.4 ERs transferred to other entities or other schemes

The ENCCRV ER Program is part of Chile's efforts under REDD+, with emission reductions estimated using the Forest Reference Emission Level (FREL). This program represents Chile's first subnational initiative for result-based payments related to REDD+. The emission reductions secured through the Emission Reduction Payment Agreement (ERPA) are guaranteed based on FREL estimates.

To support these efforts, Chile has developed a financing package for result-based payments, primarily linked to the Green Climate Fund (GCF)—a global financial mechanism that supports climate projects. Although the Green Climate Fund does not involve direct transfers of ERs, it does not impact on the ER Program's compliance. To ensure adequate implementation, Chile has strengthened its registration and monitoring systems through digital tracking tools and periodic audits. These measures accurately record ER and prevent overlapping claims, thereby avoiding double counting and legal or other disputes in the areas where the program operates. Together, they help ensure that this and future initiatives are implemented.

⁷² Link to CATS: <https://cats.worldbank.org/ProgramDetails?programId=336§orId=70>

⁷³ Available in <https://www.bcn.cl/leychile/navegar/imprimir?idNorma=1196414&idVersion=2023-09-29>

Currently, there are seven LULUCF projects linked to the voluntary market implemented by VCS in Chile⁷⁴. According to its own records, no credits due to emission reductions have been claimed during the 2024 reporting period which significantly reduces potential inconveniences. These are:

- [Valdivian Coastal Reserve Project](#), Los Ríos region. Project led by The Nature Conservancy (TNC), corresponding to a project in the planned degradation and deforestation REDD subcategory, generating around 58,154 estimated annual emissions reductions. The registry of this project has no activities from 2016 and expired in November 2023.
- [California Valley degraded land reforestation project](#), Los Lagos region. The initiative is led by the Agrícola y Forestal SNP Limitada Company, being an ARR project estimated to generate 1,193 estimated annual emissions reductions. The registry of this project has not had activities since 2017. The registry status is Late to verify.
- [Caelus project](#): under validation process, with 111 estimated annual emission reductions. The project is based on GHG emission reductions and removals generated by improving forest management practices to increase the carbon stock on land by extending the rotation age of a forest before harvesting. The emissions reductions of this project come from exotic species forest and are excluded from the REDD+ accountability.
- [Bosques Cautín S.A.](#) project: under validation process, with 124,951 estimated annual emissions reductions. The project is a forest developer operating in Chile, that has traditionally operated a silvicultural model for commercial timber and is expanding its business model to dedicate different areas of forest plantations to carbon sinks. The emissions reductions of this project come from exotic species forest, and are excluded from the REDD+ accountability.
- [Bosques Cautin S.A Forest Carbon Project II](#): Withdrawn process, with 78,951 estimated annual emission reduction registered in December 2023. The project involves the conversion of logged forests into protected forests to enhance carbon sinks, integrating social, environmental, and climate change considerations. It primarily relies on exotic species, including *Eucalyptus globulus*, *Eucalyptus nitens*, and *Radiata pine*, for carbon sequestration. While 3,867 acres of native forest are conserved as buffer zones, the emissions reductions of this project come exclusively from exotic species plantations and are therefore excluded from REDD+ accountability.
- [Proventus project](#): under validation process, with 2,301 estimated annual emissions reductions. The project is based on changing the use of low productivity land to sustainable forest production systems, which will increase the forest cover and promote remnant natural forest improvement generating a landscape of biological corridors that bring about financial, social and environmental services. The emissions reductions of this project come from exotic species forest and are excluded from the REDD+ accountability.
- [Reforestation in degraded land, in Biobío region](#): this project is in status “Late to Verify”. With 16,864 estimated annual emissions reductions, it is a reforestation project with local landowners and considers advanced propagation technology, mycorrhizal inoculation, to help restore and convert degraded grassland into productive forests in several regions of Chile. The registry of this project has no activities from 2018 and considers exotic species plantation; there, it is excluded from monitoring emissions reductions.

CONAF has not established procedures or agreements for selling or assigning Emission Reductions (ERs) from the ER Program area to other entities under different greenhouse gas programs or standards. However, these projects could potentially trade ERs during the 2024 monitoring period. To prevent double counting, CONAF plans to exclude ERs that are reported as participants in voluntary carbon market standards, ensuring that ERs from areas already committed to other buyers are not counted again.

⁷⁴ See section 2.4 in: <https://www.encrv.cl/medicion-y-monitoreo>

7 REVERSALS

Regarding the strategy that the ER Program has proposed to prevent and minimize the potential for reversals, the ERPD document proposed several measures. Given that the ERP is in an early stage of implementation, many of these actions do not present concrete progress (no activities funded by the ERPA through the SDB have been implemented), but other measures associated with the permanent activity of CONAF do have progress for the period of this report, which are summarized below.

In relation to the risk associated with the lack of broad and sustained support from key stakeholders, progress has been made in analyzing the risk of land conflicts before designing and executing ENCCRV projects in the territories, establishing protocols and procedures for this within the updated version of framework of environmental and social management (MGAS). In addition, the ENCCRV has continued to be developed with expanded participatory processes, ensuring that their opinions and needs are included in the design of different key components of the ER Program, such as the [BSP](#).

Regarding the risk associated with the lack of institutional capacity and/or ineffective vertical/cross-sector coordination, an important inter and intra-institutional coordination has been maintained, carrying out multiple induction, training and dissemination activities on political and technical issues of the REDD + approach and on the ENCCRV.

Regarding the risk associated with the lack of long-term effectiveness in confronting underlying factors, progress has been made in improvements to the current forest policy and regulations, including improvements to the Native Forest Law, and the design of a new forest law that promote the recovery of areas burned by forest fires and promote reforestation with new generation plantations that take into account the country's climate scenarios and goals. Progress has also been made in governance, strengthening the issue of Climate Change at the institutional level through specific programs (wood energy, forestry extension, community forestry, others) and the strengthening of capacities in CONAF's technical structures.

Finally, the advances associated with reducing the risk of natural disturbances and disasters have focused on strengthening the efforts to prevent and combat forest fires in CONAF, including different institutional programs for education and preparation of communities for these events, as well as of improvements in infrastructures, equipment, capacities and technologies for the prediction and combat fire. Important progress has also been made in the monitoring and evaluation of fires, relevant inputs for restorative processes in affected areas.

Regarding the reversal management mechanism, Chile proposed using the Carbon Fund Buffer to store the credits associated with the risk of uncertainty and reversals. Specifically for reversals, it was proposed to use the reversal risk assessment tool that requires a specific amount to put in the buffer for each risk factor. These factors and an update of them are presented in more detail in section 7.3.

7.1 Occurrence of major events or changes in ER Program circumstances that might have led to the Reversals during the Reporting Period compared to the previous Reporting Period(s)

During the 2018-2019 monitoring period, it was identified that an anomalous event occurred in the PRE accounting area had an impact on the performance results reported for that period. This event corresponded to the Megadrought. Through an investigation conducted in 2022, an effect on the Mediterranean and temperate forests of Chile was confirmed, evidenced a browning trend in these forest ecosystems and a resulting reduction in their photosynthetic capacity.

The megadrought and the warming trends of summer temperatures are current climatological features that are not directly antropogenic in origin; however, further analysis is required to determine whether these phenomena are influencing at least 25% of the Program accounting area.

In this regard, the country developed a study on the Browning effect in the Mediterranean and temperate forests of Chile to determine and quantify the proportion of affected forest area and the ratio of degradation-related emissions associated with the megadrought. This anomalous event was reported to the Trustee in 2023, through several technical discussion meetings.

For the current monitoring period, this analysis has been updated in order to reassess its extent and potential implications for the Program accounting area and the reported performance results.

- **Forest Fires**

Fires in Chile are caused by anthropic actions and represents one of the main drivers of degradation and was identified as a main driver of forest degradation in the ERPD. Fire seasons in Chile are frequent events that occur during the summer season, where high temperature, low humidity and drought conditions can turn these frequent events into exceptional, barely controllable events.

For this reporting period, an increase in the forest fire surface was monitored and reported, even higher than the reference level, with 34,011 hectares of burned forests. The most affected region was La Araucanía, covering 54% of the total area burned during the period.

Reversal risks identified in the 2016 ERPD have not experienced significant changes. Nevertheless, due to the magnitude and dynamics of the event known as [Mega Forest Fire](#) which impacted Chile in the summer of 2017, the potential of forests to acting as sinks is estimated to have been affected. Around 500,000 hectares were burnt during this event, of which an important surface corresponded to pastures, scrubs, and forest plantations, excluded by both the ER Program and the [FREL/FRL](#). The impact on the AC Native Forest was 38,000 hectares, being the Maule region the most affected with 28,000 ha, then 10,000 ha in the Biobío region and finally 570 ha in the Araucanía region. Of the 81 million tons of gross CO₂ equivalent emissions estimated for the entire event, 7.45 million tons CO₂ were associated with the native forest of the CA. This information, along with other details associated to the analysis of the aforementioned event, can be found in the document “Additional information for the update of the Emission Reduction Program of Chile, as per recommendations by the Chair’s Summary in the 15th Meeting of the Carbon Fund” from 2018 ([here](#)).

- **Drought**

The degradation during the period is linked with the impact of drought and climate change on the state of vegetation, which has been scientifically proven by analyzing the impact of the decrease in rainfall on the browning of tree canopies, associated with a loss of vigor, especially in sclerophyllous forests. Furthermore, this phenomenon increases the availability of combustible material and creates environmental conditions that favor the generation and spread of forest fires, one of the main identified causes of forest degradation.

Chile has experienced over a decade of drought nationwide. Since 2010, the central regions of Chile have suffered extremely dry conditions, particularly in 2019 and 2021, when annual precipitation deficits exceeded 75%⁷⁵. Although the native forest has adapted to short drought periods, the duration of the current scenario is causing a significant increase in the native forest deterioration. ([CR2, 2020](#); [Miranda et al., 2020](#); [Garreaud et al., 2017](#)), along with an [increase in the forest fire regime](#).⁷⁶In particular, some species and forest types in the CA have displayed a higher sensitivity to precipitations and climate variables, being more affected ([Venegas-González et al., 2018](#); [Urrutia, R. & Rojas, Y., 2020](#)).

This scenario could impact the implementation and results of the Chilean ER Program, especially in the northern ERP regions. While there are scientific studies that have addressed some specific aspects of the drought, CONAF has conducted a study on its impact on the ER Program, which aimed to:

- i) Determine the CA native forest surface affected.

⁷⁵ <https://hess.copernicus.org/articles/29/5347/2025/hess-29-5347-2025.pdf>

⁷⁶ Venegas-González et al., 2018: https://scielo.conicyt.cl/scielo.php?script=sci_arttext&pid=S0717-92002018000100081&lng=en&nrm=iso ; Urrutia, R. & Rojas, Y., 2020 <https://bibliotecadigital.infor.cl/server/api/core/bitstreams/15fe26bb-25f6-4afe-9839-147125f9bf5b/content>

- ii) Assess the magnitude of these impacts on the native forest.
- iii) Estimate their effects over time.
- iv) Establish a correlation between these trends with emissions and captures from the native forest, both for the ER Program and the National REDD+ Strategy.

Recent studies (Miranda et al, 2020)⁷⁷ have addressed the impact of the 2010 – 2017 mega drought on the forests of central Chile, indicating its significant impact of the productivity of Mediterranean forests. In addition, a preliminary study conducted by the Forest Institute regarding degradation outcomes analyzed the 2000 – 2020 time series, seeking to identify drought events and their relationship with forests under browning conditions. As a result, the effect on browning in sclerophyll forests is made evident, which coincides with drought events in the evaluated period. The next graph displays the annual browning surface calculated based on Landsat ETM+ and OLI satellite material, for the Maule region and the north area of the Biobío (Just before the Ñuble – Biobío division) considering NDVI ranges of <0.45 and >0.2. The following figure is a synoptic depiction of the NDVI behavior for a stand in a sclerophyll forest, as an example.

⁷⁷ Forest browning trends in response to drought in a highly threatened Mediterranean landscape of South America, Ecological Indicators (journal homepage: www.elsevier.com/locate/ecolind). Link: <https://www.sciencedirect.com/science/article/abs/pii/S1470160X20303381>

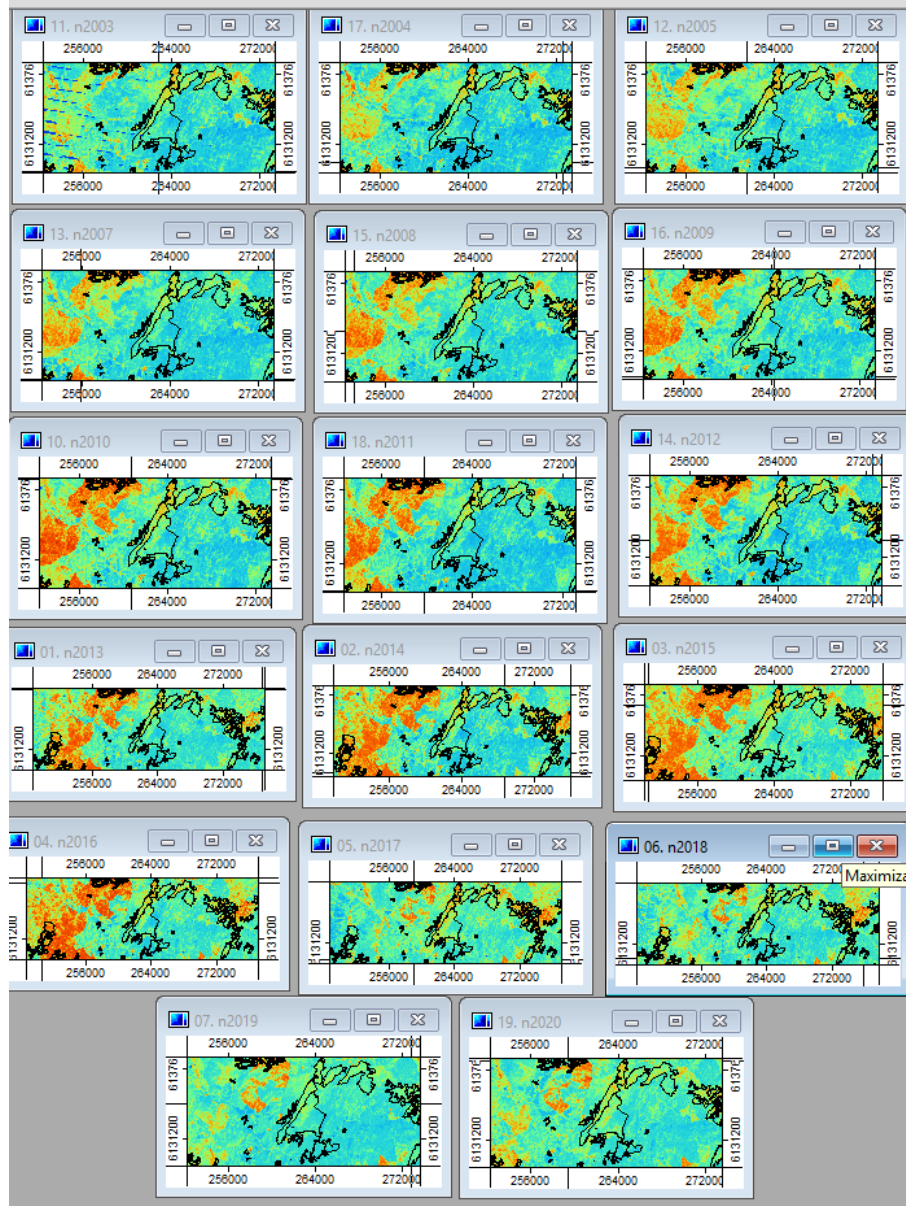


Figure 9 Synoptic view of NDVI behavior in sclerophyll forests (example).

This information was used to count the sclerophyll forest surface with signs of browning, based on the native forest registry for these regions. The occurrence of drought events in the period was added, corresponding to 2007, 2010 – 11, 2016 and 2019 – 20. As a result, the following graph summarizes the annual browning surface, highlighting the years with drought events in pink.

It is possible to conclude that, while browning is evident in the results, it would not be a new event specific for the period associated to the mega drought but would rather be associated to a cycle of recurring drought weather events in the last two decades, which is related to climate change. Then, the peaks showing the largest browning effect in the graph coincide with historical drought events reported in Chile and are possibly related to El Niño/La Niña phenomena. It is also worth noting that the frequency of these events has increased from 6 to 7 years at 2 to 3 year rates, although their magnitude is greater regarding the base year (2000), possibly indicating a resilience effect of this forest type.

