



AVOIDING PLANNED DEFORESTATION AND DEGRADATION IN THE VALDIVIAN COASTAL RESERVE, CHILE



Project title	Avoiding Planned Deforestation and Degradation in the Valdivian Coastal Reserve, Chile
Project ID	1175
Monitoring period	04-November-2014 to 03-November-2023
Original date of issue	03-March-2025
Most recent date of issue	27-November-2024
Version	3.0
VCS Standard Version	4.7
Prepared by	TerraCarbon LLC

CONTENTS

PROJECT DETAILS	4
1.1 Summary Description of the Implementation Status of the Project	4
1.2 Audit History.....	4
1.3 Sectoral Scope and Project Type	5
1.4 Project Proponent	5
1.5 Other Entities Involved in the Project	5
1.6 Project Start Date	6
1.7 Project Crediting Period	6
1.8 Project Location	6
1.9 Title and Reference of Methodology	9
1.10 Double Counting and Participation under Other GHG Programs	10
1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions.....	10
1.12 Sustainable Development Contributions	11
1.13 Commercially Sensitive Information.....	14
2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT	14
2.1 Stakeholder Engagement and Consultation.....	14
2.2 Risks to Stakeholders and the Environment.....	19
2.3 Respect for Human Rights and Equity	23
2.4 Ecosystem Health	30
3 IMPLEMENTATION STATUS	33
3.1 Implementation Status of the Project Activity	33
3.2 Deviations	33
3.3 Grouped Projects	34
3.4 Baseline Reassessment.....	34
4 DATA AND PARAMETERS.....	34
4.1 Data and Parameters Available at Validation	34
4.2 Data and Parameters Monitored.....	35
4.3 Monitoring Plan.....	52
5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	58
5.1 Baseline Emissions	58

5.2	Project Emissions	59
5.3	Leakage Emissions	65
5.4	GHG Emission Reductions and Carbon Dioxide Removals	71
APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION.....		75

PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

Over the monitoring period from November 2014 to November 2023, The Nature Conservancy continued forest protection and community outreach and education activities, and updated the management plan for the Valdivian Coastal Reserve for the period of 2021 to 2026. During the monitoring period, no new deforestation, degradation or natural disturbances took place in the project area, confirmed through classification of Landsat imagery and from close surveillance of the reserve by park guards and CONAF. Total GHG emission reductions or removals generated in this monitoring period were –18,962 t CO₂e, resulting from delayed leakage effects due to Eucalyptus production averted.

Table 1.1. Schedule of project activities

Project activity	Date	Source/Notes
Project start date and start of the crediting period	4 November 2003	Date of acquisition of the VCR property by TNC
VCR forest inventory	2011	
Registration of the project	22 March 2013	
Validation and first verification of the project	06 April 2014	
Second verification of the project	25 November 2015	-
End date of project crediting period	3 November 2023	
Third verification of the project	03 March 2025	

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation/verification	04-Nov-2003 -- 03-Nov-2011	VCS	Environmental Services, Inc. (ESI)	10 years

Verification	04-Nov-2011 – 03-Nov-2014	VCS	The Rainforest Alliance	3 years
Verification	04-Nov-2014 – 03-Nov-2023	VCS	AENOR	9 years

1.3 Sectoral Scope and Project Type

Sectoral scope	Agriculture, Forest, and other Land Use (AFOLU)
AFOLU project category ¹	Reduced Emissions from Deforestation and Degradation (REDD)
Project activity type	Avoided Planned Deforestation (APD)

1.4 Project Proponent

Organization name	The Nature Conservancy
Contact person	Liliana Pezoa
Title	Administrator, Valdivian Coastal Reserve
Address	Errázuriz 999, Valdivia, Los Ríos, Chile
Telephone	+56 9 56468202
Email	lpezoa@tnc.org

1.5 Other Entities Involved in the Project

Organization name	TerraCarbon LLC
Role in the project	Technical consultants
Contact person	David Shoch
Title	Director

¹ See Appendix 1 of the VCS Standard

Address	1822 W. Willow Wood Dr., Peoria, IL, 61614
Telephone	1-309-693-9303
Email	david.shoch@terracarbon.com

1.6 Project Start Date

Project start date	☐ 04-November-2003
Justification	The date The Nature Conservancy acquired the Valdivian Coastal Reserve property, which encompasses the project area.

1.7 Project Crediting Period

Crediting period	☒ Other: 20 years (complies with Crediting Period requirements found in VCS Standard v4.7, Section 3.9.3).
Start and end date of first or fixed crediting period	04-November-2003 to 03-November-2023

1.8 Project Location

The project area of 1,273 ha is located within the larger VCR property (Figures 1.1 and 1.2), in Region XIV, Chile, south of the city of Valdivia.

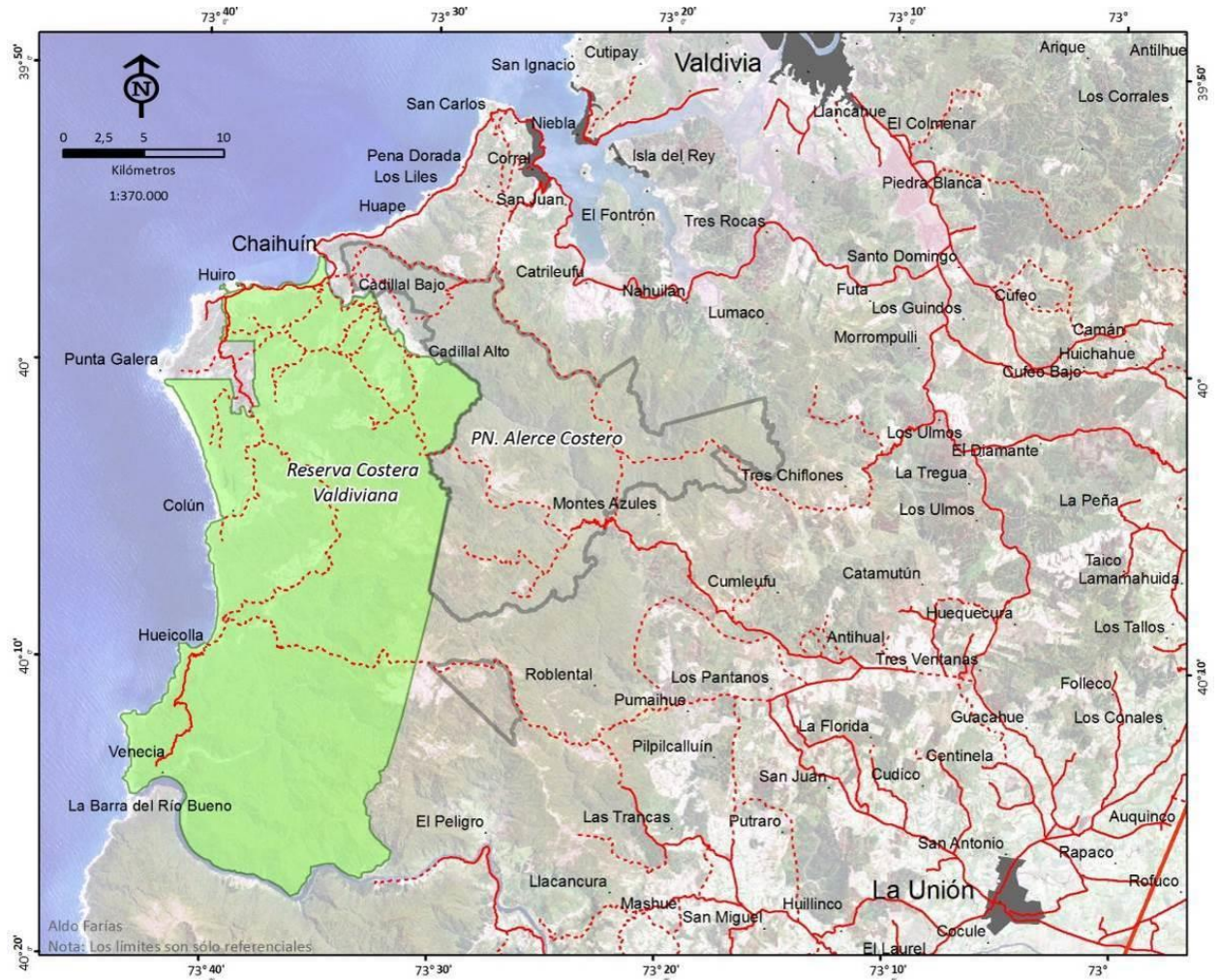


Figure 1.1. Location of the Valdivian Coastal Reserve, within which the VCS project area is located.

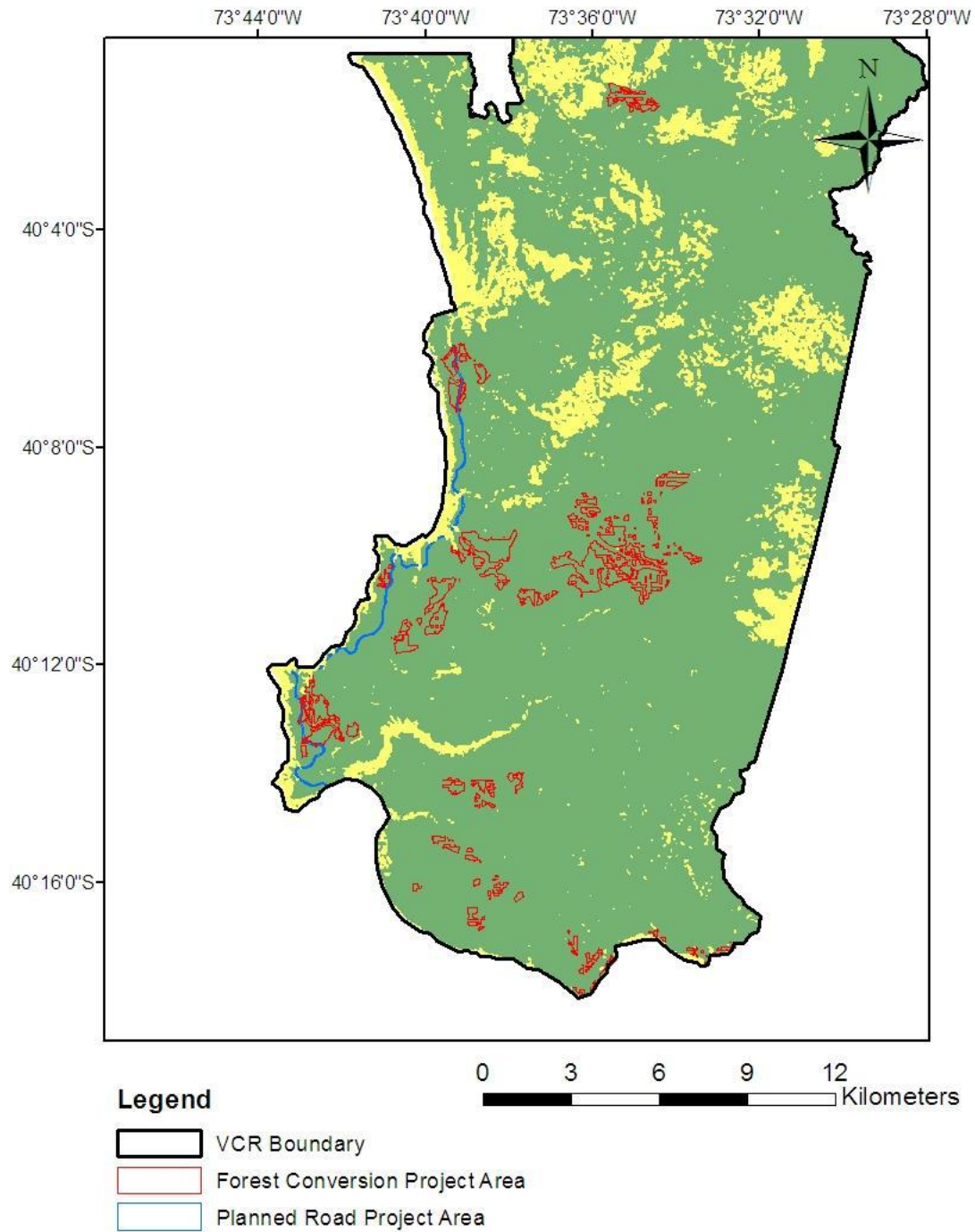


Figure 1.2. Project area within the VCR (blue outline for stop road construction activity, red outline for stop forest conversion to plantation activity) overlaid on classified 2002/2003 Landsat imagery (forest in green, non-forest in yellow).

1.9 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0007	VM0007 REDD+ Methodology Framework (REDD+MF),	1.5
Module	CP-AB VMD0001	Estimation of carbon stocks in the above- and belowground biomass in live tree and non-tree pools	1.1
Module	CP-D VMD0002	Estimation of carbon stocks in the dead-wood pool	1.0
Module	CP-W VMD0005	Estimation of carbon stocks in the long-term wood products pool	1.1
Module	BL-PL VMD0006	Estimation of baseline carbon stock changes and greenhouse gas emissions from planned deforestation	1.2
Module	LK-ASP VMD0009	Estimation of emissions from activity shifting for avoided planned deforestation	1.2
Module	LK-ME VMD0011	Estimation of emissions from market-effects	1.1
Module	M-REDD VMD0015	VMD0015 Methods for monitoring of greenhouse gas emissions and removals	2.1
Module	X-STR VMD0016	VMD0016 Methods for stratification of the project area	1.1
Module	X-UNC VMD0017	VMD0017 Estimation of uncertainty for REDD project activities	2.1
Tool	T-ADD VT0001	Tool for the Demonstration and Assessment of Additionality in VCS Agriculture, Forestry and Other Land Use (AFOLU) Project Activities	3.0
Tool	N/A	AFOLU Non-Permanence Risk Tool	4.2

Tool	T-SIG	Tool for testing significance of GHG emissions in A/R CDM project activities	Latest CDM-EB approved version
------	-------	--	--------------------------------

1.10 Double Counting and Participation under Other GHG Programs

1.10.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.10.2 Registration in Other GHG Programs

Was the project registered or seeking registration under any other GHG programs?

☐ Yes ☒ No

1.11 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.11.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the *VCS Program Definitions* for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.11.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the *VCS Program Definitions* for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.11.3 Supply Chain (Scope 3) Emissions

Do the project activities affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

1.12 Sustainable Development Contributions

TNC's continued ownership and protection of the Valdivian Coastal Reserve has protected carbon stocks, biodiversity, and water resources in the long term through avoided conversion of the coastal forest to *Eucalyptus* plantation and establishment of an easement on the property. By achieving long-term financing of the Reserve, the project has also contributed to sustainable development through promotion of ecotourism in the region.

Table 1: Sustainable Development Contributions

Row number	SDG target	SDG indicator	Net impact on SDG indicator	Current project contributions	Contributions over project lifetime
1)	6.1	Proportion of the population using safely managed drinking water services	Implemented activities to increase	TNC continues its support of the Chaihuin Rural Drinking Water Committee. During the monitoring period this included the inauguration of a drinking water system for the villages of Chaihuin and Huiro and the donation of both water rights and a portion of land from the reserve (outside of the project area) for executing the project. This support has benefitted over 175 families. ¹¹	Provided at least 10 liters of potable water per day to 1,200 people, a 40% increase in the catchment area, over the project lifetime by constructing improved wells
2)	5.0	Achieve gender equality and empower all women and girls	Implemented activities to support women-owned microenterprises	The Vegetable Producers Womens Association and the Lafken Mapu Womens Association provided gastronomic services for TNC's activities in the VCR.	Local women have been empowered through cultivation of traditional skills (handicrafts/cooking) and increased financial independence.

3)	6.3	By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing hazardous release of chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	Implemented activities to increase trash collection in the area of the Reserve	The VCR collaborates with the Municipality of Corral and the coastal towns of Huape, Chaihuin, and Huiro in a project called the Environmental Protection Fund (Fondo del Proteccion Ambiental, FPA), focused on implementing a program to manage domestic waste. The program created over 40 waste collection points.	Management of waste has been improved to avoid contamination (soil, water) and attract tourists.
4)	8.9	8.9.1 Tourism direct GPD as a proportion of total GDP and in growth rate	Implemented activities to support local tourism.	The presence of the VCR attracted around 7,000 visitors annually during the monitoring period, resulting in increased incomes for around 30% of the local population. VCR has also trained local community members to work as guides within the reserve. ¹²	The presence of the VCR has attracted approximately 50,000 visitors over the period from 2003 to 2023, contributing income to local livelihoods.

1.13 Commercially Sensitive Information

Not applicable – no commercially sensitive information has been excluded from the public version of the monitoring report.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification	The process of stakeholder identification and a list of stakeholders is described Appendix 3 Section 1 below. The VCR identified five key communities that are closest to the project area and more marginalized to focus its outreach activities. These communities have members living near the VCR or have members who regularly travel to the area or are in some way dependent upon the VCR for income, livelihood, or cultural values. These five communities are Huape, Chaihuín, Huiro, Cadillal Bajo, and Cadillal Alto.
Legal or customary tenure/access rights	Appendix 3 Section 3 describes land tenure rights in the project zone, and documents cases where the VCR worked with local communities to help families formalize land title where it had been lacking. Local communities around the VCR also have customary access rights to land around the reserve. These lands are used for livestock grazing, fruit harvest, firewood harvest on community properties. Communities also travel through VCR lands to access fishing areas. Additionally, TNC works with local communities to grant licenses for resource access on lands within the reserve, as well as to donate water rights to local families through the local water utility. Page 8 of the document “Community Engagement Plan for the Valdivian Coastal Reserve” describes these agreements: silvopasture land use by

	Ganaderos el Valle ranchers' association, access to fishing areas granted to Huiro Indigenous Fishers' Association, and water rights granted through the Chaihuin Water Utility Committee.
Stakeholder diversity and changes over time	Appendix 3 below provides a detailed description of each key stakeholder community identified by the VCR.
Expected changes in well-being	Under the baseline scenario, TNC has made the reasonable assumption that should the project not have been initiated, the conditions at the project start would have remained constant. Data collected prior to the project start (2003) serves as baseline data for stakeholder well-being, and the project has conducted period monitoring of community indicators throughout the project lifetime. The project's Community Monitoring Plan laid a framework for tracking community well-being and the 2014 Monitoring & Implementation report found the project's net impacts on the community to be almost entirely positive in comparison with the baseline scenario. Since this implementation report, 2014, TNC has conducted stakeholder surveys via consultants to determine community impacts and satisfaction within the monitoring period. The results of this work, as well as a plan to improve community engagement moving forward, are described in the document "Community Engagement Plan for the Valdivian Coastal Reserve.pdf".
Location of stakeholders	See Appendix 3 below for a description of stakeholder locations.
Location of resources	See Appendix 3 below for a description of the location of stakeholder resources.