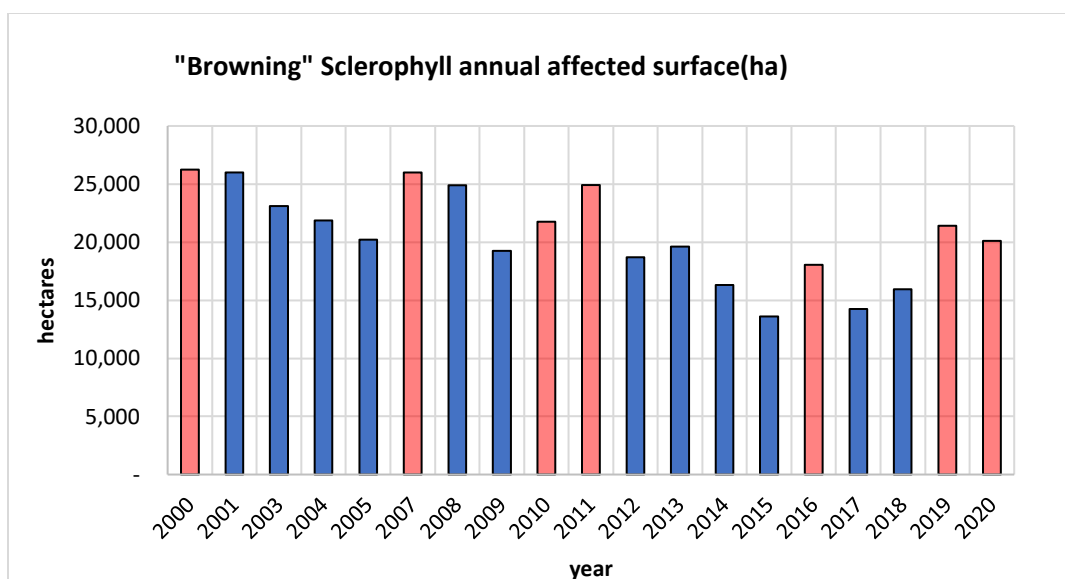


Figure 10 Annual yellowing evolution in Sclerophyll forests of the Maule region.

As demonstrated on a preliminary basis, there is evidence of a browning effect on sclerophyll forests, exacerbated by the mega drought. Nevertheless, more information is required for this to be determined. This requires more in-depth studies in order to determine the magnitude of these effects on the various forest types or species, at different latitudes where the impacts of the effects of mega drought are also different.

To be able to specify the impact, it is required to expand the time being evaluated including a period before the year 2000 which would allow to analyze spectral responses of forests in scenarios with no drought events, therefore knowing how plant formations respond to a lower water availability.

Literature also indicates that, along with the decline in rainfall and temperature increase, slope exposure could be an important factor in the loss of vegetation vigor, so it would be another variable worth evaluating. Definitely, once impacts have been detected on a preliminary basis, it is necessary to spatialize their occurrence in native forests, determining their effect in terms of captures and emissions.

In 2022 the GAC consulting ⁷⁸develops a methodology to determine the effect of the megadrought in the forest remaining forest. The Chilean experts (GAC-UC) identified areas, by forest type, where vegetation anomalies in the primary productivity variable were frequent between 2001 and 2021. These areas under the impact of the megadrought are the areas affected by browning and correspond to those areas of forest that remain as forests that present phenological anomalies. So, in this study, browning was understood as an abrupt drop in the productivity of trees whose consequences translate into decreased growth or in mortality The study area was the accountability forestland remaining forestland (FRF) area of the ERP.

7.2 Quantification of Reversals during the Reporting Period

Left in blank. There are no reversals events that occurred in the reporting period

⁷⁸ The final report can be found in the following link: <https://plataforma.encrv.cl/static/erpa/mr3/monitoreo-browning/Informe-Final.Identificación de áreas de bosque nativo afectadas por pardeamiento RevB.pdf>

7.3 Quantification of Pooled Reversal Buffer replenishments

Left in blank. There are no reversals events that occurred in previous reporting periods.

7.4 Reversal Risk assessment

Risk Factor	Risk Indicators	Default Reversal Risk Set-Aside Percentage	Discount	Resulting Reversal Risk set-aside percentage
Default risk	N/A	10%	N/A	10%
Lack of broad and sustained stakeholder support	<i>This risk was defined as Medium in the ERPD, considering that there are land tenure conflicts in Chile, uncertainty in the appropriation of benefit rights, and risks of an inappropriate inclusion of the different actors in the ER Program. In the period of this report, there has been progress in the country in improving some of these aspects, however, there are still relevant gaps that keep the risk level at medium.</i> <i>The main indicators of progress are:</i> • <i>There is a process of participation and inclusion in the formulation and implementation of the ERP, considering small landowners, medium landowners and indigenous communities.</i> • <i>Permanent operation of platforms to channel citizen demands, such as the MRS⁷⁹.</i> • <i>There are communication and validation channels with opportunities for formal participation in CONAF and MINAGRI, e.g. CONAF's COSOC, CTICC.</i> • <i>Adequate functioning and representativeness of the Regional REDD+ Groups⁸⁰.</i> • <i>Efficient and transparent operation of the BSP.</i> • <i>Operation of the Safeguards Information System, and other monitoring activities.</i> <i>Dissemination of the ERP integrated into the institutional management of CONAF at the national and regional level (forestry dissemination and extension programs).</i>	10%	Medium risk, 5% deducted	5%
Lack of institutional capacities and/or ineffective vertical/cross	<i>This risk was defined as Low in the ERPD, considering the knowledge and skills gaps existing in the institutions involved and the lack of coordination between them. In the period covered by this report, Chile has taken measures to ensure enhanced articulation and strengthening of government institutions involved in the issue of climate change with</i>	10%	Low risk, 10% deducted	0%

⁷⁹ Inquiries from citizens are received through its website: <https://oirs.conaf.cl/>. The access to this link is geographically restricted and is only available from IP addresses located in Chile.

⁸⁰ The REDD+ Groups are regional BSP governance teams constituted by people representing civil society, indigenous peoples, NGO's, Academy, private sector, CONADI (National Indigenous Development Corporation) and local authorities such as municipalities. They are united at least once a year to follow up BSP regional criteria, promote local governance and decentralization of decision-making within the framework of the ENCCRV.

sectorial coordination	<i>the ER Program and the ENCCRV, with formal entities such as the Intraministerial Technical Committee of Climate Change (CTICC, acronym in Spanish). These advances keep the risk level low.</i> <i>The main indicators of progress are:</i> <i>Strengthening of the institutional capacities of CONAF (DCCSE, other departments and regional offices) for the management of the ERP.</i> <i>Improvements in institutional conditions, management and logistical aspects that allow the proper functioning of the Regional REDD+ Groups.</i> <i>Signing of the agreements required between forestry and agricultural institutions for the correct implementation of the program in the territory. In 2023, a Letter of Agreement with the Agricultural Research Institute (INIA) of the Ministry of Agriculture was signed to design and implement the "Program for the technological transfer of silvicultural waste management alternatives". Another Letter of Agreement was signed with INFOR for the development of a "Technical advice to strengthen capacities for the supply of seeds and production of native plants within the framework of the +Bosques project".</i> <i>Ensure integration and coordination between the various CONAF extension programs and MINAGRI promotion instruments in the ERP regions.</i> <i>Maintain and expand the participation –when necessary – of other institutional coordination mechanisms linked to climate change and land management at the regional level (e.g. the Inter-ministerial Technical Committee on Climate Change, CTICC), the Regional Technical Committee on Climate Change and (CTRCC) and Regional Committee on Climate Change (CORECC).</i> <i>Integration of ENCCRV into the environmental and climate policies of Chile for REDD+ compliance, such as the Climate Change Adaptation Plan in the Agroforestry Sector, National Climate Change Action Plan 2017-2022, and the update of Chile's NDC.</i> <i>Secure the additional financing required for the institutional operation of the ERP.</i> <i>Also, In September 2023, Law 21,600 was published, creating the Biodiversity and Protected Areas Service (SBAP), which is in an implementation period, becoming operational on February 1, 2026. This public service, under the Ministry of the Environment, will be responsible for biodiversity conservation and its main instrument will be the administration of a national system of protected areas.</i>			
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Lack of long term effectiveness in addressing underlying drivers	<i>This risk was defined as Medium in the ERPD, considering the deficiencies and limited scope of forest laws and their promotion instruments, which did not adequately address the causes and agents of deforestation and degradation. Risks of ineffectiveness in governance and the lack of continued funding to implement the ENCCRV action measures were also considered. In the period of this report, there has been progress in the country in improving these aspects, however, there are still relevant gaps that keep the risk level at medium.</i> <i>The main indicators of progress are:</i> <i>Integration of ENCCRV into the environmental and climate policies of Chile for REDD+ compliance. Climate Change Adaptation Plan in the Agroforestry Sector, National Climate Change Action Plan 2017-2022, NDC of Chile (2020 % 2025 NDC update).</i> <i>Financing for the institutional management of the ENCCRV and the ERP at the national and regional level, and leverage of additional funds for its execution in the territory (UN-REDD, GCF).</i> <i>Search for new long-term financing models. Within the framework of the Technical Consultancy financed by UN-REDD, during the second semester of the year 2024, the consultancy "Financial Planning Proposal for the Updating of the National Strategy for Climate Change and Vegetation Resources of Chile" was carried out, where different sources of financing and the requirements for which the country could apply were identified.</i> <i>Alignment of the action measures of the ENCCRV and the ERP with the actions defined under the national forest legislation (Law 20,283 and Decree 259) and forest extension regulation that ensures their execution over time.</i> <i>In 2022, a new instruction was issued by the Ministry of Agriculture to prevent the abuse of land subdivision regulations that could threaten agricultural production systems, the ecosystem and the socio-environmental balance of the localities in which they are located (Instruction N°637/2022). During 2024, Resolution N° 4.788 determines how to issue subdivision certificates for subdividing rural land⁸¹.</i> <i>In March 2020, the Comptroller General of the Republic ordered the cancellation of the "Native Forest Cutting Management Plans for the Recovery of Land for Agricultural Purposes" that did not require the obligation to reforest, because such a permit does not comply with the purpose of protecting, recovering and improving the native forest to ensure forest</i>	5%	<i>Medium risk, 2% deducted</i>	3%
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⁸¹ <https://bosquenativo.cl/wp-content/uploads/2020/04/2020-03-16-dictamen-contraloria-1.pdf>

	sustainability and environmental policy, as stated in the Native Forest Law. In 2025 was generally approved the National Forest Service Law project creation, for forest promotion, forest fire prevention and starts as a so relevant role for the forestry sector in Chile.			
Exposure and vulnerability to natural disturbances	This risk was defined as Medium in the ERPD, considering that Chile presents one of the highest levels of exposure to natural disturbances worldwide due to its geographic location along the Pacific Ring of Fire, its complex topography, and its pronounced latitudinal and climatic gradients. In this context, the main hazards in the Accounting Area (AA) include earthquakes, tsunamis, volcanic eruptions, landslides, floods, droughts, and wildfires. However, most of these disasters do not cause extensive damage to the forests (with exception of wildfires and drought), and their temporary recurrence is low. In general terms, exposure is strongly conditioned by settlement patterns and land-use dynamics. A significant proportion of the population and critical infrastructure is concentrated in coastal zones, river valleys, and mountain foothills, which are areas naturally prone to seismic activity, flooding, and mass movements. Urban expansion into risk-prone zones, often driven by housing deficits and economic pressures, has increased the number of people and assets exposed to hazards such as floods, landslides, and wildfires. Vulnerability is shaped by both social and environmental factors. Socioeconomic inequality, informal housing, and limited access to resilient infrastructure increase sensitivity to disasters, particularly in peri-urban and rural areas. Climate change has intensified existing vulnerabilities by increasing the frequency and severity of droughts, heatwaves, and wildfires, especially in central and southern Chile (AA). Ecosystem degradation (deforestation, soil erosion, and loss of native vegetation) further reduces natural buffers against hazards such as floods and landslides. Specifically, forest fires generate a very high impact, in terms of degradation and emissions, but in Chile these events are classified as 100% anthropogenic in origin, therefore, they are not considered natural disturbances. On the other hand, as evidenced in 7.1, droughts increased their recurrence in the AA, so it is considered that this factor should increase its risk to a high level, in the period of this report. The main indicators of progress for this factor are:	5%	High risk, 0% deducted	5%

	• <i>As a result of the effects of climate change (rising temperatures, rising sea levels, retreating glaciers, and intensification of extreme weather events, such as droughts and floods), wildfires could increase in the future, increasing the negative effects of the mega-drought in the northern regions of AA. For this reason, CONAF is working on monitoring the impact of the mega-drought on the temperate forests of Chile, as well as working on different fire prevention and fighting programs⁸², as well as in activities to restore forest ecosystems affected by fires (for example, through the ENCCRV's IF2 MDAs).</i> • <i>Currently, Chile is in the legislative process of the Forest Fire Law, which seeks to regulate the prevention and mitigation of forest and rural fires: classifying the country into risk zones according to territorial particularities; generating territories better prepared for fires; establishing a mandatory framework for vegetation management and the creation of firebreaks in urban-rural interface zones; and increasing oversight and toughening sanctions for negligence.</i> • <i>Due to the need to strengthen integrated risk governance, in 2021, through Law 21.364⁸³ (which became fully operational in 2023), the National Disaster Prevention and Response Service (SENAPRED) was created. This institution is responsible for advising, coordinating, organizing, planning, and supervising activities related to disaster risk management in Chile.</i>			
		Total Reversal Risk set-aside percentage	23%	
		Total Reversal Risk set-aside percentage from ER-PD or previous monitoring report (whichever is more recent)	23%	

⁸² <https://www.conaf.cl/incendios/>

⁸³ <https://www.bcn.cl/leychile/navegar?idNorma=1163423>

For the crediting period 2024, the reversals risk assessment was updated with respect what was reported ERPD, in the risk factor Exposure and vulnerability to natural disturbances. In the ERPD this risk factor was assessed as Medium, assigning a percentage of 3%. In the 2022-2023 monitoring period the value was increased to the maximum, considering the High Risk of natural disturbances and disasters. As was observed and explained, 2018-2019 and 2020-2021 reporting periods were heavily affected by drought and climate change. The total reversal risk percentage is then 23%.

However, during September and October 2023, through discussions held with the Carbon Fund participants where Chile presented an adjustment to the emissions accounting methodology, it was proposed to apply the maximum risk of possible reversals established in the Buffer Guidelines.

In this way, applying a completely conservative criterion and given the methodological adjustment in which the occurrence of non-anthropogenic disturbances is assessed, it was decided to apply 40% as the total risk of reversals. This decision was maintained for the 2024 period.

8 EMISSION REDUCTIONS AVAILABLE FOR TRANSFER TO THE CARBON FUND⁸⁴

Year			2024	TOTAL
A.	Emission Reductions during the Reporting period (tCO2-e)	from section 4.3	9,048,719	9,048,719
B.	If applicable, number of Emission Reductions from reducing forest degradation that have been estimated using proxy-based estimation approaches (use zero if not applicable)		0	0
C.	Number of Emission Reductions estimated using measurement approaches (A-B)		9,048,719	9,048,719
D.	Percentage of ERs (A) for which the ability to transfer Title to ERs is clear or uncontested	from section 6.1	100%	
E.	ERs sold, assigned or otherwise used by any other entity for sale, public relations, compliance or any other purpose including ERs accounted separately under other GHG accounting schemes or ERs that have been set-aside to meet Reversal management requirements under other GHG accounting schemes	from section 6.4	0	0
	If applicable, any buffer replenishments	section 7.3 P	0	0
F.	Total ERs [(B+C)*D-E] minus, if applicable, any replenishments as per section 7.3, P		9,048,719	9,048,719
G.	Conservativeness Factor to reflect the level of uncertainty from non-proxy based approaches associated with the estimation of ERs during the Crediting Period	from section 5.2	15%	
H.	Quantity of ERs to be allocated to the Uncertainty Buffer $(0.15*B/A*F)+(G*C/A*F)$		1,357,307	1,357,307

⁸⁴ Spreadsheet available in https://plataforma.enccrv.cl/static/erpa/mr4/resultados/fcpf_er-mr_template_tool_sections_4_7_8_annex4_RP4_v20.xlsm. The truncated values were automatically calculated. The values calculated came from tab "Section 8". For more information consult to: https://plataforma.enccrv.cl/static/erpa/mr4/resultados/Resultados_MRV_ERPA_RP4_v20.xlsx

I.	Total Reversal Risk set-aside percentage applied to the ER program	from section 7.4	40%	
J.	Quantity of ERs to be allocated to the Pooled Reversal Buffer (F-H)*I		3,076,564	3,076,564
K.	Number of FCPF ERs (F- H – J)		4,614,848	4,614,848
L.	Percentage of Emission reductions from enhanced removals from afforestation/reforestation as a percentage of the total FCPF ERs [Optional if the country wishes to generate enhanced removals]	From section 4.3	0.00000000%	
M	Number of FCPF ERs from enhanced removals from afforestation/reforestation (L * K) [Optional if the country wishes to generate enhanced removals]		0	0

ANNEX 1: INFORMATION ON THE IMPLEMENTATION OF THE SAFEGUARDS PLANS

I. Requirements of FCPF on Managing the Environmental and Social Aspects of ER Programs

This report addresses the implementation of the Environmental and Social Management Framework (MGAS) from the National Strategy on Climate Change and Vegetation Resources (ENCCRV). The MGAS establishes the protocols, resources, and procedures necessary to address, respect, and comply with safeguards in the implementation of the Action Measures (MDA) of the ENCCRV. This includes the accounting area of Chile's Emissions Reduction Payment Agreement (ERPA) considering the period between January 1 and December 31, 2024.

For the development of this report, the baseline information contained in previous reports was updated. The reports considered were “Annex 1 of the Emissions Reduction Monitoring Report” for the period 2018-2019 and in the Safeguards Reports for the periods 2020-2021, 2022, and 2023, as well as the Safeguards Self-Reports submitted to the Fund Management Team (FMT) and validated by the World Bank in 2021, 2022, and 2023, respectively. In addition, a process was carried out to compile and update information from primary sources using surveys and interviews with professionals from the four CONAF's Technical Management departments involved in implementing activities and/or programs in the accounting area of the Emissions Reduction Program (PRE) in the according period. Specifically, we worked in coordination with each of the four professionals from CONAF's various Technical Management departments, who were appointed as counterparts to the Department of Climate Change and Environmental Services (DCCSE) and tasked with completing a digital questionnaire, which was subsequently supplemented through working meetings.

For each of the four Technical Management departments mentioned, one professional was designated as counterpart to CONAF's Department of Climate Change and Ecosystem Services (DCCSE) and was tasked with completing a digital survey, which was later supplemented through work meetings.

Previous reports include territorial activities carried out by CONAF through various programs and initiatives. These activities were categorized as follows, and the same categories are used in the present report.

- Activities in the implementation phase of the ENCCRV financed with international funds for the period 2020-2021.
- Activities carried out as pilot projects in the results-based payment (PBR) phase covering the years 2022 and 2023.
- Activities carried out through the Benefit Distribution System (SDB) through ENCCRV public tenders in 2022 and 2023.
- Emissions reduction activities carried out by CONAF in the PRE accounting area that are not managed through the SDB.

For the period covered by this report, compliance with safeguards is analyzed for those activities carried out during 2024. These are grouped into activities with PBR financing (international funds), which mainly correspond to projects awarded in the second cycle of the ENCCRV public tender in 2023. Also reported are actions from the PBR phase of the ENCCRV that are not awarded through the public tender, as they correspond to ENCCRV facilitating action measures (MF) that focus on improvements and construction of new nurseries, inspection, and environmental education. In addition, activities carried out by CONAF in different programs and initiatives that are financed with the state budget, through annual allocations in the Budget Law, and that also contribute to the fulfillment of the ENCCRV Action Measures, and the Nationally Determined Contribution (NDC) are included.

The following table presents a summary of the emission reduction activities and programs implemented by CONAF during the reporting period for the Maule, Ñuble, Biobío, La Araucanía, Los Ríos, and Los Lagos regions. These activities will continue to be implemented in their entirety in 2025, with only one change in the administration of the

activity of developing community protection plans against forest fires, which, from 2024 onwards will be implemented by the municipalities under Law N°. 21,364, which creates the National Disaster Prevention and Response System (SENAPRED) and assigns this function to the municipalities in coordination with SENAPRED. Its new name is the Community Plan for Disaster Risk Reduction. CONAF will then take on the role of technical support agency, providing fire risk maps and general guidelines so that municipalities can include this as an annex to these plans.

Tabla 1. ER activities and programs, according to national and international funding categories in the 2024 period.

Funding Category	Activities/Programs linked to ERP
i) CONAF institutional activities and programs funded by the Budget Directorate	Activities carried out within the framework of Law No. 20,283, on the Recovery of Native Forests and Forestry Promotion
	Concessions inspections in the National System of Protected Wilderness Areas (SNASPE)
	Implementation of conservation strategies in SNASPE units
	Preparation or updating of Management Plans with a strengthened SNASPE planning method
	Participatory Afforestation Program
	Tree Planting Program
	Management plans for activities carried out within the framework of Law No. 20,283
	Inspection of technical studies on native forest management approved by CONAF
	Inspection of extraction plans, clear-cutting plans, or work plans
	Controls on collection centers and truckers
	Actions that promote the production of sustainable firewood and biomass
	Property inspections and compliance checks using SAT/LEMU
	Enforcement of forestry legislation
	Investigation of third-party complaints
	Audits and training for the Controlled Burning Program
	Training, outreach, and technical transfer on the benefits of urban ecosystems, forest formations, and xerophytic formations, and promotion of participation in CONAF programs
	Large-Scale Native Forest Restoration Program
	Wildfire Preparedness Program for Communities
	Wildfire prevention training
	Preventive forestry training
	Training for teachers in the environmental education and wildfire prevention program
	Fire assessment in protected wilderness areas
	Creation, expansion, and recategorization of protected wilderness areas
	Development of conservation education plans in protected wilderness areas

ii) Actions from the ENCCRV RBP ⁸⁵ phase financed with international funds .	Direct Action Measures and Facilitating Measures of the ENCCRV financed with international funds and implemented through the Benefit Distribution System (SDB):
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Source: Prepared by the authors based on information from CONAF Technical Management units

II. Monitoring and Reporting Requirements

1. Entities that are responsible for implementing the Safeguards Plans are adequately resourced to carry out their assigned duties and responsibilities as defined in the Safeguards Plans.

The following describes the key resources and provisions for carrying out the obligations and responsibilities in implementing the MGAS for the reporting period.

1.1 Key institutional provisions for the implementation of safeguard plans

CONAF, as an entity belonging to the Ministry of Agriculture, maintained the same organizational structure as indicated in the 2023 report, as shown in Figure 1.

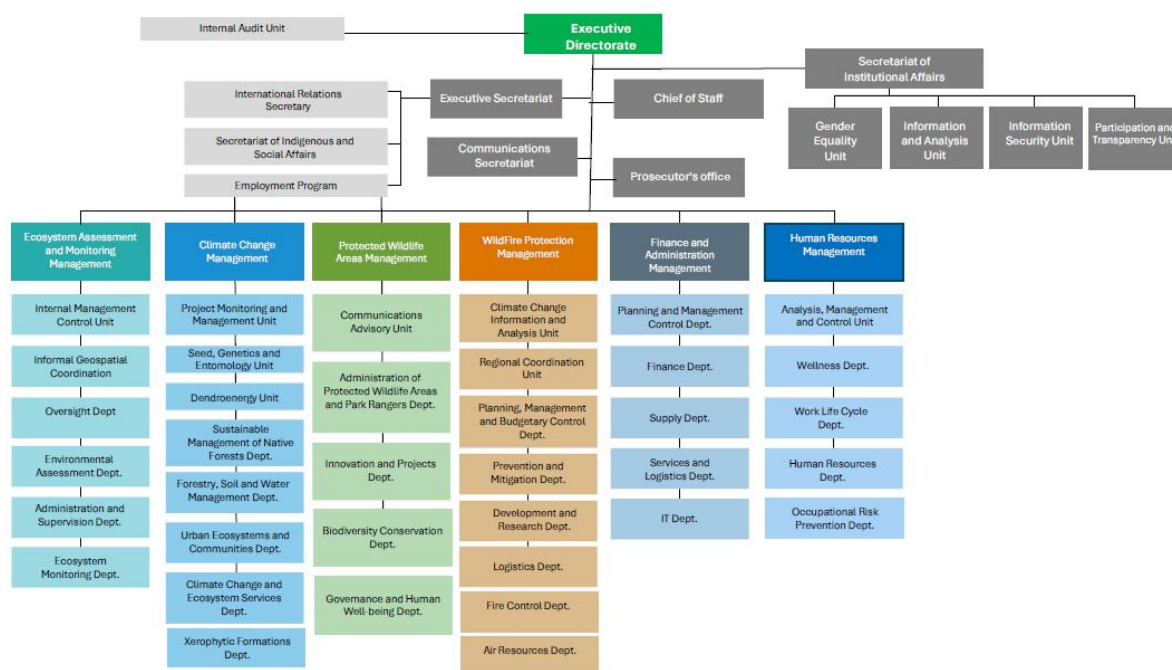


Figure 1. Organizational chart of the CONAF structure at the central level for the period 2024. **Source:** Updated based on the MGAS

The following is a list of bills and regulatory amendments for 2024 that are linked to key institutional provisions:

⁸⁵In 2019, Chile secured funding from the Green Climate Fund, and in 2022, the implementation of territorial emission reduction activities progressed under the pilot phase of the +Bosques project. The implementation of the territorial projects awarded through the 2022 public tender , which are funded by the GCF program “Proyecto +Bosques” began in 2023.

- Of particular note is the Senate's approval "in general" of the bill creating the National Forestry Service (SERNAFOR) and amending the General Law on Urban Planning and Construction, which was finally enacted in May 2025 and is expected to come into force in 2026. This new Law No. 21,744 establishes a decentralised public service under the Ministry of Agriculture, successor to the current CONAF, which is currently a public-private body. From the point of view of safeguards management, this new service acquires more powers and operational capacity to be effective in promoting vegetational formations and the components of nature associated with them. This is because, as a private law corporation, CONAF has budgetary restrictions and specific administrative procedures that differ from those of the public sector, which, among other things, make it impossible to submit bills on matters within its competence. For example, within its powers, under the new fire law mentioned in the following point, it will be able to collect fines with tax benefits, something that CONAF can currently only do by filing complaints with local police courts. This will imply that the new SERNAFOR acquires more agency regarding policy regulations making its mission more efficient and effective.
- The bill regulating the prevention of forest and rural fires, and other matters, presented with extreme urgency in 2023, has continued to be processed in the Congress of the Republic, reaching the end of 2024 in its second constitutional stage in the Senate. Under this law, there is an obligation to define urban-rural forest interface zones in territorial planning and to consider fire prevention plans, forest buffer zones, mandatory firebreaks and fines for those who do not carry out preventive work, among other provisions regarding infringements, penalties and enforcement.
- The implementation process continues for Law No. 21,600, enacted in August 2023, which creates the Biodiversity and Protected Areas Service (SBAP) and the National System of Protected Areas, with the aim of conserving biological diversity and protecting the country's natural heritage. This regulation establishes a public service, under the Ministry of the Environment, which is responsible for the conservation of biodiversity and establishes the National System of Protected Areas as its main instrument. In turn, it will be responsible for the administration of the State's protected areas, including the enforcement of Law 20,283 within the protected areas, powers that until now have been the domain of CONAF. Law 21,600 set a deadline of one year for the enactment of decrees regulating the start-up of the new service and the transfer of officials, protected areas and assets, and a deadline of two years for the regulations governing various issues. Thus, it is expected that by 2025 the Service will have its functions duly established.

During the implementation process, Law 21,600 was temporarily amended, particularly with regard to forests with species classified as "near threatened", "insufficient data" and "least concern", allowing intervention in those forests through the approval of management plans and access to subsidies for both activities within the framework of Law 20,283⁸⁶.

1.2. Human and financial resources of the entities and parties involved

During the reporting period, the roles and functioning of the working team reported during 2023 continued. In this regard, the Environmental and Social Safeguards Team was composed of three professionals from the Department of Climate Change and Ecosystem Services (DCCSE) and four professionals hired under the ENCCRV's +Bosques Project, with the aim of promoting collaborative work and forming a multidisciplinary team. Three professionals from CONAF's Secretariat for Indigenous and Social Affairs (SAIS) also provided technical support. The team continues to be organised as shown in Figure 2, with a head of safeguards, two environmental safeguards specialists,

⁸⁶Article 54 of Law No. 21,724, enacted in January 2025 and effective between 1 January 2025 and 31 December 2025.

two social safeguards specialists, a management control professional and a gender specialist. For its part, the SAIS had three professionals consisting of a head and two specialists in indigenous and social affairs.

Specifically, in relation to the +Bosques project in the PBR phase of the ENCCRV, the professional specialising in gender issues joined the safeguards team in October 2024, while maintaining her responsibility for promoting gender mainstreaming within the Department of Climate Change and Ecosystem Services (DCCSE).

Finally, during the 2024 period, the Regional Technical Teams maintained their operational and territorial implementation role for the development of ENCCRV projects and initiatives, thus ensuring respect for and compliance with the relevant safeguards. This team continues to be technically led by the Climate Change and Ecosystem Services Coordination of each region, which reports to the respective Department of Ecosystem Conservation and is supported by the person in charge of safeguards for the regional team⁸⁷, who continues to play a technical counterpart role with the central safeguards team (see Figure 2). Likewise, in the case of those regions where pilot projects and/or public tenure projects were carried out in indigenous territories, direct support for the management of project safeguards continued to be provided by the person in charge of Indigenous and Social Affairs at the regional level, who reports to the head of the SAIS. In the case of those regions where there is not yet a person with this role, support is provided from the central level of the SAIS. The following figure indicates the priority areas that contribute to the management of safeguards at the regional level in coordination with their respective counterparts at the central level. However, all other institutional units collaborate and assume the responsibilities required for the implementation of the ENCCRV.

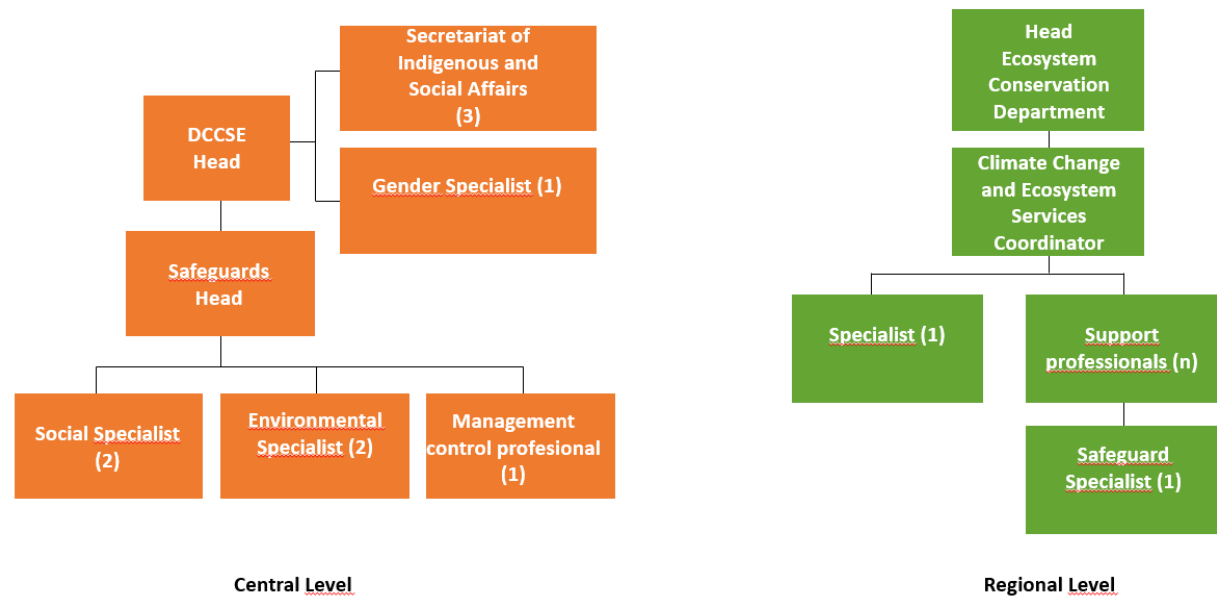


Figure 2. Composition of the environmental and social safeguards team at the central level and in the six regions of the PRE, 2024.

To date, this structure and roles remain unmodified.

⁸⁷ The regional safeguards person in charge is only present in the six regions where the RBP phase of the ENCCRV is implemented. See the 2022 ERPA report, section 1.1, for details of these roles.

The relationship and flow of information between the central units and the Regional Technical teams is shown in the following figure.

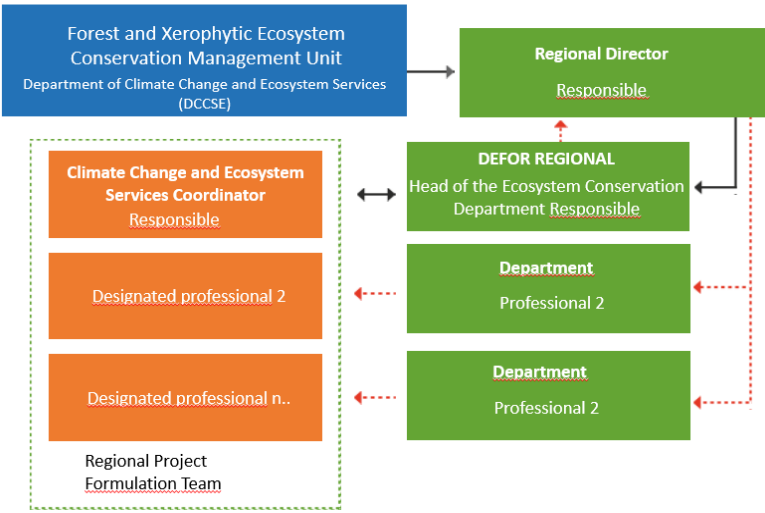


Figure 3. Technical management and safeguards flow applicable to the ENCCRV for the reported period
Source: MGAS

Although the environmental and social safeguards team has not undergone significant changes commensurate with the increase in SDB territorial projects under implementation (from 373 in 2023 to 972 in 2024), the learning and preparation period for this increase began with the first version of the public tender in 2022, during which time the safeguards team has been adapting and standardizing procedures, making them more efficient and gradually transferring responsibility and autonomy to regional teams, which has enabled appropriate environmental and social management of a greater number of projects. For example, the head office team conducted random reviews of projects, with subsequent feedback, whereas in the first and second years (2021 and 2022) a sample of projects were reviewed one by one at the central level and feedback was provided afterwards. These aleatory reviews were assigned to each safeguard central team member, who delivered a due diligence of safeguard processes and a quality assessment of the means of verification in territorial projects. The methodology used was discussed within the safeguard’s team, in order to make sure the standards were met.

The activities associated with the team responsible for safeguards, both at the central and regional levels, involve a budgetary expenditure during 2024 categorized as i) payment of salaries to central-level professionals, ii) travel expenses, iii) other capacity-building activities⁸⁸, and iv) payment of salaries to professionals in the regions. All this is done to ensure the management of institutional PRE safeguards. The details of the expenses incurred are described in the following table:

⁸⁸ For more details, see section 1.4.

Year 2024	Financing source		TOTAL (US\$)
	International (US\$)	National	
		(US\$)	
Central office – salaries	136,374	104,854	
Regional office – salaries	148,188	139,684	
Central office – expenses	7,281		
Regional office – expenses	20,224		
Other expenses	75		
Total 2024 (US\$)	387,067	244,538	631,605

Tabla 2. Expenses (in USD) associated with the management of ERP safeguards in 2024.