2.1.2 Stakeholder Consultation and Ongoing Communication

Ongoing consultation	The VCR staff have frequent meetings with local communities and community groups to inform them about reserve and carbon project activities. During the monitoring period, the VCR hired a third-party consulting group to survey local communities to get an understanding of how the VCR is doing in terms of community relations. The
----------------------	--

	survey found room for improvement, and as a result, the VCR is hiring a new socio-community expert to join the VCR team and implement a new 2021-2026 Community Engagement Plan². The first phase of implementing this plan involved 13 workshops organized by TNC with a wide range of stakeholder groups to learn more and receive feedback on VCR's community engagement efforts³.
Date(s) of stakeholder consultation	Although the VCR meets with local communities and stakeholder groups frequently, the results of the previous verification were distributed to communities in meetings that took place on the following dates: Cadillal (21-January-2016), Huiro (29-January-2016), Chaihuín (18-January-2016) y Huape (05-February-2016)
Communication of monitored results	Each organization was given 3 copies of the Carbon Project summary document and summary of the 2015-2023 result. In addition, they were given a copy of the document "Protocol that regulates the relations of the Valdivian Coastal Reserve with different stakeholders of the territory". Then, the contents of both documents were presented and explained. Finally, commitments were defined by the Conservancy, related to the availability to clarify any doubts related to the documents and by the organizations involved, they will make the documents available to the community for anyone who wants to review them.
Consultation records	All inquiries and requests from the community are received in written form at the administration of the Valdivian Coastal Reserve, can be handwritten or printed and must indicate the date and be signed. They can be handwritten or printed and signed by the person or representative of the group making the consultation or request. All inquiries and requests are answered in written form. All these requests are archived by year and kept in the VCR administration.
Stakeholder input	As a result of feedback received in a survey conducted by third-party consultants, the VCR is hiring a new socio-community expert to manage community relationships. The

² Community Engagement Plan for the Valdivian Coastal Reserve

³ "FY22 Semi-Annual Report Valdivian Coastal Reserve", January 2022.

VCR is also implementing a new Community Engagement Plan for 2021-2026.

2.1.3 Free, Prior, and Informed Consent

Consent	See Appendix Section 3.4 for a description of the consent process that took place at the beginning of the project. All conflicts that have been raised in the monitoring period have been resolved through legal means.
Outcome of FPIC	As the project involved the purchasing of lands from a private company, no community lands were part of the project area. However, TNC has made great efforts to improve access to the lands of the reserve to local customary rights holders in comparison to the pre-project situation, through efforts such as allowing local community members to harvest NTFPs or graze cattle on reserve lands, conduct community management of forest areas, or hold fishing licenses at beaches within the reserve. All habitation within the VCR was identified and titles of these properties donated to residents, thus no one has been required to relocate due to the project (i.e. acquisition of the reserve). The only relocation related to the project was at the request of the Nauco–Atero family, in which they requested to move from the site that they had inhabited in Colún to Huiro. TNC granted this request and the family has moved, through the formal process of titling to a new 12-ha site in Huiro to the Nauco family, conducted in conjunction with the Corporacion Nacional de Desarrollo Indigena (CONADI), and recognized as indigenous land.

2.1.4 Grievance Redress Procedure

Feedback and Grievance Redress Procedure

Through the VCR's community engagement process (focus groups, community roundtables, etc), community members are invited to raise concerns with Reserve leadership during meetings. VCR staff also distribute contact information, including email addresses and phone numbers/Whatsapp contact info, that community members can use if they wish to raise

grievances privately. By opening up multiple channels of communication, including the traditional format of community meetings as well as allowing for Whatsapp voice messages in addition to written messages, the VCR is using the most culturally-appropriate means for receiving feedback from the community.

In accordance with TNC's 'open door' policy, VCR staff accept whatever concern or grievance is presented, whether verbal (through phone calls, Whatsapp messages, or in-person communications) or written, and respond to it to initiate the resolution process as soon as possible. In cases of minor concerns, requests for information, or questions related to the VCR project activities, the community or stakeholder group member is requested to convey their concern or request in writing to the VCR administration. The VCR administration will reply within a maximum of 10 days from the date of receipt, indicating the manner in which the request will be addressed, either through written clarification, face-to-face meeting, or assembly.

TNC endeavors to prevent confusions or conflicts from arising by undertaking the following actions:

- Maintaining information on the VCR project on its website
- Providing updates on VCR project activities in the trimesterly bulletin
- Maintaining the 'open door' policy for claims and suggestions
- Providing access to meetings, particularly those related to community activities

In the case of a more serious issue or conflict, TNC follows three steps:

1. TNC will first attempt to address the concern internally, seeking a solution based on mutual consensus of both parties and providing a written response to ensure clarity between both parties.
2. If the grievance is not able to be addressed internally and greater mediation is needed, the TNC will call on a neutral third-party mediator, the Alcalde de la Comuna, to assist in the resolution. The VCR is committed to following this procedure and achieving consensus with the community in regard to its activities and in doing so optimize the benefits that can be produced for them.
3. In the unlikely event that the conflict is not resolved satisfactorily with the intervention of the neutral third-party mediator, the conflict will be referred to either a) arbitration in the relevant district, or b) court in the relevant district, without prejudice to the complainant's ability to submit the grievance to the relevant competent supranational adjudicatory body.

TNC maintains a database to store documents and a tracking system for complaints and grievances in order to monitor and ensure that they are addressed within the given timeframe and resolved satisfactorily. The database contains basic information on the grievance including:

- Date of submission
- Individual or group submitting the grievance
- Request, concern, or grievance (classification)
- Date of reply by TNC
- Status of resolution
- Notes

Lastly, TNC makes information on grievances and project responses available to the public through an update during the annual meeting.

Grievances received	Resolution and outcome
During the monitoring period, claims were made to land within the VCR, but outside of the project area, by local families.	The VCR pursued a legal resolution process that resulted in small parcels of land (from the reserve but outside of the project area) being donated to the local families.

2.1.5 Public Comments

Summary of comments received	Actions taken
None received	

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

Liliana Pezoa, Administrator of the Valdivian Coastal Reserve, TNC

Liliana has 20 years of conservation and community engagement experience with TNC, acting as Conservation Coordinator and later Administrator of the VCR. She directs the team of Park Rangers that manages the Reserve and conducts community outreach meetings and activities.

Julio Giraldo Bermudez, Carbon Markets Lead, TNC

Julio has over 10 years of experience in quantification and verification of organizational carbon footprints, products, and processes. Julio represents the TNC-Global team that administers the carbon project.

TerraCarbon LLC

TNC has contracted with TerraCarbon to quantify carbon offsets and develop project documentation. TerraCarbon has 18 years of experience in carbon project development.

2.2.2 Risk assessment

	Risk identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	No natural risks to stakeholder wellbeing as a result of project activities are identified. risk identified. The human-induced risk to stakeholder wellbeing identified at validation was the potential for the Reserve's promotion of tourism to result over-tourism, which has the potential to bring negative change to the social context of the local communities surrounding the Reserve.	One of the ten fundamental objectives of the project is to "Help to sustain and improve the well-being of rural and indigenous human communities surrounding the Reserve". To achieve this objective and mitigate risks of overtourism, the project monitors tourism numbers to ensure they stay within the capacity of the Reserve. The project also monitors negative visitor impacts (ex. by monitoring waste dumping, conducting water quality testing, etc.) and promotes environmental awareness programs to ensure tourism remains low-impact.
Risks to stakeholder participation	A risk to stakeholder participation identified at validation was that increased tenure rights may lead to internal conflicts within communities.	TNC mitigated this risk by improving training and capacity building for local institutions, as described in Section 5.1 of the Community Engagement Plan,

		and by serving as a role model for peaceful and effective grievance resolution. ⁴
Working conditions	Work within the VCR includes low-level risks typically associated with activities conducted in sites with little infrastructure and irregular conditions. The level of risk varies depending on the type of employment in the VCR and the associated activities, although none of the work requires undue exposure to risks.	To mitigate this risk, annual reviews of workplace order, hygiene, and safety are conducted. This process reviews standards and measures for risk prevention for compliance as provides suggestions for improvements and preventative measures to avoid accidents.⁵ Work in the VCR does not require the operation of heavy machinery or vehicles larger than the rangers' pickup trucks. The VCR has a formal contingency plan in case of accidents, and park rangers are trained in carrying out these procedures, minimizing risks, and providing first aid. In the VCR, safety programs are in place to minimize risks. The VCR's operating procedures are designed with safety as a primary concern. Any type of activity that could present a risk is accompanied by the appropriate equipment and training. In particular, rangers have been trained in the use of motorcycles and small boats for making rounds within the VCR, providing security equipment and identifying risks pertinent to the VCR, such as the poor state of