Table 2 classifies the expenses associated with the management of PRE safeguards according to the source of funding. In this regard, the GCF stands out as an international source and CONAF as a source of national resources from the Budget Office. It is worth noting the budget increase associated with 'Other expenses,' mainly due to the development of the 'Leadership and Sustainable Livelihoods' program for beneficiaries and the 'Agroforestry Workshops' in the six PRE regions.

1.3. Implementation of institutional arrangements

In terms of governance, institutional organization and decision-making procedures, the arrangements described in the previous point were implemented in all ENCCRV projects and CONAF activities during the 2024 period, with the responsible entities functioning correctly, together with work by the relevant regional team, highlighting the operational advantages of appointing technical counterparts for safeguards in regional teams.

Nevertheless, as mentioned in section I, each of the four CONAF's Technical Management departments has a professional designated as an information counterpart to the DCCSE on safeguards issues at the central level. This designation has the function of providing information on the work of their respective management departments with regard to safeguards and, specifically, collaborating in the preparation of reports. This informational role, as in previous reports, is functional, limited and sufficient for current requirements, as its cost has been assumed by the Corporation and there is no budget expansion plan with base funding to strengthen this specific personnel. For this reason, during the reporting period, no additional results-based financing has been provided for the ENCCRV that would involve an evaluation of the strengthening of safeguard management in the four technical management departments.

1.4. Capacity building for the Emissions Reduction Program and Safeguard Plans

It should be noted that CONAF, within the framework of the ENCCRV, developed a national environmental education program focused on climate change, plant resources and environmental services, which is the basis for the development of the activities of the environmental education action measure (MT6), comprising the following documents: i) Manual for the implementation of the educational program⁸⁹, ii) Manual for the evaluation and

⁸⁹ Available at: <https://www.enccrv.cl/programa-de-educacion>

monitoring of the educational program⁹⁰, iii) Training program for CONAF professionals, and iv) Comprehensive Plan for Environmental Education, Training and Technical Transfer of the ENCCRV's +Bosques Project.⁹¹

In addition to the above, activities have been carried out focused on the dissemination, strengthening and institutionalization of the REDD+ approach and safeguards for CONAF professionals and teams dedicated to the development and implementation of socially and environmentally sustainable projects. Furthermore, environmental education activities have been developed for other stakeholders such as territorial actors and/or potential beneficiaries, the educational community and beneficiaries of the ENCCRV's +Bosques Project. Thus, implementation during the 2024 period is confirmed for the following activities:

- 1 capacity-building course for CONAF professionals on Protected Wildlife Areas. In the Maule, Araucanía and Los Ríos regions, some of the teams of professionals attended training courses on agroforestry, together with beneficiaries of the ENCCRV's +Bosques Project⁹².
- 31 presentations to local stakeholders and/or potential beneficiaries on topics such as: strengthening female leadership, biomass and energy poverty, climate change and the importance of native forests, techniques for planting native species, composting techniques, pest management and use, agroforestry, pest management in nurseries, honey-producing forest species, preventive forestry, solid biofuels and nursery production.
- 8 workshops for the educational community, both school and university, on topics such as: the greenhouse effect and climate change, native plants identification, propagation and planting of native flora and wild mushrooms.
- 24 workshops for beneficiaries of the 'Leadership and Sustainable Livelihoods' program on topics such as beekeeping, recognition, production and planting of native plants, medicinal plants, female leadership, agroforestry, seed collection and nursery management, forest fire prevention and management, identification of edible fungi, NTFP production and essential oil extraction.

In total, 1,631 people have been trained in the 2024 period, of whom 1,101 (68%) are women and 320 (20%) belong to indigenous peoples.

As part of the safeguards support provided to regional teams, the central safeguards team has implemented complementary capacity-building, training, and technical support activities focused on the mitigation measures of the MGAS and the ENCCRV's +Bosques Project. These activities, aimed at compliance with safeguards, included virtual training related to indigenous peoples' rights and gender equality, participatory processes, safeguards tools, application of procedures, and use of the Safeguards Information System at different stages of project implementation.

Furthermore, during 2024, with the aim of implementing and increasing the participation of relevant stakeholders in the management of ENCCRV projects, a total of 412 outreach activities were carried out, including workshops, radio spots, local press, social media, and video clips in the six PRE regions, with the aim of disseminating information about the SDB and its risks and benefits, as described below:

- 12 video clips on topics such as fire prevention, public tender, progress in the implementation of the ENCCRV, and gender approach.

⁹⁰ Available at: https://redd.unfccc.int/uploads/4833_66_manual_de_aplicacio_CC_81n.pdf

⁹¹ Available at: https://plataforma.enccrv.cl/static/erpa/mr4/anexo_1/Plan_Integral_de_Educacion_Ambiental_Capacitacion_y_Transferencia_Tecnica.pdf

⁹² The beneficiaries who attended this course have been recorded under the "Beneficiaries" section to avoid double counting.

- 159 press releases at both the national and regional levels.
- Broadcasts on three local radio stations.
- 11 brochures and posters with their respective versions in Mapudungun.
- 227 communication activities on social media at the regional level, taking into account cultural relevance and gender approach. Nine REDD+ group workshops were held in five regions with the aim of reviewing and approving the respective Regional Technical Proposals of the SDB. A total of 143 people participated in the REDD+ groups, of whom 69 (48%) were women and 8 (6%) were indigenous peoples. Attendees included representatives from municipalities, public services, INFOR, NGOs, academia, small and medium-sized forest owners, and the private sector.

2. ER Program activities are implemented in accordance with management and mitigation measures specified in the Safeguards Plans.

2.1 The environmental and social documents prepared during the implementation of the Program are based on Safeguard Plans, together with the main prevention and mitigation measures specified.

In accordance with section I of this report, it should be noted that the implementation of the ENCCRV as a CONAF public policy instrument has been carried out on the basis of two types of activities: those carried out with funding allocated through the Budget Law; and those carried out through funds from multilateral organizations (international funds) that are administered directly or indirectly by CONAF, under the name of “actions of the PBR phase of the ENCCRV.”⁹³

In this regard, and in terms of safeguard approach, since the report for the 2018-2019 period, a review of the institutional operational instruments in force for the reporting period is being carried out, which, in accordance with the legal and regulatory framework in force in Chile, contribute to the prevention of risks and/or the mitigation of socio-environmental impacts for the emission reduction activities listed in Table 1, in line with the applicable safeguard requirements reflected in the MGAS and SDB processes. The results of this review are presented in Table 4, which analyzes the prevention measures contained in each of the instruments and their status of implementation for the reporting period.

The development of Table 4 once again involved coordinated work with professionals from CONAF's four Technical Management Departments, who are designated as safeguards counterparts and were tasked with completing a digital questionnaire with key information on the approach to, respect for and compliance with safeguards. This information was subsequently supplemented through interviews and/or meetings.

This Table contains a list of CONAF's management instruments aligned with the OP/BM as reflected in the MGAS, and with the SDB processes, as well as their implementation status for the 2024 reporting period, the main prevention and/or mitigation measures contemplated in these instruments, and the activities that contribute to the reduction of emissions within the PRE. Additionally, in order to facilitate the visualisation of the updates made with respect to what was reported in the 2023 period, those Table 4 cells where the texts have undergone changes or adaptations with respect to the previous report have been highlighted in grey.

Likewise, and considering that it was the subject of consultation in previous reports, it should be noted that the national approach to addressing OP 4.12 in the ENCCRV is preventive in nature, which is achieved by excluding activities that could require the physical resettlement of individuals or families, and through participatory processes applied as part of the Environmental and Social Assessment in those cases where their economic and/or subsistence

⁹³ Available at: <https://www.enccrv.cl/minuta-orientadora>

activities could be affected, thereby seeking to reach agreements and avoiding the occurrence of involuntary resettlement of economic activities.

To facilitate the implementation of these requirements in September 2023 it was published the “Minuta Orientadora para Determinar el Alcance del Reasentamiento de Uso Involuntario generado por acciones y proyectos ejecutados en la fase pagos por resultados de la ENCCRV” (See Footnote 33).

Finally, it should be explained that, unlike the ENCCRV Direct Measures, which have been awarded through public tender, the Facilitating Measures being implemented with the +Bosques project⁹⁴ apply the instruments in a differentiated manner, as can be seen in Table 4.

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
OP 4.01 Environmental Assessment (corresponding to SM7 Risk and Impact Assessment and included in SM2 Transparency and Governance⁹⁵)			
Environmental Assessment Guide "Criteria for CONAF's participation in the SEIA" ⁹⁶	Implemented	Defines the aspects and criteria to be considered by CONAF in the evaluation process of projects submitted to the SEIA.	Direct Measures of the ENCCRV
Submission of application and proposal design (On Public Tender Platform)	Implemented, updated annually	Planning tool, which, as of 2022 and annually updated, is part of the application stage of the SDB public tender and is carried out on the tender platform. It includes a preventive analysis of the possible risks or potential impacts associated with the implementation of the projects, in case that they are awarded.	Direct Measures of the ENCCRV
Environmental and Social Feasibility Assessment Questionnaire	Updated	This tool, which, starting in 2022, is part of the application phase of the BSP public tender. It is carried out in the field, with its results entered into the ENCCRV tender platform. Its purpose is to identify potential risks in project implementation. This will determine the actions to be taken if the project is awarded.	Direct Measures of the ENCCRV
Gender Action Plan +Bosques project (GAP) ⁹⁷	Implemented	Support effective participation in the implementation of the ENCCRV through recognition, assimilation, capacity building and leadership to ensure gender considerations in REDD+ actions. Through the implementation of this plan, it is hoped that the +Bosques project will promote the active participation of women and also encourage the implementation of actions that ensure women can derive value from the forestry activities they currently carry out.	Direct Measures of the ENCCRV

⁹⁴ The facilitation measures currently being implemented are those included in the +Bosques project and correspond to MT6, IF6, MT7, and GA1. For more details on these measures, see: <https://www.enccrv.cl/actividades-y-medidas-de-accion>

⁹⁵ In accordance with the cross-cutting themes of the integrated safeguards framework of the National Safeguards Approach of the ENCCRV. Available at: <https://www.enccrv.cl/salvaguardas-ambientales-y-sociales>

⁹⁶ <https://www.conaf.cl/centro-documental/guia-de-evaluacion-ambiental-criterios-para-la-participacion-de-conaf-en-el-seia-conaf-2020/>

⁹⁷ <https://www.greenclimate.fund/document/gender-action-plan-fp120-chile-redd-plus-results-based-payments-results-period-2014-2016>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
Environmental and Social Management Plan for the +Bosques project (ESMP)	Implemented ⁹⁸	A plan that presents a detailed framework for the management of environmental and social impacts and risks associated with the +Bosques project, including a set of actions, tools and institutional arrangements to ensure full compliance with the safeguards.	Direct Measures of the ENCCRV; Strengthening nurseries under ENCCRV Enabling Measure GA1. ⁹⁹
Environmental education program focused on climate change, vegetation resources, and environmental services	Implemented	A program that encompasses the fundamental aspects of the institutional strategic approach to environmental education for climate change and lays the foundation for a series of educational actions to address the challenges posed by climate change.	Enabling Measures of the ENCCRV
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries with regard to information and socio-environmental diagnoses—according to the MGAS to comply with safeguards—and the evaluation mechanisms with their criteria and weightings.. ¹⁰⁰	Direct Measures of the ENCCRV
Guidance Note for determining the scope of involuntary resettlement generated by actions and projects implemented in the results-based payment phase of the ENCCRV	Implemented	It is a supplement to Annex 7 of the MGAS and seeks to operationalise the way in which the scope of Involuntary Resettlement is determined in relation to uses, with the aim that both regional technical teams and anyone responsible for implementation can apply it in the territories where the investments of the results-based payment phase operate and it is identified that these same investments, or any decision taken on the territory, have an effect that limits, displaces or extinguishes the different types of 'uses' (productive, subsistence, recreational, traditional, culturally significant, religious, medicinal, etc.) that individuals, indigenous communities, local communities, organisations or other human groups have been making of the ecosystem services that form part of their livelihoods and ways of life.	Direct Measures of the ENCCRV
Guide for the Participation of Local and Indigenous Communities in ENCCRV Projects ¹⁰¹	Implemented	A practical tool to support participation processes throughout the project cycle, providing regional teams with guidance, concepts, methodologies, and techniques to ensure respect for and compliance with safeguards. Its application particularly facilitates the work of those who implement the	Direct Measures of the ENCCRV

⁹⁸ <https://www.enccrv.cl/esmp-ingles>

⁹⁹ Investments in nursery infrastructure are made through a public tender and, for those processes that do not participate in the tender, an Environmental and Social Assessment (ESA) is carried out and an ESMP is prepared.

¹⁰⁰ Available files from 2022 to 2025 at: <http://concurso.enccrv.cl/Documentos2>

¹⁰¹ Available at: <https://www.enccrv.cl/guia-participacion-comunidades>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
		Action Measures (MDA), by guaranteeing the right to participation and the integration of the other standards of the National Safeguards Approach. The Consultation and Participation safeguard is recognized as a pillar of the ENCCRV safeguards, as its full and effective implementation through the involvement of stakeholders allows for the management of the other cross-cutting areas and ensures full compliance with all safeguards.	
OP 4.04 Natural habitats (included in SG8 Conservation of natural habitats and biodiversity and SG2 Transparency and governance)			
Supreme Decree No. 2 from 2024 MMA - Approval of the classification of species 19th Process ¹⁰²	Implemented, Updated annually	It establishes the conservation category of the different native species of the country in accordance with the procedure established in the regulation for the classification of wild species (DS No. 29 2011 MMA).	Activities carried out within the framework of Law No. 20.283
SNASPE Ecotourism Concessions Inspection Manual	Implemented	Recreational services and, in general, those associated with special interest tourism must ensure that such development is compatible with the general and specific objectives that motivated the creation of the correspondent protected wilderness areas.	Inspection of concessions in the SNASPE
SNASPE Manual for the Management Planning of Protected Areas ¹⁰³	Implemented	It establishes the guidelines associated with zoning and territorial analysis, cultural conservation objects and objects of human well-being, participation aspects, climate change vulnerability analysis, logical framework matrix, operational plans, monitoring, among others, in order to ensure the protection of the protected wilderness areas that are part of the SNASPE.	Development or updating of management plans using the SNASPE's strengthened planning method; Implementation of conservation strategies in SNASPE units
Protected Areas according to Law No 18.378	Implemented	It establishes prohibitions on the cutting of trees and shrubs present in 16 areas within the territory of the Emissions Reduction Program, through Supreme Decrees, leaving CONAF in charge of authorizing and supervising the provisions of this law and its associated decrees.	Preparation or updating of management plans with the strengthened SNASPE planning method
Environmental and Social Management Plan for the +Bosques project (ESMP)	Implemented	Plan that presents a detailed framework for the management of environmental and social impacts and risks associated with the +Bosques project, where a set of actions, tools and institutional arrangements are described to ensure full compliance with the safeguards.	Direct Measures of the ENCCRV
Environmental education program focused on climate change, vegetation resources,	Implemented	It encompasses the fundamental aspects of the institutional strategic approach to environmental education for climate change and lays the foundation for educational initiatives to address the challenges posed by climate change.	Enabling Measures of the ENCCRV

¹⁰² Available at: https://clasificacionespecies.mma.gob.cl/wp-content/uploads/2024/05/DS_02-24_MMA_Aprueba_19noRCE_TRANSCRIPTO_Publicacion_DO.pdf

¹⁰³ <https://www.conaf.cl/centro-documental/manual-para-la-planificacion-del-manejo-de-las-areas-protegidas-del-snaspe/>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
and environmental services			
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries with regard to information and socio-environmental diagnoses—according to the MGAS to comply with safeguards—and the evaluation mechanisms with their criteria and weightings. ¹⁰⁴	Direct Measures of the ENCCRV
OP 4.09 Pest Management (included in SG 10 Pollution Prevention and Integrated Pest Management and SG 12 Health, Safety and Decent Rural Work and SG2 Transparency and Governance)			
List of SAG pesticides ¹⁰⁵	Implemented	List of authorized pesticides, approved according to the WHO classification, taking into consideration a rigorous evaluation process and requirements indicated in the international conventions signed by Chile (Resolution No. 1,557 of 2014)	Participatory Afforestation Program; Large-Scale Native Forest Restoration Program
Pesticide applicator certification ¹⁰⁶	Implemented	Establishment of guidelines for obtaining a card that recognizes that the applicator is trained in the use and handling of agricultural pesticides, according to the reference framework established by SAG (exempt resolution No. 2029/2017).	Participatory Afforestation Program; Large-Scale Native Forest Restoration Program
Basic Guide to Good Practices for Small and Medium-Sized Forest Plantations Owners ¹⁰⁷	Implemented	It establishes a series of technical recommendations aimed at site preparation, soil recovery and planting that includes aspects such as correct management of plant waste, pest and disease control techniques, among others.	Activities carried out within the framework of Law No. 20.283
Risk prevention and induction manual for staff of the Forest and Xerophytic Ecosystem Conservation Management System ¹⁰⁸	Implemented	It is part of CONAF's occupational risk prevention policy and contains a list of risks associated with personnel activities, as well as recommended preventive measures and safe work methods. Chapter 6, "Risk Prevention in Farm Activities", outlines measures for pesticide use and personal protection.	Participatory Afforestation Program; Large-Scale Native Forest Restoration Program
Environmental and Social Management Plan for the +Bosques project (ESMP)	Implemented	Plan that presents a detailed framework for the management of environmental and social impacts and risks associated with the +Bosques project, where a set of actions, tools and institutional arrangements are described to ensure full compliance with the safeguards.	Direct Measures of the ENCCRV

¹⁰⁴ Available files from 2022 to 2025 at: <http://concurso.encrv.cl/Documentos2>

¹⁰⁵ <https://www.sag.gob.cl/content/lista-de-plaguicidas-2023>

¹⁰⁶ <https://www.sag.gob.cl/tramites/solicitud-de-credencial-de-reconocimiento-como-aplicador-de-plaguicidas-de-uso-agricola>

¹⁰⁷ <https://www.curriculumnacional.cl/portal/Educacion-Tecnico-Profesional/Especialidad-Forestal/Plan-3/217214:CONAF-2013-Guia-basica-de-buenas-practicas-para-plantaciones-forestales-de-pequenos-y-medianos-propietarios>

¹⁰⁸ Available on the CONAF intranet

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries with regard to information and socio-environmental diagnoses—according to the MGAS to comply with safeguards—and the evaluation mechanisms with their criteria and weightings. ¹⁰⁹	Direct Measures of the ENCCRV
OP 4.36 Forests and Plantations (included in SG8 Conservation of natural habitats and biodiversity, SG9 Sustainable management of forests and natural resources and SG2 Transparency and governance)			
CONAF National Forestry Extension Program	Implemented	Collaborate with institutional professionals in tasks associated with the implementation of Law No. 20.283, such as providing professional advice to small and medium-sized forest owners who do not have the means to hire these services; training owners for the correct execution of tasks, and supervision of these tasks during their development, among others.	Participatory Afforestation Program; Large-Scale Native Forest Restoration Program
Technical procedures manual for the tree planting program	Implemented	Promote the generation of ecosystem services by planting trees in urban and peri-urban parks, considering the use of plants with heritage and cultural value (native and/or conservation species), while contributing to the dissemination of the benefits they provide to society to improve the quality of life of the population.	Tree planting program
Application form for the tree planting program ¹¹⁰	Implemented	It contains a list of aspects that the applicant must take into account when applying to the tree planting program, including the commitment to care for plants according to the technical recommendations of CONAF and the acceptance of monitoring and evaluation actions, among others.	Tree planting program
Considerations for the formulation of the Native Forest Management Plan, Law No. 20.283	Implemented	It establishes the technical requirements for planning the management of ecological heritage or the sustainable use of forest resources on a given site, including safeguarding water quality and avoiding soil deterioration.	Management plans awarded

¹⁰⁹ Documents available from 2022 to 2025: <http://concurso.enccrv.cl/Documentos2>

¹¹⁰ <https://www.conaf.cl/manejo-de-ecosistemas/programa-de-arborizacion/entrega-de-plantas/>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
Forms for management plans ¹¹¹	Implemented	Set of standards and technical requirements associated with the management, organization, and preservation of native forests, or according to the forest type, as well as certificates of accreditation of management plans and activities contemplated in Law No. 20.283 (includes a form for correction plans).	Management Plans awarded; Oversight of technical studies on native forest management approved by CONAF; Oversight of extraction plans, simple cutting permit, or work plans.
Application rules for the Native Forest Conservation, Recovery and Sustainable Management Fund ¹¹²	Updated	Application Rules for 2024. Establishes in detail the various eligible activities according to sections A), B) and C) of Law No 20.283 on the recovery of Native Forests.	Activities carried out within the framework of Law No. 20.283
Supreme Decree No. 68, list of tree and shrub species native to the country	Implemented	Based on a series of scientific studies, the list of native shrub and forest species in the country that may be eligible for bonuses is defined.	Activities carried out within the framework of Law No. 20.283
Supreme Decree No. 2 from 2024 MMA - Approval of the classification of species 19th Process ¹¹³	Implemented, Updated annually	It establishes the conservation category of the different native species of the country in accordance with the procedure established in the regulation for the classification of wild species (DS No. 29 2011 MMA).	Activities carried out within the framework of Law No. 20.283
Free transit guides for the transport of native forest products	Implemented	It certifies that the primary products of the native forest (as listed) come from a cut authorized by CONAF through a management plan, management norm or simple cutting permit.	Activities carried out within the framework of Law No. 20.283; Inspections at collection centres and on roadways
CONAF's Wood Energy Strategy 2015-2030	Implemented	It promotes the sustainable production and efficient use of forest biomass as a non-conventional renewable energy to contribute to the country's energy security and independence, through the inclusion and delivery of capacities to small-scale owners of native forests, plantations and micro-enterprises in the sector.	Actions that promote the production of sustainable firewood and biomass
National Firewood Certification System ¹¹⁴	Implemented	This certification standard, composed of four principles verified through documents, measurements, records, and other means of proof, highlighting the origin of the firewood and requiring compliance with the Forest Management Plan, has come to be administered by the Ministry of Energy and is currently called the Firewood Quality Seal. CONAF's work continues through the Dendroenergy	Actions that promote the production of sustainable firewood and biomass

¹¹¹ <https://www.conaf.cl/tramites/permisos-bosque-nativo-y-formaciones-xerofiticas/>

¹¹² <https://concursolbn.conaf.cl/seccion/documentos.php>

¹¹³ Available at: https://clasificacionespecies.mma.gob.cl/wp-content/uploads/2024/05/DS_02-24_MMA_Aprueba_19noRCE_TRANSCRIPTO_Publicacion_DO.pdf

¹¹⁴ <https://www.sellocalidadlena.cl/>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
		Strategy to ensure that users who collect and sell firewood achieve certification status.	
Guide to good practices on tools to combat and prevent illegal logging activities and associated trade ¹¹⁵	Not implemented ¹¹⁶ In 2024, the document continues to be reviewed within the framework of EGILAT. ¹¹⁷	It provides a series of tools and technologies to establish traceability and determine the origin of wood in order to support the management of inspection and controls at collection centres and on roadways.	Inspections of collection centers and on roadways; Property inspections and compliance controls through SAT/LEMU
CONAF's Forest Administration and Monitoring System (SAFF)	Implemented	Tool that supports institutional management to protect ecosystems and environmental heritage from illegal practices in forest resources.	Review of third-party complaints; Monitoring of forestry legislation compliance; Monitoring of extraction plans, simple cutting permit, or work plans
Instructions and form for the filing of complaints by third parties for alleged violations of forestry legislation ¹¹⁸	Implemented	The form, which can be submitted in person, in writing, or through the institutional website, allows complaints to be classified according to the type of natural resource affected, highlighting the section focused on Native Forest, Water Resources, and others. The latter may include species or sites of cultural significance for local and indigenous communities.	Monitoring of third-party complaints
Logging and Extraction Monitoring Unit (LEMU) ¹¹⁹	Implemented	The Forest Extraction and Harvest Monitoring System is a remote sensing tool that allows for the detection of changes in vegetation cover at the national level, facilitating territorial deployment and the allocation of monitoring resources.	Property inspections and compliance controls through SAT/LEMU

¹¹⁵ <https://www.conaf.cl/centro-documental/buenas-practicas-en-herramientas-para-combatir-y-prevenir-las-actividades-de-tala-ilegal-y-comercio-asociado/>

¹¹⁶ CONAF is not authorized to certify the legal trade of timber products. However, companies involved in this trade use copies of the logging management plans issued by CONAF under Law 20,283 and transport dispatch guides to validate that the timber was harvested with authorization from a CONAF management plan.

¹¹⁷ APEC Expert Group on Illegal Logging and Associated Trade.

¹¹⁸ <https://oficinavirtual.conaf.cl/denunciaTerceros/index.php?x=1>

¹¹⁹ <https://sites.google.com/conaf.cl/lemuconaf/inicio>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
National Fire Use Guidelines ¹²⁰	Implemented	It establishes criteria and measures to be implemented in each region with the aim of ensuring that fire is used as a safe tool for managing plant waste, in addition to defining the special situations in which the use of fire implies the generation of burning plans, highlighting the existence of Native Forest on the property (Araucanía Region only) and proximity to SNASPE (all regions of the country).	Controlled burning program inspections and training
Guide to burning alternatives as part of the training program	Implemented	Project for alternative fire use to reduce negative externalities, such as environmental pollution and the risk of wildfires.	Controlled burning program inspections and training
Environmental and Social Management Plan for the +Bosques project (ESMP)	Implemented	Plan that presents a detailed framework for the management of environmental and social impacts and risks associated with the +Bosques project, where a set of actions, tools and institutional arrangements are described to ensure full compliance with the safeguards.	Direct Measures of the ENCCRV
General Guidelines of the Large-Scale Native Forest Restoration Program – Siembra por Chile	Updated	It establishes the framework within which activities will be developed, along with general project assignment criteria, technical criteria, administrative procedures, and a description of reporting and monitoring. Priority is given to activities to initiate in situ restoration processes, the Seed Collection Program, and nursery strengthening. The restoration practices to be implemented by the program are indicated, prioritizing conservation and protection zones for soils, wetlands, headwaters, and water bodies.	Large-Scale Native Forest Restoration Program
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries with regard to information and socio-environmental diagnoses—according to the MGAS to comply with safeguards—and the evaluation mechanisms with their criteria and weightings.	Direct Measures of the ENCCRV
OP 4.10 Indigenous Peoples (corresponding to SG4 Indigenous Peoples and included in SG2 Transparency and Governance)¹²¹			
Regional participatory forestry programs	Implemented	Aimed at promoting the motivation and active collaboration of all involved parties/social actors, enabling them to share ideas and experiences, in order to seek solutions in a participatory manner.	Participatory Forestry Program

¹²⁰ https://avisoenlinea.conaf.cl/documentos/Instruc_Adms_Uso_Fuego.pdf

¹²¹ See Table 9 from annex 1 MR3 for more details about how the MGAS offers management procedures.

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
Application rules for the Native Forest Conservation, Recovery and Sustainable Management Fund ¹²²	Updated	Application rules for 2024. Establishes in detail the various eligible activities according to sections A), B) and C) of Law No. 20.283 on the recovery of native forests.	Training, dissemination, and technical transfer regarding the benefits of urban ecosystems and forest and xerophytic formations, as well as the promotion of participation in CONAF programs
SNASPE Ecotourism Concessions Inspection Manual	Implemented	This implies that concession contracts in protected wild areas that overlap with ADI (Indigenous Development Areas) must reflect the existing agreements between CONAF and CONADI, specifically regarding the definition of the form of participation of the existing indigenous communities in the ADI.	Inspection of concessions in the SNASPE
Manual for the Management Planning of SNASPE Protected Areas ¹²³	Implemented	It establishes community participation as a central axis in planning to involve the community in the management of the SNASPE and strengthen its various territorial units, as well as to better incorporate their valuable natural and cultural heritage and contribute to the development of their areas of influence through the SNASPE advisory councils.	Development or updating of management plans using the SNASPE's strengthened planning method; Implementation of conservation strategies in SNASPE units
Framework for Community Participation in the Management of SNASPE	Implemented	Technical theoretical framework for updating the scope and mechanisms for public participation in the protected areas of the National System of Protected Wilderness Areas (SNASPE).	Preparation or updating of management plans with the improved SNASPE planning method
Manual for SNASPE staff: tools for managing socio-environmental conflicts in State Protected Wilderness Areas ¹²⁴	Implemented	Manual aimed at strengthening the institutional management of Protected Wilderness Areas administration teams in the prevention and management of socio-environmental conflicts, through a series of proposed approaches and tools.	Implementation of conservation strategies in SNASPE units
Institutional strategy for training park rangers and administrators of Protected Wilderness Areas	Implemented	The strategy remained in force until 2021 and has not been formally replaced, although its guidelines and lines of action continue to be applied in operational management. Continuity is ensured in capacity building in priority areas, such as collaborative management of socio-environmental conflicts, implementation of participatory mechanisms for territorial agreements, and	Implementation of conservation strategies in SNASPE units

¹²² <https://concursolbn.conaf.cl/login/index.php>

¹²³ <https://www.conaf.cl/centro-documental/manual-para-la-planificacion-del-manejo-de-las-areas-protegidas-del-snaspe/>

¹²⁴ SNASPE Staff Manual; Tools for Managing Socio-Environmental Conflicts in State-Managed Protected Wildlife Areas
<https://www.conaf.cl/centro-documental/manual-para-la-gestion-del-snaspe/?ind=1718802803436&filename=MANUAL%20DE%20CONFLICTO%20AP%20CONAF%202018.pdf&wpdmdl=59557&refresh=68c06b5ce5fc01757440860>

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
		incorporation of intercultural approaches that recognize the traditional knowledge and collective rights of indigenous peoples and local communities, in line with national and international regulatory frameworks.	
Methodology for the Development of Community Wildfire Prevention Plans ¹²⁵	Implemented	The methodology aims to strengthen and improve community participation in wildfire prevention and for this purpose it includes a series of technical recommendations and tools (annexes) that facilitate this process, such as: the formation of a community council, the checklist of community workshops and the validation of the draft plan with the community.	Wildfire Preparedness Program for Communities; Development of Community Protection Plans in Risk Areas
+Bosques Project Action Plan for Indigenous Peoples (IPAP) ¹²⁶	Implemented ¹²⁷	Plan that defines the procedures to ensure that all project activities implemented in the territories of Indigenous Peoples are carried out under the principles of Free, Prior and Informed Consent (FPIC), with full respect for their rights, culture, traditional knowledge and practices, territorial and development vision, and traditional decision-making processes.	Direct Measures of the ENCCRV
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries with regard to information and socio-environmental diagnoses—according to the MGAS to comply with safeguards—and the evaluation mechanisms with their criteria and weightings.	Direct Measures of the ENCCRV
Guidance Note for determining the scope of involuntary resettlement generated by actions and projects implemented in the results-based payment phase of the ENCCRV	Implemented	It is a supplement to Annex 7 of the MGAS and seeks to operationalise the way in which the scope of Involuntary Resettlement is determined in relation to uses, with the aim that both regional technical teams and anyone responsible for implementation can apply it in the territories where the investments of the results-based payment phase operate and it is identified that these same investments, or any decision taken on the territory, have an effect that limits, displaces or extinguishes the different types of 'uses' (productive, subsistence, recreational, traditional, culturally significant, religious, medicinal, etc.) that individuals, indigenous communities, local communities, organisations or other human groups have been making of the ecosystem services that form part of their livelihoods and ways of life.	Direct Measures of the ENCCRV

¹²⁵ <https://www.conaf.cl/incendios/prevencion-y-mitigacion/comunidades-preparadas-frente-a-los-incendios-forestales/>

¹²⁶ <https://www.enccrv.cl/ipap-ingles>

¹²⁷ Document approved in June 2024.

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
Guide for the Participation of Local and Indigenous Communities in ENCCRV Projects	Implemented	A practical tool to support participation processes throughout the project cycle, providing regional teams with guidance, concepts, methodologies, and techniques to ensure respect for and compliance with safeguards. Its application particularly facilitates the work of those who implement the Action Measures (MDA), by guaranteeing the right to participation and the integration of the other standards of the National Safeguards Approach. The Consultation and Participation safeguard is recognized as a pillar of the ENCCRV safeguards, as its full and effective implementation through the involvement of stakeholders allows for the management of the other cross-cutting areas and ensures full compliance with all safeguards.	Direct Measures of the ENCCRV
OP 4.11 Physical Cultural Resources (corresponding to SG6 Cultural Heritage and included in SG2 Transparency and Governance)			
Manual for the Management Planning of SNASPE Protected Areas	Implemented	It establishes the guidelines associated with zoning and territorial analysis, cultural conservation and human well-being targets, participation aspects, climate change vulnerability analysis, logical framework matrix, operational plans and monitoring, among others, in order to ensure the protection of the Protected Wilderness Areas.	Preparation or updating of management plans with the improved SNASPE planning method
Framework for community participation in the management of SNASPE	Implemented	Technical theoretical framework for updating the scope and mechanisms for citizen participation in protected areas of the National System of Protected Wilderness Areas (SNASPE).	Preparation or updating of management plans with the improved SNASPE planning method
Implementation of conservation strategies in SNASPE units	Implemented	Training in conflict management, agreement management, and respect for the knowledge and rights of Indigenous Peoples and local communities.	Implementation of conservation strategies in SNASPE units
Forms for management plans	Implemented	Set of standards and technical requirements associated with management, voluntary regulation of management activities, and forest preservation of native forests.	Awarded management plans
+Bosques Project Action Plan for Indigenous Peoples (IPAP)	Implemented	Plan that defines the procedures to ensure that all project activities implemented in the territories of Indigenous Peoples are carried out under the principles of Free, Prior and Informed Consent (FPIC), with full respect for their rights, culture, traditional knowledge and practices, territorial and development vision, and traditional decision-making processes.	Direct Measures of the ENCCRV
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries	Direct Measures of the ENCCRV

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
		with regard to information and socio-environmental diagnoses—according to the MGAS to comply with safeguards—and the evaluation mechanisms with their criteria and weightings.	
Guide for the Participation of Local and Indigenous Communities in ENCCRV Projects	Implemented	A practical tool to support participation processes throughout the project cycle, providing regional teams with guidance, concepts, methodologies, and techniques to ensure respect for and compliance with safeguards. Its application particularly facilitates the work of those who implement the Action Measures (MDA), by guaranteeing the right to participation and the integration of the other standards of the National Safeguards Approach. The Consultation and Participation safeguard is recognized as a pillar of the ENCCRV safeguards, as its full and effective implementation through the involvement of stakeholders allows for the management of the other cross-cutting areas and ensures full compliance with all safeguards.	Direct Measures of the ENCCRV
OP 4.12 Involuntary resettlement¹²⁸			
Framework for community participation in the management of SNASPE	Implemented	Technical theoretical framework for updating the scope and mechanisms for citizen participation in the protected areas of the National System of Protected Wilderness Areas (SNASPE).	Preparation or updating of management plans with the improved SNASPE planning method
Implementation of conservation strategies in SNASPE units	Implemented	Training in conflict management, agreement management, respect for the knowledge and rights of Indigenous Peoples and local communities	Implementation of conservation strategies in SNASPE units
Forms for management plans	Implemented	Set of standards and technical requirements associated with management, voluntary regulation of management activities, and forest preservation of native forests.	Awarded management plans
+Bosques project Action Plan for Indigenous Peoples (IPAP)	Not implemented	Plan that defines the procedures to ensure that all project activities implemented in the territories of Indigenous Peoples are carried out under the principles of FPIC, with full respect for their rights, culture, traditional knowledge and practices, territorial and development vision, and traditional decision-making processes.	Direct Measures of the ENCCRV
Technical and Administrative Terms and Conditions of ENCCRV's Public Tender	Implemented, Updated annually	They establish aspects such as: objectives, territorial scope, beneficiary population, application requirements, exclusion criteria and calendar, amounts to be financed according to surface area and eligible action measures, together with the competitive system (stages, attention, withdrawal, and collaboration agreements), the professional support and advice provided by CONAF throughout the operational cycle, the obligations of beneficiaries with regard to information and socio-environmental diagnoses—according to the MGAS to comply with	Direct Measures of the ENCCRV

¹²⁸ See Table 9 from annex 1 MR3 for more details about how the MGAS offers management procedures.