⁴ Community Engagement Plan for the Valdivian Coastal Reserve

⁵ Annex 20.1.1, Reporte de Actividades, Plan de Manejo – Programs. Reserva Costera Valdiviana 2015-2016.

		parts of the road network. Transportation within the VCR is planned with precaution; for example, when traveling south, the road to Hueicolla fords the river of the same name, but the river is only crossed when safe conditions can be confirmed, especially with regard to tides.⁶
Safety of women and girls	A risk towards the safety of women and girls identified at validation was that women's financial independence (through project activities focused on women's empowerment through owning small businesses) might create conflicts within families and may lead to women quitting.	TNC has mitigated this risk by ensuring that not only are women financially empowered through gender-balanced development opportunities such as owning small businesses, but also that women have fair representation in VCR community outreach efforts. This allows opportunities for women's voices to be heard in the engagement process, which will help raise awareness of any negative impacts of the VCR's gender-balanced community development efforts.⁷
Safety of minority and marginalized groups, including children	The risk of loss of traditional culture as a result of increased influx of tourism and business activities was identified at project validation. No risk to children was identified.	TNC mitigated this risk by supporting and encouraging local cultural activities and sale of handicrafts, foods, etc. TNC also identified the smallest and most marginalized local communities (See Appendix Section 3.1) to be the primary focus of engagement activities, which resulted in improvements to livelihoods (e.g. improved access to the project area for NTFP collection, improved access to clean water, etc.). No adverse impacts on

⁶ Executive Decree No. 1139/2009, 'Worker Relations', G3 Stakeholder Engagement, VCR CCB PD. Page 40.

⁷ Community Engagement Plan for the Valdivian Coastal Reserve

		minority or marginalized groups such as children resulted from project activities.
Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	The risk of increased pollutants as a result of sustainable tourism activities was identified at project validation.	TNC mitigated this risk by monitoring tourism levels and by having regular discussions of cultural impacts at community meetings.

2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁸	Mitigation or preventative measure(s) taken
Discrimination	Risk of workplace discrimination or discriminatory hiring practices.	The project is in compliance with Article 19 of the Chilean Constitution which prohibits workplace discrimination, as well as Article 2 of the Chilean Labor Code which forbids workplace discrimination. ⁹ TNC's Equal Employment Opportunity, Affirmative Action, and Diversity Policy, provided to new employees during onboarding ¹⁰ , prohibits discrimination and protects individuals from being treated unfairly based on unique personal characteristics such as race, color, national or regional origin,

⁸ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

⁹ <https://cms.law/en/int/expert-guides/cms-expert-guide-on-discrimination-in-the-workplace/chile>

¹⁰ See document "Equal Employment Opportunity, Affirmative Action, and Diversity Policy.pdf" in Supporting Documents.

		etc. Any allegation of discrimination or any other violation is investigated, and appropriate action is taken upon conclusion of the investigation, which may include disciplinary action. Lastly, TNC is committed to inclusive hiring practices, per page 5 of The Nature Conservancy Code of Conduct¹¹. The Reserve makes an effort to hire staff from the local communities, including park rangers and office staff.
Sexual harassment	Risk of sexual harassment occurring within the work environment.	The project is in compliance with Chilean Law No. 21.643, which prohibits workplace sexual harassment. Additionally, the TNC Code of Conduct does not tolerate harassment, including sexual harassment.¹² TNC's Workplace Conduct and Prevention of Harassment and Reporting policies¹³, provided to new employees during onboarding¹⁴, also prohibits harassment and other kinds of unprofessional behavior and requires employees to report concerns of misconduct or violation of law. Any allegation of harassment or any other violation is investigated, and appropriate action is taken upon conclusion of the investigation, which may include disciplinary action. Lastly, VCR employees are required to complete an annual

¹¹ https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

¹² The Nature Conservancy Code of Conduct, page 5.

https://www.nature.org/content/dam/tnc/nature/en/documents/2020_tnc_CoC_english.pdf

¹³ Internal TNC documents available upon request

¹⁴ Internal TNC documents available upon request

		Ethics Training, which includes gender-based violence.
Gender equity in labor and work	Unequal pay for the same work or Unequal workplace opportunities on the basis of gender may occur in the hiring or contracting process, or in the operations process, in the project design or implementation.	TNC is committed to inclusive hiring practices, per page 5 of The Nature Conservancy Code of Conduct ¹⁵ , which says TNC is “inclusive of all people and look for a wide range of talent when recruiting and hiring.”, and “Our values and policies are designed to protect individuals from being treated unfairly based on unique personal characteristics such as: race, color, nationality or regional origin, ethnicity, tribe, religion, age, ability, sex or gender identity, sexual orientation or military or veteran status.” TNC publicly states on their website that “Staff and others who violate the Code will face consequences.” ¹⁶
Forced labor	Employees, contractors, or others are forced to work in the design and implementation of the project against their will through the use of force, fraud, or coercion.	The project is in compliance with Article 19 of the Chilean Constitution which prohibits forced labor. Page 8 of The Nature Conservancy Code of Conduct ¹⁷ defines human rights violations as the use of child labor, poor working conditions, involuntary servitude, human trafficking. The Code requires respect and support of the furtherance of human rights.
Child labor	Children under age 18, the minimum age established by Chilean legislation ¹⁸ , are	The project is in compliance with Chilean law prohibiting child labor under the age of 18. ¹⁹

¹⁵ https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

¹⁶ https://www.nature.org/en-us/about-us/who-we-are/accountability/?tab_q=tab_container-tab_element_103606965

¹⁷ https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

¹⁸ Articles 13 and 17 of the Labor Code; Article 13 of Chilean Law No 21.271

¹⁹ Articles 13 and 17 of the Labor Code; Article 13 of Chilean Law No 21.271

	employed in the design and implementation of the project.	Additionally, page 8 of The Nature Conservancy Code of Conduct ²⁰ defines human rights violations as the use of child labor, poor working conditions, involuntary servitude, human trafficking. The Code requires respect and support of the furtherance of human rights.
Human trafficking	Individuals are hired or contracted to support the design or implementation of the project through the use of force, fraud, or coercion to obtain some type of labor or commercial sex act.	The project is in compliance with Chilean law prohibiting human trafficking. ²¹ Additionally, page 8 of The Nature Conservancy Code of Conduct ²² defines human rights violations as the use of child labor, poor working conditions, involuntary servitude, human trafficking. The Code requires respect and support of the furtherance of human rights.

2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
Risk of not recognizing, respecting, or promoting the protection of local communities' customary rights to the land in the VCR. human rights violations occurring as a result of project activities or interactions with local community members.	The project works closely with local community members to ensure that customary rights are recognized and granted. Appendix 3 describes the various customary rights the Reserve grants to local community members. To ensure community members are satisfied with customary access to the Reserve, the project holds regular stakeholder engagement meetings to receive feedback and adjust

²⁰ https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

²¹ Chilean Law 20.507

²² https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

	operations or access rights if necessary. Additionally, the project operates in alignment with The Nature Conservancy's Code of Conduct²³, Human Rights Guide for Working with Indigenous Peoples and Local Communities²⁴, and Voice, Choice, and Action Framework²⁵.
--	--

2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Mitigation(s) or preventative measure taken
The risk of loss of traditional culture as a result of increased influx of tourism and business activities was identified at project validation.	TNC mitigated this risk by supporting and encouraging local cultural activities and sale of handicrafts, foods, etc. TNC also identified the smallest and most marginalized local communities (See Appendix Section 3.1) to be the primary focus of engagement activities, which resulted in improvements to livelihoods (e.g. improved access to the project area for NTFP collection, improved access to clean water, etc.). The project operates in alignment with The Nature Conservancy's Code of Conduct²⁶, Human Rights Guide for Working with Indigenous Peoples and Local Communities²⁷, and Voice, Choice, and Action Framework²⁸.

2.3.4 Property Rights

²³ https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

²⁴ <https://www.tnchumanrightsguide.org/wp-content/uploads/TNC-Full-Guide-01-01.pdf>

²⁵ <https://tncvoicechoiceaction.org/>

²⁶ https://www.nature.org/content/dam/tnc/nature/en/documents/Interactive_CODE_English.pdf

²⁷ <https://www.tnchumanrightsguide.org/wp-content/uploads/TNC-Full-Guide-01-01.pdf>

²⁸ <https://tncvoicechoiceaction.org/>

Risks identified	Mitigation or preventative measure(s) taken
There is a risk of disputes with local community members over property rights and access to land within the VCR.	If concerns are raised by local communities or Indigenous Peoples over rights and access to land within the VCR, TNC follows fair legal recourse to resolve the concern. When claims have arisen within the monitoring period in lands outside of the project area but within the VCR, it has resulted in the returning of lands to the holders of customary titles. TNC also allows local community members access to land within the Reserve for gathering of non-timber forest products and collection of firewood from previous Eucalyptus plantations.