CONAF management instruments, in line with the MGAS	Status for the period 2024	Description of prevention/mitigation measure	Activities to which it applies
		safeguards—and the evaluation mechanisms with their criteria and weightings.	
Guidance note for determining the scope of involuntary resettlement generated by actions and projects implemented in the RBP phase of the ENCCRV	Implemented	It is a supplement to Annex 7 of the MGAS and seeks to operationalize the way in which the scope of Involuntary Resettlement is determined in relation to uses, with the aim that both regional technical teams and anyone responsible for implementation can apply it in the territories where investments in the results-based payment phase operate and it is identified that these same investments, or any decision taken regarding the territory, have an effect that limits, displaces, or extinguishes the different types of “uses” (productive, subsistence, recreational, traditional, culturally significant, religious, medicinal, etc.) that individuals, indigenous communities, local communities, organizations, or other human groups have been giving to the ecosystem services that are part of their livelihoods and ways of life.	Direct Measures of the ENCCRV
Guide for the Participation of Local and Indigenous Communities in ENCCRV Projects	Implemented	A practical tool to support participation processes throughout the project cycle, providing regional teams with guidance, concepts, methodologies, and techniques to ensure respect for and compliance with safeguards. Its application particularly facilitates the work of those who implement the Action Measures (MDA), by guaranteeing the right to participation and the integration of the other standards of the National Safeguards Approach. The Consultation and Participation safeguard is recognized as a pillar of the ENCCRV safeguards, as its full and effective implementation through the involvement of stakeholders allows for the management of the other cross-cutting areas and ensures full compliance with all safeguards.	Direct Measures of the ENCCRV

Table 4. Institutional instruments containing prevention/mitigation measures linked to the environmental and social safeguards described in the MGAS. **Source:** Prepared by the authors based on information provided by CONAF's technical management department.

For the reporting period, the following significant updates are included, which are highlighted in Table 4:

In the group of CONAF institutional activities and programs that received funding from the Budget Office, as indicated in section I and Table 1, responsibility and administration of the Community Protection Plans against forest fires will be transferred to the municipalities in coordination with SENAPRED from 2024 onwards, changing its name to Community Plans for Disaster Risk Reduction, with CONAF taking on the role of technical support agency, providing fire risk maps and general guidelines so that municipalities can include this as an annex to these plans. The instrument Methodology for the Development of Community Forest Fire Prevention Plans no longer has a role in this program. The legislation in force has a regulation governing Community Plans for Disaster Risk Reduction, established in Decree 86 of the Ministry of the Interior and Public Security, published on 17 October 2023. It establishes the rules for the development and management of these plans. In addition, funding is available to municipalities for the management of these plans, and tools are available to the general public, such as instructions

and a format, among others. It is worth mentioning that one of its fundamental pillars is to strengthen the governance of disaster risk management, seeking to bring together the will and concrete commitments of all actors in the System. This is in order to promote, strengthen and implement initiatives with the necessary and broad support of the parties involved, through active participation and co-construction.

Annually, the activities of the Large-Scale Native Forest Restoration Program 'Siembra por Chile' has defined guidelines that will give continuity in 2024 to large-scale native forest and xerophytic formation restoration initiatives, including multiple-use activities in native forests, restoration of land affected by forest fires, and afforestation/revegetation for the creation of new forest and xerophytic ecosystems.

The yearly update of certain instruments is highlighted, such as the Classification of Species in Conservation Categories, technical and administrative bases for public tenders under the Native Forest Law and the ENCCRV, changes that must always be taken into account by professionals who apply Law No. 20,283 when developing management plans, supervising, and disseminating institutional programs.

In addition, it is noted that the Logging and Extraction Monitoring Unit (LEMU), Forest Extraction and Harvesting Monitoring System, is in the process of formulating an automation process to begin in 2025, with support from the FAO through the +Bosques project.

In the group of actions in the PBR phase of the ENCCRV, corresponding to Direct Action Measures and Facilitating Measures of the ENCCRV financed with international funds and implemented through the Benefit Distribution System, considering that in the reporting period, the Direct Measures of the PBR phase of the ENCCRV are implemented under the modality of 'territorial intervention projects' awarded through public tender, the environmental and social assessment forms and instruments are reviewed annually for each tender cycle. For example, for the submission of applications to the tender platform, updates and improvements are made to the form, which for 2024 is called 'Submission of the application and design of the proposal'. The Feasibility Assessment and its respective Environmental and Social Feasibility Guidelines were also updated in order to provide regional teams with tools for assessing critical risks that could affect the sustainability of interventions. To date, whenever a situation represented a critical risk during the Feasibility Assessment, prevention measures were indicated for its approval, furthermore, no critical risks were identified in approved territorial projects. In addition, progress was made on the ENCCRV's +Bosques Project instruments, specifically the approval of the IPAP by the FVC in June 2024.

During 2024, a new instrument was generated, it is a document that must be sent to all landowners who signed a Collaboration Agreement with CONAF, within the framework of their commitments to the SDB activities implemented on their properties. The purpose of the letter called "Project Closure Letter", is to provide administrative closure to the territorial project, as well as to include technical recommendations, which include aspects of legal compliance and environmental care, for maintaining the implementation on the property. In addition, a closure survey was developed, which must be administered to at least 15% of the landowners participating in the projects that have already been closed, maintaining the representativeness of the beneficiary population at the regional level. The objective of the survey is to obtain qualitative information regarding the perception of the interventions by the permanent direct beneficiaries. In the case of indigenous communities, the guideline is to hold a closing workshop to gather the same information.

2.2. The entities responsible for implementing the Safeguard Plans maintain consistent and complete records of the Emissions Reduction Program activities.

With regard to the records associated with the activities of the Emissions Reduction Program, it is confirmed that all activities carried out by CONAF with the national budget in the 2024 period have their respective management indicators within the Institutional Management Information System (SIGI)¹²⁹. This means that complete and consistent records are available for the management instruments listed in Table 4.

This information is reviewed and validated by Regional Management Control Officers, with the aim of identifying the main differences between the established goals and the results achieved, which is ultimately reflected in regional results reports. After being reviewed and summarized, these reports are used to generate a consolidated results report at the national level. If any deviation between planning and actual progress is identified, an institutional SIGI follow-up report is developed containing corrective action measures. In this context, some modifications were identified for the 2024 period, one of which is the aforementioned modification of the entities executing the Community Plans for Disaster Risk Reduction and others in the formula for the indicators, with the aim of improving the coverage and effectiveness of the activities that continue to be carried out and are mentioned below.

A relevant modification linked to the aforementioned change in implementing entities is that, given that this change led to a reorganization of activities at CONAF, it was possible to incorporate for the first time a report and follow-up on the support provided to the Prepared Communities Program in response to forest fires, involving 29 communities between Maule and Los Lagos and 56 nationwide.

Another modification of management indicators was made to evaluate the effectiveness of participation in Protected Areas. In 2023, compliance with the agreements committed to existing participation mechanisms was measured, while in 2024, effectively managed Protected Areas that implement participation and engagement actions for good governance were considered, an aspect that focuses on participatory processes.

This indicator aims to strengthen community participation and engagement in State Protected Areas by conducting assessments, where appropriate, and implementing actions to stimulate or strengthen the participation of local communities linked to the protected area. To comply with the indicator, protected areas that enter the SIGI must carry out an initial diagnosis to identify local actors, their interests, and existing mechanisms for participation in the Protected Areas; and formulate new mechanisms and/or processes to strengthen the participation of the local community in the management of the protected area. Protected areas that have been part of SIGI from 2018 to 2023 must implement proposed actions, mechanisms, tools, and/or processes to strengthen local community participation in the local governance of the protected area (e.g., agreements, negotiations, joint actions, creation of advisory councils, management councils, etc.) for the respective year. To complement this indicator there is a record of more than 80 agreements in force as of 2024 in the Protected Areas between Maule and Los Lagos, with stakeholders such as universities, local governments, indigenous organizations, conservation NGOs, forestry companies, among others.

In this aspect, the activities directly governed by the MGAS mitigation/prevention measures, corresponding to activities implemented with PBR funding, have records and means of verification consistent with the measures

¹²⁹ SIGI is an information system designed to measure institutional performance, with the aim of monitoring, tracking, and evaluating the results of institutional management.

applied. These include the following: Collaboration Agreement between CONAF and the owner(s); attendance lists for training and technical assistance activities, results reports, meeting minutes, field visit records, among others.

In particular, the ENCCRV's SIS is the key tool for monitoring the procedures established in the MGAS and for reporting on compliance with safeguards in projects awarded through public tender and, therefore, those actions in the RBP phase financed with international funds.

The SIS has continued to improve its operability together with the ENCCRV information management (web) platform of which it is a part, with adaptations such as an adjustment to the scale of projects on the ENCCRV platform, making it possible to manage not only single-property projects but also multi-property projects. In turn, in 2024, a significant update was made to the SIS, involving a reconceptualization of risks, prevention measures, and verification methods adjusted not only to the new multi-property scale, but also to the real condition, and magnitude of the ENCCRV's +Bosques Project, which facilitates the user experience of the System. This update has been accompanied by ongoing training workshops for regional teams on the correct use of the platform.

Information on projects submitted through the ENCCRV public tender is systematized and managed through the Tender Platform. Once these are awarded, a scheduled migration to the ENCCRV platform¹³⁰ is carried out, allowing the project formulation to move forward through the collection of environmental and social baseline information, the completion of the environmental and social assessment, the generation of the PGAS, and the monitoring of the implementation of the activities and preventive measures planned for the projects.

With regard to the use of the ENCCRV platform, the information on all the projects awarded by the regional teams has not yet been fully uploaded, mainly due to the considerable workload, recent system updates, and the resulting capacity-building process. Despite the mentioned circumstances, this process is ongoing and is being constantly monitored. This means that it is not yet possible to monitor the progress of projects in real time. However, in the case of the +Bosques project, semi-annual and annual progress reports are prepared with details of compliance with safeguards, which report on the application of the ENCCRV's MGAS, the +Bosques Environmental and Social Management Framework (ESMF)¹³¹, and the Environmental and Social Management Plan (ESMP) for the +Bosques project, as described below:

- In February 2025, an Annual Implementation Report (APR) was submitted to the Green Climate Fund (GCF) for the activities carried out in 2024. In addition to the progress made in terms of technical and budgetary execution, this report compiled a summary of all the activities and prevention/mitigation measures taken in compliance with both the MGAS of the ENCCRV and the ESMF of the +Bosques project.
- In July 2024, the mid-year report (MYR) was sent to the FAO. The purpose of this report is to provide the FAO with advance information on the progress of the +Bosques Project.

In general, these reports provide information on the socio-environmental context, training activities, and territorial implementation, presenting an analysis of safeguards that includes: a description of management measures, associated instruments, those responsible for implementation, effectiveness assessments, supporting documents for the verification of prevention and/or mitigation measures, conclusions, and lessons learned. This information

¹³⁰ The systems that make up this suite are: the Co-Benefits System, the Land Monitoring System, the Safeguards Information System, and the Forest Carbon System.

¹³¹ In accordance with specific project procedures established by the FVC and FAO, the +Bosques project developed its own Social and Environmental Management Framework (ESMF), which complements the role of the ENCCRV's MGAS. It is included as an annex to the "Funding Proposal," starting on page 128 at: <https://www.fao.org/3/ca6470es/ca6470es.pdf>

will be made available to auditors and the general public through the ENCCRV website (www.enccrv.cl) after obtaining the necessary authorizations from the agencies that financed the aforementioned projects.

Regarding GCF and FAO comments on 2024 APR, the main issues requested for further information were about GRM accessibility, environmental and social protocols, management strategy for safeguards lessons learned and participatory processes during project designs. All the requested information was delivered and no more questions emerged from the analysis.

During 2025, the same processes as described above continue to be applied.

2.3. Degree of implementation of the environmental and social measures established in the Safeguard Plans, quality of engagement with key stakeholders, and monitoring arrangements.

The application of the management tools presented in Table 4 as social and environmental mitigation/prevention measures aligned with the MGAS, will be maintained on an ongoing and effective basis, in accordance with the applicable national legal and regulatory framework for the 2024 reporting period.

However, it is important to note that with the entry into operation of the ENCCRV Benefit Distribution System at the end of 2022, the prevention measures originally presented in the MGAS underwent modifications and/or adaptations as part of the continuous improvement process and in order to respond to the new procedures for the implementation of territorial intervention projects. The main updates made are summarized below:

- Adaptation of the environmental and social feasibility assessment procedure: The Guideline for Social and Environmental Feasibility was incorporated to guide the evaluation process of applications for the ENCCRV public tender. This tool aims to improve the integration of safeguard concepts, in particular by providing more detail to facilitate the identification of potential critical risks that could have irreversible impacts by technical assistance professionals who carry out the desk and field evaluation of applications, thereby enabling them to declare these applications unfeasible and exclude them from the public tender. The Feasibility Assessment takes place during the application evaluation visit, which is carried out by the regional technical team to the person responsible for the application. For those initiatives submitted in which high-impact risks with a high probability of occurrence are identified, the person in charge of the evaluation proposes alternatives for modifying the project activities, which, once validated by the applicant, would imply a positive environmental and social Feasibility Assessment. If the applicant or holder does not validate the proposal, it must be declared unfeasible. This is without prejudice to reversible and/or low-impact impacts, for which appropriate prevention measures must be defined once the application has been awarded and the formulation stage has begun. These actions are key to making the human resources involved in technical assistance more efficient, since applying preliminary evaluation filters eliminates projects that are unfeasible from a safeguards perspective and thus focuses efforts only on awarded projects.

Among the key outcomes associated with the regional implementation of the ENCCRV through the SDB are a total of 821 intervention projects that have been completed or are currently underway by 2024, covering a cumulative area of approximately 11,439 hectares. These projects directly benefit more than 3,142 people (landowners and their families), of whom 50% (1,577) are women, 55% (1,746) are members of indigenous communities and 28% (866) are indigenous women.

In this regard, it is worth noting that 83% of these projects have been implemented on land belonging to small-scale forest landowners, 4% on public land (municipal properties, State-protected Wildlife Areas) and 13% on other types of property belonging to other stakeholders such as NGOs, farmers' associations and medium-sized landowners.

It should be noted that all territorial intervention projects awarded via public tender since 2022 have undergone an Environmental and Social Feasibility Assessment. Furthermore, for all of them, the respective EAS and PGAS were developed during the formulation stage.

Similarly, with regard to the implementation of the prevention/mitigation measure relating to the submission of ENCCRV projects to the Environmental Impact Assessment System (SEIA)¹³², it is worth noting that CONAF carried out a total of three relevance consultations linked to the ENCCRV, which were registered with the Environmental Assessment Service (SEA) in accordance with the classification set out in subparagraph 'p' of Article 10 of Law No. 19,300. All three relevance consultations requested from the Environmental Assessment Service have been approved, meaning that none of the three cases listed below required entry into the SEIA:

- +Bosques Araucanía Project: Ecological Restoration of the Cerro Nielol Natural Monument
- +Bosques Araucanía Project: Ecological Restoration and Enrichment with Native Species in Various Sectors of Villarrica National Park
- +Bosques Los Lagos Project: Access to Corcovado National Park, 2024 Hot Springs Trail (for which the approval resolution was issued in 2025).

With regard to the MGAS measures relating to public consultation and participation, it should be noted that, whilst the nature of the ENCCRV's territorial intervention projects did not require public consultations, given that, by their nature, they did not require the preparation of an EIA or DIA as established in Law No. 19.300 on General Environmental Principles or Indigenous Consultations as established in Supreme Decree No. 66 on the Regulations governing the Indigenous Consultation process pursuant to Article 6 of ILO Convention 169, it is noted that for the 821 territorial intervention projects under implementation during the reporting period, preventive measures were established aimed at taking into account and integrating the views of the beneficiaries regarding the activities, risks, potential impacts and measures, as well as the roles and responsibilities for the implementation and monitoring of the measures with their proposals (PGAS). In the case of indigenous communities, the requirements for Free, Prior and Informed Consent were applied across the board.