2.3.5 Benefit Sharing

Summary of the benefit sharing plan	No property rights are impacted by the project, therefore a formal Benefit Sharing plan is not needed. See Section 2.3.4 above. However, the VCR has been committed to support and outreach to surrounding communities since the beginning of the project through the VCR social program, which includes the seven objectives listed below: 1. All households in two villages (Chaihuín and Huiro) will have year-round access to safe drinking water. 2. Waste is managed appropriately to avoid contamination (soil, water) and attract tourists 3. The communities will have a better understanding of environmental and natural resource conservation 4. Community members will have more control over their resources 5. Community members will have increased supplementary incomes 6. Women in the communities have more financial independence and contribute to family income
-------------------------------------	---

	Community members are generally satisfied with community outreach activities of the VCR
Benefit sharing during the monitoring period	Objective 1: TNC continues its support of the Chaihuin Rural Drinking Water Committee. During the monitoring period this included the inauguration of a drinking water system for the villages of Chaihuin and Huiro and the donation of both water rights and a portion of land from the reserve (outside of the project area) for executing the project. This support has benefitted over 175 families.²⁹ Objective 2: The VCR collaborates with the Municipality of Corral and the coastal towns of Huape, Chaihuin, and Huiro in a project called the Environmental Protection Fund (Fondo del Proteccion Ambiental, FPA), focused on implementing a program to manage domestic waste. The program created over 40 waste collection points.³⁰ Objective 3: Environmental education activities were carried out in schools during the monitoring period.³¹ Objective 4: During the monitoring period, a land-sharing cattle grazing agreement with the El Valle Small Ranchers Association, and fishing use agreements with multiple fishers' unions from local communities.³² Objective 5: The presence of the VCR attracted around 7,000 visitors annually during the monitoring period, resulting in increased incomes for around 30% of the local population. VCR has also trained local community members to work as guides within the reserve.³³ Objective 6: The Vegetable Producers Womens Association and the Lafken Mapu Womens Association provided gastronomic services for TNC's activities in the VCR.³⁴ Objective 7: A survey carried out by a third-party in 2019 found that 66% of respondents were satisfied with the VCR's support of local communities. The VCR is

²⁹ Reporte de Actividades, Plan de Manejo – Programas, Reserva Costera Valdiviana, 2015-2016

³⁰ Reporte de Actividades, Plan de Manejo, 16.17.1.6 – Programas, Reserva Costera Valdiviana, 2015-2016

³¹ Community Engagement Plan for the Valdivian Coastal Reserve

³² Community Engagement Plan for the Valdivian Coastal Reserve

³³ Community Engagement Plan for the Valdivian Coastal Reserve

³⁴ Community Engagement Plan for the Valdivian Coastal Reserve

implementing an action plan to improve community engagement to address the concerns of the remaining community members, as described in “Community Engagement Plan for the Valdivian Coastal Reserve.pdf”.

2.4 Ecosystem Health

Risk identified		Mitigation or preventative measure(s) taken during the monitoring period
Impacts on biodiversity and ecosystems	No risk identified.	Project activity of avoided conversion of native forest to <i>Eucalyptus</i> plantation has a positive impact on biodiversity and ecosystems compared to the baseline.
Soil degradation and soil erosion	No risk identified.	Project activity of avoided conversion of native forest to <i>Eucalyptus</i> plantation has a positive impact on soil degradation and erosion compared to the baseline.
Water consumption and stress	No risk identified.	Project activity of avoided conversion of native forest to <i>Eucalyptus</i> plantation has a positive impact on water consumption and stress compared to the baseline.

2.4.1 Rare, Threatened, and Endangered species

Alerce (<i>Fitzroya cupressoides</i>)	The project did not adversely impact habitat. Conversely, maintenance of native forest via avoided deforestation improves tree diversity, and forest inventory helps reserve staff monitor presence/absence.
Darwin's fox (<i>Pseudalopex fulvipes</i>)	The project did not adversely impact habitat. Conversely, maintenance of native forest via avoided deforestation improves habitat and sampling via camera traps helps reserve staff monitor presence/absence.

<i>Pudú</i> (<i>Pudu puda</i>)	The project did not adversely impact habitat. Conversely, maintenance of native forest via avoided deforestation improves habitat and sampling via camera traps helps reserve staff monitor presence/absence.
<i>Guña cat</i> (<i>Leopardus guigna</i>)	The project did not adversely impact habitat. Conversely, maintenance of native forest via avoided deforestation improves habitat and sampling via camera traps helps reserve staff monitor presence/absence.
<i>Darwin's frog</i> (<i>Rhinoderma darwini</i>)	The project did not adversely impact habitat. Conversely, maintenance of native forest via avoided deforestation improves habitat and sampling efforts help reserve staff monitor presence/absence.
<i>Valdivian toad</i> (<i>Alsodes valdiviensis</i>)	The project did not adversely impact habitat. Conversely, maintenance of native forest via avoided deforestation improves habitat and sampling efforts help reserve staff monitor presence/absence.

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified.	The project activity, avoided deforestation of native forest habitat and conversion to Eucalyptus plantation, inherently protects habitats for rare, threatened, and endangered species.
Areas for habitat connectivity	No risk identified.	The project activity, avoided deforestation of native forest habitat and conversion to Eucalyptus plantation, inherently improves habitat connectivity.

2.4.2 Introduction of Species

Not applicable – no planting or species introduction took place within the project area during the monitoring period.

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
---------------------------	--

Feral dogs	The spread of feral dogs is being addressed by TNC through education and outreach to neighboring communities to improve management of domestic dogs, restrict their movement, and neutering campaigns. TNC is also exploring the possibility of retiring old logging roads (which facilitate access of domestic dogs to the forest interior and contact with native wildlife).
Non-native gorse	Occurrence of gorse will be monitored to allow for ongoing threat assessment and identify the need for direct intervention.
American mink	Camera trap monitoring allows reserve staff to perform ongoing threat assessments and identify the need for direct intervention.

	Risks identified	Mitigation or preventative measure(s) taken
Feral dogs	Feral dogs have been identified as an important risk to be addressed in the management of the VCR, as vectors of disease (see below) and as predators of native fauna, particularly the pudu.	This risk is being addressed by TNC through education and outreach to neighboring communities to improve management of domestic dogs, restrict their movement, and neutering campaigns. TNC is also exploring the possibility of retiring old logging roads (which facilitate access of domestic dogs to the forest interior and contact with native wildlife).
Non-native gorse	Non-native gorse, an invasive shrub, though widespread, is mostly limited to roadsides and is not considered a significant threat to conservation goals in the VCR.	Notwithstanding, occurrence of gorse will be monitored to allow for ongoing threat assessment and identify the need for direct intervention.
American mink	American mink poses a threat to native species through both hunting and habitat competition.	Camera trap monitoring allows reserve staff to perform ongoing threat assessments and identify the need for direct intervention.

2.4.3 Ecosystem conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified.	Project is an avoided planned deforestation REDD project. No ecosystem conversion took place in the project area.

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Over the monitoring period from November 2014 to November 2023, The Nature Conservancy continued forest protection and community outreach and education activities, and updated the management plan (in effect 2021-2026) for the Valdivian Coastal Reserve. A visitor center was opened in 2023. No loss events occurred over the monitoring period, evaluated and documented in Section 5 (Quantification of GHG Emission Reductions and Removals).

TNC has continued to engage through the monitoring period with the MOP and regional authorities and through the forum of the Technical and Legal Coordination Committee (CCTL), the collaborative multilateral body advising on the Coastal Highway, to advocate for re-routing the Coastal Highway. Ongoing communication with the MOP's regional office also has resulted in the MOP refocusing its resources on developing the route connecting Corral to La Unión rather than on the Coastal Highway.

The Reserve's park rangers continue patrols of the reserve, typically working ten-day shifts, with five days off for rest, with support from the coordinator and manager of community development. The VCR administrator has met annually with the ranger team to develop annual work plans based on the VCR management plan. Rangers' responsibilities included control and monitoring, forest fire prevention, environmental education, monitoring threats, wildlife monitoring, and community development. The primary operations center for the park rangers is in Chaihuin, with a peripheral base in Hueicolla. All daily activities conducted by VCR rangers and maintenance staff are recorded in a log; Reserve vehicles also have logs for recording activities undertaken (administrative, maintenance, monitoring, etc.)

A seasonal contract with a local fire brigade for Prevention and Combat of Forest Fires is established each summer season for a period of at least two months to supplement the Reserve's park guard staff in their fire prevention activities. This program is coordinated with the National Forest Corporation's (CONAF) Fire Control Program.

3.2 Deviations

3.2.1 Methodology Deviations

The following deviation to the methodology was applied in the previous monitoring period:

For monitoring potential for illegal degradation, module M-REDD is employed. Because it is extremely sensitive to ask of community members explicit questions regarding timber harvest activities, instead of the participatory rural appraisal approach specified in module M-REDD, involving direct interviews in communities surrounding the project area to evaluate potential for illegal degradation, an alternative approach was pursued involving consultation with local authorities responsible for tracking these activities (elaborated in Section 4 of the PD).

3.2.2 Project Description Deviations

There are no deviations to the Project Description.

3.3 Grouped Projects

Not a grouped project

3.4 Baseline Reassessment

Did the project undergo baseline reassessment during the monitoring period?

☐ Yes ☒ No

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data Unit / Parameter:	$A_{planned,i}$
Data unit:	Ha
Description:	Total area of planned deforestation over the fixed baseline period for stratum i
Source of data:	Forest permits and engineering plans. Area determination detailed in PD Section 3.1.
Value applied:	0
Justification of choice of data or description of	Detailed in PD Section 3.1.

measurement methods and procedures applied:	
Purpose of data	Calculation of baseline emissions
Any comment:	See Section 5.1 Baseline Emissions of this Monitoring Report and Appendix 1. In VCR REDD APD rev Oct 2015. No deforestation occurs in the second (current) baseline period.

Data Unit / Parameter:	$D\%_{planned,i,t}$
Data unit:	% year ⁻¹
Description:	Projected annual proportion of land that will be deforested in stratum i at year t
Source of data:	Forest permits, engineering plans and remote sensing data. Rate determination detailed in PD Section 3.1.
Value applied:	0
Justification of choice of data or description of measurement methods and procedures applied:	Detailed in PD Section 3.1.
Purpose of data	Calculation of baseline emissions
Any comment:	See Section 5.1 Baseline Emissions of this Monitoring Report and Appendix 1. In VCR REDD APD rev Oct 2015. No deforestation occurs in the second (current) baseline period.

Data Unit / Parameter:	$L-D_i$
Data unit:	%
Description:	Likelihood of deforestation in stratum i
Source of data:	
Value applied:	100%
Justification of choice of data or description of measurement methods and procedures applied:	The likelihood of deforestation ($L-D_i$) is set to 100% as the project area is not “both under government control and zoned for deforestation” (per module BL-PL).

Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$\Delta C_{BSL,planned}$
Data unit:	t CO ₂ -e
Description:	Net CO ₂ emissions in the baseline from planned deforestation
Source of data:	See Table 5.1 in Section 5.1, Baseline Emissions.
Value applied:	Set at start of baseline period
Justification of choice of data or description of measurement methods and procedures applied:	Derived and justified in Section 3 of PD in which baseline is set
Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	<i>LDF</i>
Data unit:	t C m ⁻³
Description:	Logging damage factor for logging stratum <i>z</i> , in stratum <i>i</i>
Source of data:	VMD0011
Value applied:	0.25
Justification of choice of data or description of measurement methods and procedures applied:	Default value for coniferous forests from module VMD0011. Although Eucalypts are not conifers, their growth form is closer to conifers than deciduous or hardwood species, with a predominant stem (with bark) component representing 71% of aboveground biomass ³⁵ , particularly in plantation grown settings as in the project area.

³⁵ Gayoso, J. 2008a. Eucalyptus sp. Resultados Proyecto FONDEF D98i1076

Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	<i>LIF</i>
Data unit:	t C m ⁻³
Description:	Factor for calculating the emissions arising from the creation of logging infrastructure (roads, skid trails and decks) during logging operations per cubic meter extracted
Source of data:	VMD0011
Value applied:	0.29
Justification of choice of data or description of measurement methods and procedures applied:	Default value from methodology VM0007
Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	<i>CF</i>
Data unit:	t C t ⁻¹ d.m.
Description:	Carbon fraction of biomass
Source of data:	IPCC 2006GL
Value applied:	0.47
Justification of choice of data or description of measurement methods and procedures applied:	Global default
Purpose of data	Calculation of project emissions
Any comment:	

Data Unit / Parameter:	<i>D</i>
Data unit:	t d.m.m ⁻³
Description:	Basic wood density of <i>Eucalyptus globulus</i>
Source of data:	IPCC 2006GL
Value applied:	0.5

Justification of choice of data or description of measurement methods and procedures applied:	wood specific gravity of <i>E globulus</i> reported in the IPCC 2006GL
Purpose of data	Calculation of project emissions
Any comment:	

Data Unit / Parameter:	D_{mn}
Data unit:	t d.m.m ⁻³
Description:	Mean wood density of commercially harvested species
Source of data:	IPCC 2006GL
Value applied:	0.5
Justification of choice of data or description of measurement methods and procedures applied:	wood specific gravity of <i>E globulus</i> reported in the IPCC 2006GL – only one species harvested in the project area
Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	WW_s
Data unit:	Dimension- less
Description:	Wood waste. The fraction immediately emitted through mill inefficiency by class of wood product s
Source of data:	VMD005
Value applied:	0.19
Justification of choice of data or description of measurement methods and procedures applied:	Default value from VMD005
Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	SLF_s
Data unit:	Dimensionless

Description:	Fraction of wood products that will be emitted to the atmosphere within 5 years of timber harvest by class of wood product s
Source of data:	VMD005
Value applied:	0.4
Justification of choice of data or description of measurement methods and procedures applied:	Default value from VMD005
Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	Ofs
Data unit:	Dimensionless
Description:	Fraction of wood products that will be emitted to the atmosphere between 5 and 100 years of timber harvest by class of wood product s
Source of data:	VMD005
Value applied:	0.6
Justification of choice of data or description of measurement methods and procedures applied:	Default value from VMD005
Purpose of data	Calculation of baseline emissions
Any comment:	

Data Unit / Parameter:	$NewR_{i,t}$
Data unit:	Ha
Description:	New calculated forest clearance in stratum i at time t by the baseline agent of the planned deforestation where no leakage is occurring
Source of data:	derived in Section 3 of PD
Value applied:	0
Justification of choice of data or description of measurement methods and procedures applied:	Fixed for the first baseline period, derived and justified in Section 3 of PD
Purpose of data	Calculation of baseline emissions

Any comment:	This value applies to deforestation from <i>area of deforestation</i> from any highways constructed or improved in Region XIV, within the leakage zone, which is defined as the area bounded by 1) the coast on the west, 2) the existing north-south highway Rt. 5 on the east, 3) the coastline from the town of Corral to Rt 207 on the north, and 4) the Rio Bueno on the south (representing the southernmost border of the Reserve), by the MOP after the project start date.
--------------	---

Data Unit / Parameter:	LF_{ME}
Data unit:	Dimensionless
Description:	Leakage factor for market effects calculations
Source of data:	VM0007; LK-ME
Value applied:	0.4
Justification of choice of data or description of measurement methods and procedures applied:	Default value where mean merchantable biomass as a proportion of total aboveground tree biomass in forests to which harvest would be displaced is equal to merchantable biomass as a proportion of total aboveground tree biomass within the project boundary. This value is justified because the commercial component of aboveground tree structure in the project area (<i>Eucalyptus globulus</i> plantations) will be nearly identical to areas where harvest could be displaced in Chile to make up for reduction in supply of <i>Eucalyptus globulus</i> wood (i.e. other <i>Eucalyptus globulus</i> plantations).
Purpose of data	Calculation of leakage
Any comment:	This value applies to market leakage calculations for timber harvests avoided in the project case in <i>Eucalyptus</i> plantations

Data Unit / Parameter:	$LK_{CP-ME,c,l}$
Data unit:	Dimensionless
Description:	Leakage factor for displacement of class of planned deforestation agents
Source of data:	VM0007; LK-ASP

Value applied:	0.2
Justification of choice of data or description of measurement methods and procedures applied:	Default value where average productivity of alternative lands is >15% more than the relevant strata in the project area. Justified in Section 3.
Purpose of data	Calculation of leakage
Any comment:	This value applies to activity shifting calculations for native forest to plantation conversion activities avoided in the project case

Data Unit / Parameter:	PF_c
Data unit:	Dimensionless
Description:	Proportion of available area for production of commodity c that is currently forested
Source of data:	Instituto Nacional de Estadísticas (INE). 2007. Censo Agropecuario 2007.
Value applied:	0.34
Justification of choice of data or description of measurement methods and procedures applied:	Justified in Section 3.
Purpose of data	Calculation of leakage
Any comment:	This value applies to activity shifting calculations for native forest to plantation conversion activities avoided in the project case

Data Unit / Parameter:	$COMF_i$
Data unit:	dimensionless
Description:	combustion factor for stratum i (vegetation type)
Source of data:	Default values in Table 2.6 of IPCC, 2006 (Annex 2)
Value applied:	0.45
Justification of choice of data or description of measurement methods and procedures applied:	Value for 'all "other" temperate forests'.
Purpose of data	Calculation of project emissions

Any comment:	
--------------	--

Data Unit / Parameter:	G_{gi}
Data unit:	g kg ⁻¹ dry matter burnt
Description:	Emission factor for stratum i for gas g ,
Source of data:	Defaults in Volume 4, Chapter 2, of the IPCC 2006 Inventory Guidelines in table 2.5 (Annex 2: emission factors for various types of burning for CH ₄ and N ₂ O).
Value applied:	4.7 (CH ₄); 0.26 (N ₂ O)
Justification of choice of data or description of measurement methods and procedures applied:	Value for 'extra tropical forest' category.
Purpose of data	Calculation of project emissions
Any comment:	

4.2 Data and Parameters Monitored

Data Unit / Parameter:	$\Delta C_{P,Def,i,t}$
Data unit:	t CO ₂ -e
Description:	Net carbon stock change as a result of deforestation in the project case in the project area in stratum i at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	First monitoring event in 2011. Every ≤ 10 years
Value applied:	0 t CO ₂ -e for the period 2014-2023
Monitoring equipment:	
QA/QC procedures to be applied:	

Purpose of the data	Calculation of project emissions
Calculation method:	Equation 3, VMD0015
Any comment:	