Evidence of these activities is documented in minutes of participatory processes, presentations for the public tender, visit reports, amongst others. Furthermore, the participatory processes were carried out with respect for the rights and cultures of indigenous and local communities and incorporating a gender-sensitive approach aimed at promoting the active participation of women. As a result, participatory design and planning enabled the development of a technical proposal validated by all key stakeholders.

Finally, for further information on the quality monitoring and supervision provisions established in the MGAS and implemented by CONAF during the reporting period, please refer to sections 2.2, 2.4, and 3.3.

2.4. The Complaints and Suggestions Mechanism (MRS) is operational.

¹³² Under Law No. 19,300 on General Environmental Principles, it serves as a preventive tool, ensuring that the assessment, identification, and implementation of prevention and mitigation measures are carried out correctly and in a cross-cutting manner across various areas, such as: physical cultural heritage, Indigenous peoples, sustainable forest management, critical natural habitats, chemical management, and citizen participation, among others.

During 2024, the ENCCRV's Complaints and Suggestions Mechanism (MRS) continued to operate within the Citizen Information and Assistance System (SIAC), via CONAF's Information, Complaints and Suggestions Offices (OIRS). It should be noted that this is the official channel established under national regulations, through which beneficiaries and the general public can submit their enquiries, grievances, suggestions, information requests, opinions, complaints or compliments. It is through this channel that the ENCCRV seeks to identify the risks and impacts that may be affecting these beneficiaries and/or third parties through the interventions of the ENCCRV and other programs carried out by CONAF, which are reported as part of the actions undertaken in the PRE area to contribute to the reduction of GHG emissions. It is worth noting that the OIRS form part of the SIAC as an official State system, which allows any interested person to access public service channels, always under the coordination and oversight of the General Secretariat of the Government (SEGEJOB), with multiple access points or communication channels available for use. Figure 4 shows the SIAC's citizen service channels, of which the OIRS form part.



Figure 4. SIAC Customer Service Channels. **Source:** CONAF, 2018

For cases received during the reporting period, from 1 January to 31 December 2024, CONAF has provided responses and carried out the necessary follow-up through its internal systems, which form part of the SIAC, both in the prescribed manner and within the established timeframes, in accordance with Law No. 20.880 on Administrative Integrity, which regulates transparency in the public service and the right of access to information held by State administrative bodies. It should be noted that Law No. 20.880 establishes response times, administrative procedures with detailed traceability, and the specific responsibilities of officials who, by virtue of their position or duties, must provide the information requested by users.

In addition to this legal framework, the “Regional Agreement on Access to Information, Public Participation and Access to Justice in Environmental Matters in Latin America and the Caribbean”, known as the Escazú Agreement, an international treaty whose main objective is to ensure the full and effective implementation of the rights of access to environmental information, public participation in environmental decision-making processes, and access to justice in environmental matters. Operationally, the Office of Agricultural Studies and Policies (ODEPA) serve as MINAGRI’s focal point for compliance with this Agreement, with the Citizen Participation and Transparency Unit representing and reporting on the actions undertaken by CONAF to intra-ministerial bodies. At the national level, the implementation of the Agreement is led by the Ministry of the Environment, which, through MINAGRI, requested that each of its subordinate departments report on the actions being implemented or planned to comply with the

strategic lines of the Participatory Implementation Plan for the Escazú Agreement¹³³, which would contribute to fulfilling people’s right to access to information, participation and justice in environmental matters. For actions relevant to the ENCCRV, at CONAF level the report was led by the DCCSE (with support from the Citizen Participation and Transparency Unit for reporting purposes), thereby becoming an element that strengthens the ENCCRV’s MRS, which is constituted by the SIAC.

The following section presents the requests submitted to CONAF’s OIRS for the 2024 period that relate to or are relevant to the activities of the ENCCRV and the ERPA, which are currently being implemented in six of the country’s sixteen regions, namely from the Maule Region to the Los Lagos Region, both inclusive.

For this analysis, all information entered into the SIAC in the regions covered by the ERPA was used, whether these were enquiries, grievances, suggestions, information requests, opinions, complaints or compliments, in line with the approach taken in the 2018–2019 retrospective report. The two input themes used to classify the above, as input variables relevant to the ENCCRV, were Climate Change and Indigenous Affairs. The latter was included to ensure the comprehensiveness of the cases analyzed, as the safeguards and internal national regulations applicable to indigenous peoples are of particular interest to the Strategy.

Table 5 provides a breakdown of the applications received that had Climate Change and Indigenous Affairs as input variables, organized by region and gender.

Type of submission	Ñuble		Biobío		La Araucanía		Los Ríos		Los Lagos		Central Office		TOTAL
	F	M	F	M	F	M	F	M	F	M	F	M	
Enquire		1	1		1		1		1	3	8	10	26
Grievance	-	-	-	-	-	-	-	-	-	-	-	-	-
Information request				2	2			1			2	1	8
Complaint					1						1		2
Suggestion								1					1
Opinion	-	-	-	-	-	-	-	-	-	-	-	-	-
Compliments	-	-	-	-	-	-	-	-	-	-	-	-	-
Total by gender	0	1	1	2	4	0	1	2	1	3	11	11	37
Total General	1		3		4		3		4		22		37

Table 5. Submissions received during the reporting period, from January first to December 31 st. 2024. **Source:** OIRS report from CONAF, 2024.

As shown in the table, during 2024, a total of 37 submissions relating to categories “Climate Change and “Indigenous Affairs” were received by the OIRS; of these, 49% were made by women, whilst 51% were made by men. Furthermore, of the total number of submissions, 30% were made by members of an indigenous community. The preferred method for submitting requests was online (62%), followed by telephone (27%), email (8%), and in person (3%).

¹³³ Available at: <https://mma.gob.cl/wp-content/uploads/2024/04/Plan-Nacional-de-implementacion-participativa-del-Acuerdo-de-Escazu-Chile-2024-2030.pdf>

With regard to the types of submissions, the vast majority were queries (70.3%), followed by information requests (21.6%) and suggestions (2.7%), whilst two complaints were made, accounting for 5.4% of the total.

For the reporting period, the most common topics related to requests for information on Protected Wildlife Areas (37.8%), followed by requests for “technical advice” not related to the implementation of the ENCCRV (16.2%), and “other topics” (16.2%). To a lesser extent were requests relating to “Information on the ENCCRV” at 8.1%, “Carbon Credits” at 8.1% and “Fire prevention”, also at 8.1% of the total requests. The detailed list is shown below.

- Information requirements about ENCCRV and access to it’s benefits (3)
- Information on Protected Wilderness Areas (14)
- Carbon credits (3)
- Environment, education and climate change (2)
- Fire prevention (3)
- Technical advice (6)
- Other issues (6)

It is important to note that neither of the two complaints received during the period was directly related to the development of the ENCCRV. Specifically, one related to “Fire prevention”, requesting the updating and activation of the CONAF webpage to visualize fire risk maps for a specific locality; in this regard, a response was provided by the Forest Fire Protection Department, offering explanations regarding the webpage update and attaching information on the Forest Fire Protection Plan for the requested locality. The second was categorised under “Other issues” and related to the Afforestation Program, in which a complaint was made regarding the lack of timely information on plant deliveries and stock levels. In response, the relevant departments at CONAF provided a reply, stating that the provision of timely information would be improved, and that whilst the shortage of plants was due to high demand, this would be taken into account to optimise service for future deliveries.

Finally, it should be noted that all requests submitted to the MRS during the 2024 period, were processed and responded to within a 10-day timeframe, in accordance with Law No. 19,880, which guarantees the right of access to information and timely service.

3. The objectives and expected outcomes in the Safeguards Plans have been achieved.

3.1 Overall effectiveness of the management and mitigation measures established in the Safeguard Plans.

It should be noted that both the prevention and mitigation measures set out in the MGAS and those outlined in Table 4, concerning institutional management tools, are aligned with the national legal and regulatory framework, which is described in Chapter 3 of the MGAS. This makes it possible to link their functionality to one or more OP/BMs, whilst also enabling an assessment of their effectiveness by describing the extent to which they contributed to compliance with each OP/BM.

Furthermore, regarding the occurrence of impacts and the resulting mitigation measures to determine overall effectiveness, it is noted that for each activity implemented in 2024, the same methodology as in previous periods was applied. This means that, based on the judgement of the regional managers and safeguards counterparts from each of the four technical departments, it was verified through analysis whether the impacts from the previous period (2023) persisted or whether new ones were identified, whilst also indicating which corrective or mitigation actions were implemented; the information was recorded in digital survey-style spreadsheets, constructed on the basis of data compiled from the two previously reported periods, plus those risks and impacts described in the

ENCCRV's SESA, to be subsequently supplemented and validated through interviews or working meetings with the safeguards counterparts designated by each technical department. With regard to overall effectiveness based on the analysis described, it was concluded that the anticipated impacts and risks were adequately prevented, in accordance with the provisions of the MGAS and the World Bank's Operational Policies, including activities funded from the national budget and with international financing.

The results of the analysis of the risks anticipated by the SESA and assessed for the reporting period are explained in section 4.1 of this report.

3.2. Are quality assurance, monitoring, and supervision provisions effective in identifying and correcting defects where emissions reduction program activities have not been implemented in accordance with the Safeguard Plans?

The quality assurance, monitoring and oversight schemes established in the MGAS and implemented by CONAF during the reporting period include follow-up reports from the Institutional Management Information System (SIGI), compliance reports on the Social and Environmental Management Plans (PGAS), visit reports and minutes of participatory field processes, cross-cutting training, monthly monitoring with regional teams, and continuous monitoring of all requests submitted via the ENCCRV's MRS.

The implementation of these monitoring and supervision measures was carried out by the central team, including the staff advising the GBCC, through CONAF's management control using SIGI indicators and with the support of professionals from the regions involved. In this regard, it can be confirmed that these arrangements were effective in identifying and correcting deviations linked to the implementation of MGAS measures and other institutional management instruments during the implementation of the PRE's emission reduction activities.

With regard to monitoring via the SIS and as explained in section 2.2, it is expected that the majority of projects will be uploaded to the System by 2025. In 2023, institutional instructions¹³⁴ were issued setting specific deadlines for the progress of project uploads during 2024. Throughout 2024, regular monitoring of regional teams was carried out, and significant progress has been observed regarding the cross-cutting use of the systems. This aspect is being addressed in accordance with the corrective actions described in section 5.2.

3.3 Description of the general monitoring provisions to ensure the implementation of the Safeguard Plans, as well as subsequent environmental and social documents prepared during the implementation of the program and their effectiveness.

With regard to the general and monitoring provisions designed to ensure the implementation of the MGAS and all its management tools, two key aspects stand out: firstly, the continuous monitoring and supervision carried out by the Environmental and Social Safeguards Team, which resulted in the biannual review of the OIRS results, the implementation of virtual and on-the-ground support activities for regional teams, enabling the holding of 47 safeguards meetings and 6 site visits (details in Table 6.). Also, 17 capacity-building meetings on the use of the Safeguards Information System, were conducted during 2024. This enabled the collection of verification documents such as meeting minutes, on ground visit records, records of participatory processes, attendance lists, checklists and safeguard visit reports, amongst others.

¹³⁴ MEMORÁNDUM No 6821/2023 y MEMORÁNDUM No 1425/2023

Region	Site visits	No. of Regional Meetings
Maule	1	8
Ñuble	1	6
Biobío	1	10
Araucanía	1	6
Los Ríos	1	9
Los Lagos	1	8
Total	6	47

Table 6. Safeguard support actions for regional teams (2024).

At the second level, the highlight is on the monitoring, evaluation and recording of safeguard management carried out by regional teams, either directly in the case of activities carried out by CONAF professionals, or indirectly in the case of activities carried out by contractors or subcontractors, through the respective project's Environmental and Social Management Plan (PGAS) and on-site monitoring visits, as well as reviews of compliance with labor regulations carried out by the risk prevention expert in accordance with the provisions of the MGAS.

To reinforce the monitoring and oversight of safeguards, activities have been carried out that address procedural aspects in detail to contribute to continuous improvement. It is worth noting that 2024 has enabled the incorporation of new lessons learnt regarding the standardization of due diligence procedures following the identification of incidents that could potentially have an unforeseen impact. This complements the procedures for workplace accidents involving third-party contractors and the protocol for reporting workplace accidents occurring within the framework of the ENCCRV programs. Furthermore, the identification of potential unforeseen incidents is required, such as breaches of forestry legislation and conflict resolution in community projects. To this end, the +Bosques project team is developing an incident management protocol, which covers timely communication and decision-making for recording, implementing mitigation measures and reporting, and which will come into use in 2025.

Furthermore, in 2024, a risk prevention expert joined the ENCCRV's +Bosques Project, carrying out documentary and field monitoring, focusing on health, safety and social risks in forestry operations tendered under activities implemented through the SDB.

The appointment of this professional has helped to improve the quality of contracts with forestry operators, particularly in terms of labor regulation compliance.

4 Program activities present emerging environmental and social risks and impacts not identified or anticipated in the Safeguard Plans prepared prior to ERPA signature.

4.1. Current relevance of the scope of potential risks and impacts identified during the Strategic Environmental and Social Assessment (SESA) for the activities of the Emissions Reduction Program.

As in previous reports, the potential risks and impacts identified in the SESA continue to form the basis for the analysis of occurrences during the period covered by this report up to December 2024; however, it should be noted that the experience gained through the implementation of projects during the RBP7 phase has led to continuous improvement in CONAF's safeguards management, both at central level and within regional teams.

This experience has a direct influence on the effective prevention of impacts and is achieved through the application of safeguard management procedures, instruments and tools derived from the MGAS, which remained fully in force

in 2024 and were reinforced through regular capacity-building initiatives such as meetings and workshops, such as the dissemination of the “Guidelines for the Participation of Local and Indigenous Communities in ENCCRV Projects” and the “Plan for Sustainability and Strengthening of Conditions Conducive to the Continuity of the ENCCRV”.

In summary, during the reporting period, it was possible to reduce risks, and thereby the likelihood of socio-environmental impacts, through the institutionalization of safeguards, which included the implementation of SESA mitigation measures, the application and/or updating of MGAS instruments, continuous monitoring of the activities and/or actions implemented, and the strengthening of the management capacity of regional teams.

Furthermore, it can be stated that the risks and impacts identified in the SESA remain relevant because they were anticipated in a strategic assessment process. By 2025, the Environmental and Social Assessment (ESA) of the PRE is expected to be prepared in accordance with the technical considerations and guidelines set out in the 2nd edition of the MGAS, which is currently under development and is due to be published in 2025.

4.2 Activities of the emissions reduction program that have presented risks or impacts not previously identified in safeguard plans developed before the signing of the ERPA, together with proposed actions for their management.

According to the data for the 2024 reporting period on the activities carried out by CONAF through the various institutional management tools implemented by the technical departments and forming part of the Corporation’s regular operations, in the PRE area, the analysis shows that no new risks or additional impacts arose during the reporting period; furthermore, it can be inferred from the same analysis that both the OP/BM and the other safeguards in place for the ENCCRV have been respected.

Meanwhile, regarding interventions funded by international sources such as the Green Climate Fund, only one unforeseen environmental impact was recorded in 2024, arising from activities carried out in the Los Lagos region. This impact arose from work carried out by a third party, a forestry contractor, who installed a fence to which an anti-fungal preservative was applied, unexpectedly attracting bees from the project beneficiary, which led to a reduction in honey quality, prompting the owner to discard hive boxes and replace frames in some of their other hives. Additionally, as part of the mitigation measures, the +Bosques project implemented protocols that included the immediate cessation of the product’s application across all project activities, and financial compensation agreed with the beneficiary, which has already been paid by the FAO. The impact did not constitute a breach of national legislation and, given the unforeseeable nature of the situation – there are no reports of similar impacts from the use of the product in other interventions promoted by the ENCCRV – the incident does not pose significant risks to the implementation of the Strategy’s actions in the PRE area. It should be noted that the mitigation measures were adequately documented and all relevant verifiers are in place; these form part of the reports and monitoring carried out by the Regional Teams, which, in addition to implementing projects with external funds, are responsible for the operational monitoring of safeguards in the area covered by the PRE.

Finally, based on the analysis arising from the reviews conducted by the ENCCRV Environmental and Social Safeguards Team with the four professionals appointed by each technical management unit to assess compliance with safeguards within the framework of CONAF’s regular operations during 2024 in the PRE area, and although this does not relate to the generation of new impacts, a specific aspect that had not been considered in the original assessment of potential risks was discussed with the Forest Fire Protection Department regarding the development of Community Forest Fire Prevention Plans. Specifically, the potential risk relates to the fact that during the implementation phase of these plans, the clearing and reduction of plant fuel carried out by members of each community could expose them to a certain degree of accident risk and/or generate socio-environmental impacts. To address this, a commitment was made to continue CONAF’s support through training, since although these activities do not receive state funding and the work is not carried out in areas classified as forest or native woodland, and therefore do not require authorization from CONAF, it is equally important to ensure that such activities are

carried out with a focus on safety and respect for social and environmental safeguards, avoiding, for example, the contamination of watercourses.