Data Unit / Parameter:	$\Delta C_{P,DistPA,i,t}$
Data unit:	t CO ₂ -e
Description:	Net carbon stock change as a result of natural disturbance in the project case in the project area in stratum <i>i</i> at time <i>t</i>
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	First monitoring event in 2011. Every ≤ 10 years
Value applied:	0 t CO ₂ -e for the period 2014-2023
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of project emissions
Calculation method:	Equation 20, VMD0015
Any comment:	

Data Unit / Parameter:	$A_{DefPA,u,i,t}$
Data unit:	Ha
Description:	Area of recorded deforestation in the project area stratum <i>i</i> converted to land use <i>u</i> at time <i>t</i>
Source of data:	Monitored at each monitoring/verification event through analysis of classified satellite imagery
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description. Minimum Mapping Unit (MMU) of 0.81 ha, corresponding to 3 pixels by 3 pixels Landsat resolution (90m * 90m), providing close conformance to 0.5 ha Chile DNA forest definition.
Frequency of monitoring/recording:	First monitoring event in 2011. Every ≤ 10 years
Value applied:	0 ha for the period 2014-2023

Monitoring equipment:	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	$A_{DistPA,q,i,t}$
Data unit:	ha
Description:	Area impacted by natural disturbance in post-natural disturbance stratum q in stratum i , at time t
Source of data:	Monitored at each monitoring/verification event through analysis of classified satellite imagery
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description. Minimum Mapping Unit (MMU) of 0.81 ha, corresponding to 3 pixels by 3 pixels Landsat resolution (90m * 90m), providing close conformance to 0.5 ha Chile DNA forest definition.
Frequency of monitoring/recording:	First monitoring event in 2011. Every ≤ 10 years
Value applied:	0 ha for the period 2014-2023
Monitoring equipment:	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	$C_{BSL,i}$
Data unit:	t CO ₂ -e ha ⁻¹
Description:	Carbon stock in all pools in the baseline case in stratum i
Source of data:	Estimated from forest carbon inventory
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description

Frequency of monitoring/recording:	Every $\leq$ 10 years. First measurement in 2011.			
Value applied:				
	Strata	average AGB t CO2/ha	average BGB t CO2/ha	average dead wood t CO2/ha
	Native forest	610.5	175.2	59.3
	<i>E globulus</i> plantation est 1990	284.1	61.3	0
	<i>E globulus</i> plantation est 1991	363.0	78.4	0
	<i>E globulus</i> plantation est 1992	434.7	93.8	0
	AGB = aboveground biomass BGB = belowground biomass			
Monitoring equipment:				
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description			
Purpose of the data	Calculation of project emissions			
Calculation method:				
Any comment:				

Data Unit / Parameter:	$C_{P,Dist,q,i}$
Data unit:	t CO ₂ -e ha ⁻¹
Description:	Carbon stock in pools in post-natural disturbance strata q in stratum i
Source of data:	Conservatively assumed to be zero

Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	
Value applied:	0 t CO ₂ -e ha ⁻¹
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	$A_{DegW,i,t}$
Data unit:	Ha
Description:	Area potentially impacted by degradation processes in stratum i
Source of data:	Delineated based on observations by VCR guard staff and consultation with the District Attorney's office (Fiscalia Regional) of the Ríos Region.
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Consultations conducted every ≤ 2 years. First consultation conducted in 2012.
Value applied:	0 ha
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	$C_{DegW,i,t}$
Data unit:	t CO ₂ -e
Description:	Biomass carbon of trees cut and removed through degradation process from plots measured in stratum i at time t

Source of data:	Estimated from diameter measurements of cut stumps in sample plots
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	N/A
Monitoring equipment:	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	AP_i
Data unit:	Ha
Description:	Total area of degradation sample plots in stratum i
Source of data:	Calculated as 3% of $A_{DegW,i,t}$
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	N/A
Monitoring equipment:	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	$\Delta C_{P,DegW,i,t}$
Data unit:	t CO ₂ -e

Description:	Net carbon stock changes as a result of degradation in stratum i in the project area at time t
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Every ≤ 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area
Value applied:	N/A
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of project emissions
Calculation method:	Equation 8, VMD0015
Any comment:	

Data Unit / Parameter:	$\Delta C_{LK-AS,planned}$
Data unit:	t CO ₂ -e
Description:	Net greenhouse gas emissions due to activity shifting leakage for projects preventing planned deforestation
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	0 t CO ₂ -e
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of leakage
Calculation method:	Equation 1, VMD0009
Any comment:	

Data Unit / Parameter:	$A_{defLK,i,t}$
------------------------	-----------------

Data unit:	ha
Description:	The total area of deforestation by the baseline agent of the planned deforestation in stratum i at time, t
Source of data:	Monitored through investigation of MOP construction records or current road maps and remote imagery.
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	0 ha for the period 2014-2023
Monitoring equipment:	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions
Calculation method:	
Any comment:	The area of this parameter is restricted to deforestation from any highways constructed or improved in Region XIV, within the leakage zone, which is defined as the area bounded by 1) the coast on the west, 2) the existing north-south highway Rt. 5 on the east, 3) the coastline from the town of Corral to Rt 207 on the north, and 4) the Rio Bueno on the south (representing the southernmost border of the Reserve), by the MOP after the project start date.

Data Unit / Parameter:	$LKA_{planned,i,t}$
Data unit:	ha
Description:	The area of activity shifting leakage in stratum i at time t
Source of data:	Calculated as $NewR_{i,t} - A_{defLK,i,t}$
Description of measurement methods and procedures to be applied:	
Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	0 ha
Monitoring equipment:	

QA/QC procedures to be applied:	
Purpose of the data	Calculation of leakage
Calculation method:	Equation 5, VMD0009
Any comment:	

Data Unit / Parameter:	$\Delta C_{BSL,i}$
Data unit:	t CO ₂ -e ha ⁻¹
Description:	Net carbon stock changes in all pools in baseline stratum <i>i</i>
Source of data:	Sourced from mean forest carbon stock estimates from forest carbon inventories of project area for equivalent strata in area of activity shifting leakage
Description of measurement methods and procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Frequency of monitoring/recording:	Stock estimates updated every ≤ 10 years
Value applied:	Calculated in the VCS Project Document for project years 2004-2013 and in baseline revision for years 2014-2023
Monitoring equipment:	
QA/QC procedures to be applied:	Detailed procedures provided below under monitoring plan description.
Purpose of the data	Calculation of baseline emissions
Calculation method:	
Any comment:	

Data Unit / Parameter:	$LK_{MarketEffects,timber}$
Data unit:	t CO ₂
Description:	Total GHG emissions due to market- effects leakage through decreased timber harvest sold into domestic markets
Source of data:	Calculated
Description of measurement methods and procedures to be applied:	

Frequency of monitoring/recording:	Every ≤ 10 years
Value applied:	34,198.2 t CO ₂ for the period 2014-2023
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of leakage
Calculation method:	Equation 2, VMD0011
Any comment:	

Data Unit / Parameter:	$A_{burn,i,t}$
Data unit:	ha
Description:	Area burnt in stratum i at time t
Source of data:	CONAF fire database and analysis of remote sensing data
Description of measurement methods and procedures to be applied:	Consultation of CONAF fire database identifying incidence of fire followed by remote sensing analysis to delineate and quantify area, detailed below under monitoring plan description
Frequency of monitoring/recording:	Areas burnt shall be monitored at least every five years or if verification occurs on a frequency of less than every 5 years examination must occur prior to any verification event
Value applied:	0 ha
Monitoring equipment:	
QA/QC procedures to be applied:	
Purpose of the data	Calculation of project emissions
Calculation method:	
Any comment:	

4.3 Monitoring Plan

Data Archiving

All data sources and processing, classification and change detection procedures will be documented and stored in a dedicated long-term electronic archive maintained by TNC at its office in Chaihuin, with a backup file at its office in Valdivia.

Information related to monitoring deforestation maintained in the archive will include:

- Base (raw) imagery used (specifying type, source, resolution, imagery date, acquisition date)
- Any cartographic data used to geo-reference the image (source, base data)
- Data used for training classification, if supervised
- Definition of land cover classes assessed
- Documentation of software type and procedures applied (including all pre-processing steps and corrections, spectral bands used in final classifications, and classification methodologies and algorithms applied)
- Classified images
- Data used in accuracy assessment - ground-truth points (including GPS coordinates, identified land-use class) and/or sample points of high resolution imagery
- Internal auditing procedures constitute an accuracy assessment matrix with minimally the following errors presented: overall classification accuracy, error of omission of each land-use category (forest and non-forest), and error of commission of each land-use category (forest and non-forest). The overall accuracy outcome must be 90% or more.

Data archived will be maintained through at least two years beyond the end of the project crediting period, through November 2025. Given the extended time frame and the pace of production of updated versions of software and new hardware for storing data, electronic files will be updated periodically or converted to a format accessible to future software applications, as needed.

Updating forest carbon stock estimates

Forest carbon stock estimates used to calculate emissions from deforestation and natural disturbance will use estimates derived from field measurements less than or equal to 10 years old. In the event that any deforestation is discovered in the project area, forest carbon stock estimates older than 10 years will be updated where deforestation is detected. Initial above- and belowground biomass and dead wood stock estimates from the 2011 inventory are valid and treated as constant through 2021,

No deforestation occurred in the baseline or with-project scenario after 2021, and thus forest carbon stock estimates were not updated.