5. Corrective actions and improvements needed to enhance the effectiveness of the Safeguards Plans.

5.1. Evaluation of the general implementation of safeguard plans (MGAS)

As noted in previous reports, it is essential to bear in mind that CONAF operates on the principle of continuous improvement through capacity building, process updates and institutional reforms, amongst other measures, with the aim of facilitating the implementation of the measures set out in the MGAS. This should be understood as a progressive process, that is complementary to national legislation, aimed at establishing this document within the institution as a management tool for the prevention of socio-environmental risks and impacts that could arise from the implementation of activities linked to emissions reduction in the PRE area.

In line with the above, for all activities implemented under the ENCCRV's MDA during 2024 across the six ERPA regions, both the guidelines set out in the MGAS and the guidelines of the +Bosques Project, the Green Climate Fund and the FAO were applied. Specifically, the Environmental and Social Feasibility Assessment process was applied as part of a critical risk analysis during the application stage for activities to the SDB, as well as to verify compliance with exclusion criteria during the evaluation process of the proposed initiatives. In addition, the corresponding Environmental and Social Assessments were carried out to formulate the Environmental and Social Management Plans, which identified the risks, prevention measures and means of verification relevant to the specific context of each initiative on its land. Furthermore, monitoring and compliance with prevention measures was carried out by the regional teams, who have received ongoing training on the guidelines issued by the MGAS. In turn, the central team monitored regional activities on a monthly basis and carried out random compliance checks. This randomised process was designed using qualitative assessment rubric, which was implemented in the second half of 2024 with a sample of two projects per region. Furthermore, a consultation was carried out regarding the relevance of submitting an application to the SEIA for an initiative to be developed in Protected Areas, resulting in the decision that the project is not required to undergo the SEIA process¹³⁵.

Regarding the gaps identified between national legislation and the OP/BM as indicated in Chapter 3 of the MGAS, it is worth noting that from its publication in 2018 until 2024, and as a result of the experience gained in implementing the +Bosques project, it has been possible to explore in greater depth the relevance and application of protocols and instruments to address these gaps in a manner appropriate and relevant to the RBP phase of the ENCCRV. For its part, the MGAS is currently being updated and will be published during the first half of 2025. This new version takes into account the lessons learnt from the RBP phase and necessary adaptations in relation to the legislative amendments and institutional arrangements currently underway, as well as the local realities observed in the implementation of forestry operations. It will also incorporate the National Safeguards Approach (ENS), which, through 12 cross-cutting themes defining national-level safeguards objectives, addresses environmental and social issues in an inclusive manner, incorporating the safeguards standards of the Cancún Safeguards, the World Bank, UN-REDD+ Guidelines, the Green Climate Fund, UNDP, FAO, ART Trees and the Sustainable Development Goals.

¹³⁵CONAF Exempt Resolution No. 2024 Regarding Access to Corcovado National Park's Hot Springs Trail, Los Lagos Region; ID: PERTI 2024-18554

Generally speaking, as noted in Chapter 3 of the updated MGAS, the international safeguard standards and requirements applicable to the ENCCRV—as well as international conventions—are met through the application of Chile’s current legal and regulatory framework, including the international agreements signed by the country. However, to adequately address the identified gaps, it is essential to have specific procedures and guidelines, such as the definition of activities excluded from the ENCCRV, clear criteria for environmental and social analysis, mechanisms for stakeholder participation, the Complaints and Suggestions Mechanism, and the mainstreaming of a gender perspective, among others.

In conclusion, having updated the analysis of compatibility between the objectives of the 12 national safeguard cross-cutting themes, and international safeguard standards and/or requirements, and the six specific gaps identified (see Figure 7), CONAF has established the priorities and/or necessary efforts to address these and ensure special attention is paid to them during the implementation of the ENCCRV. Furthermore, as new gaps or inconsistencies are identified between national regulations that affect compliance with safeguards, each case must be examined in order to propose and implement the corresponding adjustments, always in accordance with current national regulations. Figure 7 presents a summary of the gap analysis carried out as part of the update to the MGAS, to be published in 2025.

Gaps and/or legal loopholes in the implementation of safeguards Actions to address opportunities and/or gaps

G1	There is a difference between the levels of participation by local and indigenous communities required for activities under the RBP Phase of the ENCCRV and the requirements established under the current legal framework.	• Institutional consolidation of intercultural models (MAIA and MOFIM). • In the SDB: an indigenous peoples variable designed to support projects led by indigenous individuals and/or communities, and the inclusion of indigenous representatives in the system's governance. • Specific procedure in section 5.2 of the MGAS.
G2	Chilean law does not provide for a specific protocol for mainstreaming a gender perspective in climate change mitigation or adaptation measures related to vegetation resources.	• In the SDB: a gender variable as a positive action measure to benefit projects led by women or with significant female participation; application of criteria that allow women to serve as project leaders, thereby enabling them to access resources and benefits without needing to own land. • Creation of CONAF's Gender Equality and Diversity Unit. • Specific procedure outlined in Section 5.2 of the MGAS.
G3	National legislation includes provisions for the management of tangible cultural heritage; however, the scope of this priority area is broader, as it incorporates intangible cultural heritage and also takes into account cultural heritage elements at the local level.	• Appendix No. 6 of the MGAS: Procedural Guidelines for Tangible Cultural Heritage.
G4	Limitations of the regulatory framework governing the environmental and social assessment of forestry projects to be implemented in significant natural habitats under the ENCCRV.	• List of Excluded Activities. • Sections 5.2 and 5.3 of the MGAS, including the precautionary principle that restricts the implementation of projects involving the conversion or degradation of natural habitats (classified as high socio-environmental risk or "Category A") and the EAS - PGAS. • Annexes No. 2 and No. 3 of the MGAS.
G5	The pesticides authorized, revoked, restricted, and banned by the SAG in the exercise of its authority may differ from the lists of restricted pesticides established in accordance with the recommendations of the World Health Organization (WHO).	• List of Excluded Activities. • Section 5.3 of the MGAS. • Annex No. 4 of the MGAS: Protocol on Pest and Disease Control.
G6	Chilean law does not provide for a protocol for community participation in the planning and implementation of resettlement, nor does it establish forms of compensation that align with the criteria and/or requirements of international safeguard standards.	• List of Excluded Activities. • Guidance Document for Determining the "Scope" of Involuntary Resettlement, Annex No. 7: Resettlement Policy Framework and Procedural Guidelines, Beneficiary Agreement, and CONAF. • Complaints and Suggestions Mechanism (MRS) of the ENCCRV OIRS CONAF.

Figure 7. Summary for the reporting period of the gap analysis between national legislation and the OP/BM, aligned with the MGAS, which is currently being updated. Source: Compiled by the authors for the Preliminary Version of the MGAS 2025.

5.2. Corrective actions, areas for improvement, and preliminary programming

To clarify, in line with the principle of continuous improvement, the actions described below are primarily improvements, which are expected to be addressed in 2025:

- **Updating the MGAS:** Taking into account the progress of the ENCCRV in its results-based payment phase, the new national circumstances and their impact on previously identified gaps, the assessment carried out based on the survey administered to regional teams, and the absence of a continuous improvement and adaptive management approach that establishes a frequency for reviewing or updating the instrument, the importance of having an integrated approach to safeguards (including a gender perspective) as a framework

for application to current project types, and of adapting safeguard management and compliance procedures in accordance with the SDB, an update of the instrument is currently being carried out and is scheduled to be published during the first half of 2025 for public consultation.

- Monitoring the implementation of the Safeguards Information System (SIS): Given that in 2024 a major update was carried out regarding risks, prevention measures and verification methods available in the system, adapted to the needs of the RBP phase, the main objective for progress regarding the SIS for 2025 is the bulk uploading of projects in order to obtain indicators of respect and compliance with safeguards. To this end, a training cycle regarding the system update was launched in 2024 for all regional teams, a practice that will continue throughout 2025. Regarding safeguard indicators, the central team is currently in the process of reviewing and updating indicators, which will improve the SIS's reporting functions.
- Strengthening of safeguards institutional management: Whilst there has been significant progress in the process of institutionalizing safeguards, there remains an opportunity to consolidate a technical framework that allows the safeguards approach to be integrated into institutional work in an efficient and strategic manner; to this end, it is envisaged to continue actions in the following areas:
 - Within the framework of potential actions to advance compliance with the Nationally Determined Contribution (NDC) targets for the Land Use, Land Use Change and Forestry (LULUCF) to be analyzed by the DCCSE, and considering that institutional activities implemented with national funds that are not channelled through the ENCCRV's SDB and are governed exclusively by current environmental, forestry and labour legislation, a section on minimum technical guidelines for addressing safeguards in this area has been incorporated into the MGAS.
 - With regard to the institutional management indicator "SIGI GBCC17", led by the DCCSE and of a sub-national nature (applicable only to the six PRE regions), the aim is for 30% of projects awarded to small-scale forest owners (individual and collective) under the ENCCRV's RBP Phase to have a gender-sensitive implementation framework that ensures the effective participation of women. To this end, during 2024, the indicator was updated taking into account the lessons learnt from its application in 2023, focusing mainly on standardizing the application of the tool, as well as ensuring that teams were adequately trained for its implementation, and it is planned to continue monitoring and verifying its implementation in 2025.
- Continuity of activities on safeguard monitoring and follow-up: As a key aspect of safeguard management and in line with the provisions of the MGAS, it is necessary to ensure the continuity of monitoring and follow-up activities, as summarized below:
 - a. Continue with the implementation of the field support plan by the Environmental and Social Safeguards Team, with the aim of supporting the development of processes and the application of safeguards instruments in accordance with the MGAS guidelines and the needs and/or requirements of the regional teams, particularly in activities such as the development and publication of successful project cases from the perspective of safeguards management, REDD+ Group sessions, participatory processes, Environmental and Social Feasibility Assessment in the SDB Public Tender, and workshops on leadership and sustainable livelihoods, amongst others.
 - b. Continue to hold monthly virtual safeguards meetings with regional teams, with the aim of providing appropriate technical support as well as delivering guidelines, recommendations and information regarding safeguards management, based on reports, indicators and findings related

to safeguards management resulting from progress in the implementation of territorial projects, amongst others.

- c. Safeguards Exchange Workshops: virtual and in-person activities with regional teams to promote the exchange of experiences and challenges in safeguards management, identifying opportunities for improvement in the areas of ENCCRV implementation.
- Strengthening the identification and quantification of the non-carbon benefits of the ENCCRV's action measures: Progress in this area is set out in Annex 3 of the Emissions Reductions Monitoring Report (ERMR) for Milestone 3 of the ERPA.
- Implementation of the Sustainability Plan and Strengthening of Conditions Conducive to the Continuity of the ENCCRV¹³⁶: Under this plan, it is envisaged that an Opportunity Cost consultancy will be implemented by 2025, with the aim of identifying potential for improving the distribution of benefits under the Strategy, as well as another consultancy that will enable participatory monitoring pilots to be carried out, involving the beneficiary population in the sustainability of the interventions. Likewise, it is planned to carry out the participatory monitoring consultancy, which aims to develop pilot projects for Participatory Monitoring with beneficiaries of the ENCCRV's +Bosques Project.

5.3 Preliminary programming to carry out the corrective actions and improvements identified above.

In line with the actions described in Section 5.2, a preliminary schedule has been defined to guide the implementation of corrective actions and improvement measures during 2025. This programming is indicative and may be adjusted in accordance with operational needs and the principle of adaptive management.

First semester of 2025:

- Finalization and publication for the participatory process of the updated MGAS, incorporating an integrated safeguards approach, including gender considerations and adaptations to the SDB.
- Continuation of field support activities by the Environmental and Social Safeguards Team, prioritizing key processes such as Environmental and Social Feasibility Assessments and participatory processes.

Second semester of 2025:

- Bulk uploading of projects into the SIS to enable the generation of safeguards compliance indicators.
- Monitoring and verification of the implementation of the gender-sensitive indicator (SIGI GCEBX17), including follow-up with regional teams.
- Implementation of Safeguards Exchange Workshops (virtual and in-person) to identify lessons learned and improvement opportunities.
- Progress in consultancies under the Sustainability Plan, including the Opportunity Cost study and the design and initial implementation of participatory monitoring pilots.
- Continued strengthening of the identification and quantification of non-carbon benefits, in coordination with the ERMR process.

¹³⁶In 2024, the Plan for Sustainability and Strengthening of Conditions Conducive to the Continuity of the ENCCRV was approved, which aims to improve the institutional capacities and those of beneficiaries to promote the sustainability and scaling up of ENCCRV's actions implemented in the territories, and to ensure the permanence and prevent the deterioration of the interventions carried out by ENCCRV in the territories.

Throughout 2025:

- Continuation of the training cycle for regional teams on the updated Safeguards Information System (SIS), including practical guidance for project registration and use of updated indicators.
- Continuous monitoring and follow-up of safeguards implementation in line with MGAS provisions.
- Ongoing technical support to regional teams through field visits, workshops, and remote assistance.
- Iterative improvement of safeguards management tools and procedures based on lessons learned and emerging risks.
- Ongoing review and adjustment of safeguards indicators by the central team to strengthen SIS reporting functions.
- Implementation of monthly virtual safeguards meetings with regional teams, ensuring continuous technical support and feedback mechanisms.

This preliminary program aims to ensure a structured and coordinated implementation of safeguards-related actions, while maintaining flexibility to incorporate feedback, lessons learned, and evolving institutional and territorial conditions.

ANNEX 2: INFORMATION ON THE IMPLEMENTATION OF THE BENEFIT-SHARING PLAN

This annex was replaced by the BSP implementation status report which was recently submitted to the World Bank in August of this year.

ANNEX 5: DETAILED DESCRIPTION OF THE APPLICATION OF THE REVERSAL RISK ASSESSMENT TOOL

The country decided not to use this methodology and to continue with the application of qualitative reversal risk assessment.

ANNEX A: QUANTIFICATION AND MONITORING OF DEFORESTED AREAS AFFECTED BY BROWNING

The browning phenomenon in Chile, caused by the megadrought, has been impacting Mediterranean and temperate forests, resulting in significant reductions in forest productivity. This effect is primarily due to decreased precipitation and water availability, resulting in phenological anomalies such as crown desiccation, foliage loss, and even tree mortality.

In 2022, a study conducted by Universidad Católica identified these areas, specifically focusing on the 5th percentile productivity anomaly, to map the impact of browning. This map was used to segregate affected areas within the ERP implementation zone, covering native forests between Maule and La Araucanía (Mediterranean sclerophyllous forest extension), as well as extended areas of the RORACO forest type resulting in the extension of the browning affected area from Maule to Los Ríos. The emissions resulting from browning areas are segregated from the carbon flux calculations associated with deforestation, degradation, and conservation activities. Nevertheless, the forest stratum affected by browning remains included within the scope of ERP implementation and monitoring area. This annex provides a transparent quantification of deforested areas affected by browning, utilizing the identified phenological anomaly layer for segregation.

To carry out this monitoring, the following layers were used:

-Deforestacion_24_PRE.shp¹³⁷: the union of all deforested polygons from the period 2024 and comes from the land-use land use change maps.

- G_MOV_PRE_2022_2023.tif¹³⁸: The raster layer of carbon flux monitoring in forest remaining forest from the 2022-2023 period. This raster contains information about the phenological anomalies layer created by the study conducted by Universidad Católica.

The first step to realize this quantification was to polygonise the 2022-2023 carbon flux layer (G_MOV_PRE_2022_2023.tif). Then, this layer was clipped using the boundaries of the deforested areas from the 2024 period (Deforestacion_24_PRE.shp).

The result of this step is a shapefile of deforested areas of the permanent forest, which contains the attribute table information from the G_MOV_PRE_2022_2023 layer. The main column of interest is the browning impact. Using this field, a filter was applied to select the areas affected by browning. After that, an intersection was made between the information from the browning affected areas and the Deforestacion_24_PRE.shp layer. Finally, the layer def_mh_brown_polig_RP4.gdb.zip¹³⁹ was obtained, which contains information to quantify the deforested areas affected by browning, which was uploaded to the ERPA database on CONAF servers.

A table named deforestacion_bw was also created in the database, in which queries were performed to quantify the areas by forest type and structure. This information was used in the tool created called "Herramienta_Deforestacion_BW_NR2_MR4_v03"¹⁴⁰. The results of calculation are broken down below:

¹³⁷¹³⁷ Link: https://plataforma.encrv.cl/static/erpa/mr4/monitoreo-browning/Deforestacion_24_PRE.zip

¹³⁸ Link: <https://plataforma.encrv.cl/static/erpa/mr3/mapas/CO2-MR3.zip>

¹³⁹ Link: https://plataforma.encrv.cl/static/erpa/mr4/monitoreo-browning/def_mh_brown_polig_RP4.gdb.zip

¹⁴⁰ Link: https://plataforma.encrv.cl/static/erpa/mr4/monitoreo-browning/Herramienta_Deforestacion_BW_NR2_MR4_v03.xlsx

Emission from deforestation in areas affected by browning-Monitoring period 2024				
Region	Deforested area (ha)	Biomass (tCO ₂ e año-1)	Necromass (tCO ₂ e año-1)	Total (tCO ₂ e año-1)
Maule	23	2,298	2,565	4,863
Ñuble	15	2,544	1,985	4,529
Biobío	11	1,602	1,788	3,390
Araucanía	27	8,291	5,381	13,672
Los Ríos	35	10,774	6,863	17,637
Los Lagos	0	0	0	0
Total Area PRE	112	25,508	18,583	44,091

Table 1. Emission from deforestation in areas affected by browning- Monitoring period 2024