In the event that forest carbon stocks are re-assessed, fifty (50) point samples (ten clusters of five points) will be randomly located in the project area and basal area measured (following field protocols in Annex 15) in 2021. Biomass will be estimated from basal area applying a Biomass:Basal Area Ratio (BBAR) of 2.87 (derived for the VCR in the 2011 inventory, Annex 1). Where the re-measured estimate of live above- and belowground forest biomass carbon is within the 90% confidence interval of the 2011 estimate, the 2011 stock estimate will continue to be used in the next 10 year period. If the re-measured estimate is outside (i.e., greater than or less than) the 90% confidence interval of the 2011 estimate, then the new stock estimate will be used in the next 10-year period.

Quality Assurance /Quality Control and Data Archiving Procedures

The following steps will be taken to control for errors in field sampling and measurements and data analysis:

1. Field crews will be fully trained in all aspects of the field data collection prior to conducting formal sampling and measurements and adhere to field measurement protocols outlined in standard field operating procedures. Pilot sample points will be used for field training prior to initiating formal measurements to appraise field crews and identify and correct any errors in field measurements. Detailed standard procedures for all aspects of field measurement activities are provided in Annex 15: “PROTOCOLOS DE CAMPO PARA LA MEDICIÓN Y MONITOREO DE LA BIOMASA FORESTAL EN LA RESERVA COSTERA VALDIVIANA.” Field crew leaders will be responsible for ensuring that field protocols are followed to ensure accurate and consistent measurement. Prism calibration will be verified prior to use. All borderline trees will be measured and assessed against prism plot radius factor, which will be standardized as distance to the center of the tree: diameter at breast height. To ensure accurate measurements, the height of diameter at breast height (1.3 m) will be periodically re-assessed by personnel during the course of the inventory. Field crews will have fine scale forest strata maps for use in the field to precisely interpret strata/forest boundaries and identify potential areas of plot overlap.
2. Following measurement, a consistency check of an opportunistic sample of 5 points will be re-measured to determine measurement error. Re-measurement for this purpose will be done by a different field crew. Measurement error will be assessed as 1/2 of the mean (absolute) percent difference between re-measured plot level biomass estimates (a valid assumption where teams are equally experienced and there are no systematic errors in measurement, which will also be appraised from the re-measurement results). Target measurement error is < 5%. During the course of implementation, field crews will be periodically apprised of measurement errors to assess progress.
3. Field measurement data will be recorded on standard field data sheets included in “PROTOCOLOS DE CAMPO PARA LA MEDICIÓN Y MONITOREO DE LA BIOMASA FORESTAL EN LA RESERVA COSTERA VALDIVIANA.” Data will be entered from field sheets to an electronic database. Checks will be run for unusual (high or low) values to identify and correct any errors in recorded field data or transcription. Personnel involved in data

analysis will consult with personnel involved in measurement to clarify any ambiguities in recorded field data.

4. Data archiving: On each return from the field, field data sheets will be photocopied and originals archived with the TNC office in Chaihuin, with duplicate copies stored at the TNC office in Valdivia. The electronic database of all field measurements will be housed in the dedicated long-term electronic archive maintained on the TNC server at its office in Valdivia. The electronic database will also archive GIS coverages detailing forest and strata boundaries and plot locations.

Emissions due to biomass burning

Incidence of burned areas in the project area will be monitored consulting the CONAF fire database. Where points of fire incidence are discovered, the area subject to fire will be delineated and quantified using the same remote sensing analysis detailed above, using visual interpretation by an image analyst with knowledge of the land cover and/or with the assistance of high resolution imagery. Burned areas will be maintained as a separate category to calculate parameter $A_{burn,i,t}$ and for estimation of biomass burning emissions using the module E-BB – calculated emissions from biomass burning will be incorporated in project accounting only where they are not determined to be insignificant applying T-SIG.

Emissions due to illegal degradation

Because it is extremely sensitive to ask of community members explicit questions regarding timber harvest activities, precluding direct interviews with communities potentially carrying out these activities, potential for illegal degradation will instead be monitored via periodic patrols throughout the VCR area, including the project area, by six TNC park rangers and through periodic consultation the District Attorney's office (Fiscalía Regional) of the Ríos Region; the District Attorney's office is where all reports of illegal logging by any enforcement body are collected. Consultations will be conducted at least every 2 years, starting in 2012. VCR staff patrol observations and consultations with local authorities will provide general indications on incidents and areas where illegal wood harvest has occurred or may be occurring in or near the project area.

Rangers typically work ten-day shifts, with five days off for rest, with the exception of the coordinator and manager of community development work Monday through Friday. The VCR administrator meets annually with the ranger team to develop annual work plan based on the VCR management plan. The coordinator, according to the annual work plan provides that each ranger activities must meet during their shift and ensures that these are met. Rangers' responsibilities include control and monitoring, forest fire prevention, environmental education, monitoring threats, wildlife monitoring, and community development.

The primary operations center for the park rangers is in Chaihuin. Patrols prioritize key access points/areas of activity, particularly in the areas of Colun, Chaihuin and the route from Hueicolla to La Union (Rts 470 and 80), the latter area in coordination with CONAF personnel posted at a permanent guard station at the national park near the reserve entrance.

Notwithstanding the priority areas identified above, guard patrols are deployed according to continuous re-assessments of threats, which may change in nature and location seasonally. Monthly meetings of park guards are held to assess current threats and using a planning grid of the reserve, select priority 100 ha grid areas for patrols on the basis of accessibility and threats. Monthly, 4 grids, covering an area of 400 ha, are investigated. Guards carry out patrols on foot, on motorcycles and in pickup trucks. Twenty camera traps are also deployed in priority areas to aid in monitoring threats. When incidents are encountered, guards will record details regarding the incident on standardized forms, including the location using GPS. In the case of illegal logging encountered, guards will specify the species and volume (cubic meters) extracted, and whether there was any contact with the persons involved. While in the field, guards maintain radio contact with the reserve administration office in Chaihuin, to which incidents are also relayed immediately by radio.

In the event that any potential of illegal logging in the project area is detected, the area indicated will be delineated ($A_{DegW,i}$) and temporary sample plots will be allocated and measured in the area. Rectangular plots 10 meters by 1 kilometer (1 ha area) will be randomly or systematically allocated in the area, sufficient to produce a 1% sample of the area, and any recently-cut stumps or other indications of illegal harvest will be noted and recorded. Diameter at breast height, or diameter at height of cut, whichever is lower, of cut stumps will be measured. Where potential emissions as determined through this assessment are determined to be insignificant using tool T-SIG, no further monitoring will be conducted and emissions from illegal logging will be assumed to be zero.

In the event that the sample plot assessment indicated that illegal logging is occurring in the area and is potentially significant, supplemental plots will be allocated systematically to achieve a 3% sample of the area. Biomass will be estimated from measured diameters (conservatively assuming that diameters of stumps cut below breast height are equivalent to diameter at breast height) applying allometric equations of Gayoso et al., (2002) and otherwise maintain consistency with analytical procedures applied in the original 2011 inventory. Emissions due to illegal logging ($\Delta C_{P,DegW,i,t}$) are estimated by multiplying area ($A_{DegW,i}$) by average biomass carbon of trees cut and removed per unit area ($C_{DegW,i,t} / AP_i$).

The more intensive 3% sample will be carried out once every 5 years where surveys and limited sampling continue to indicate possibility of illegal logging in the project area to produce an estimate of emissions resulting from illegal logging ($\Delta C_{P,DegW,i}$). Estimates of emissions will be annualized (to produce estimates in t CO₂-e per year) by dividing the emission for the monitoring interval by the number of years in the interval.

Monitoring of leakage carbon stock changes and greenhouse gas emissions

Two sources of leakage will be monitored: activity shifting leakage and market leakage.

Activity-shifting leakage

Activity shifting leakage due to displaced road construction

Activity shifting leakage due to road construction by the MOP will be monitored in a defined north-south corridor, thus capturing any alternative routes to the Carretera Costera. The effective baseline rate for this corridor is set to zero, and hence any deforestation resulting from road construction meeting the criteria defined below will be treated as leakage.

The parameter *NewR*, new calculated planned forest clearance by the baseline agent where no leakage is occurring, is set to zero. The Carretera Costera was intended to be a major highway for scenic and commercial purposes, generally running from north to south through the Reserve, though with some east-west variation in direction, to account for topography and connection of existing points of habitation and local roads. As such, the defined leakage zone is intended to capture deforestation resulting within an area where an alternative highway could be constructed after the project start date. Parameter *NewR*, and parameter *A_{defLK}*, monitored area of planned deforestation by the baseline agent, are further specified to refer to deforestation from any highways in Region XIV within the leakage zone, which is defined as the area bounded by 1) the coast on the west, 2) the existing north-south highway Rt. 5 on the east, 3) the coastline from the town of Corral to Rt 207 on the north, and 4) the Rio Bueno on the south (representing the southernmost border of the Reserve), by the MOP after the project start date. (Figure 4.1).

New road construction meeting the criteria detailed above will be identified by consulting MOP construction records and/or current road maps.

Area of deforestation along the road construction identified above will be determined with remotely-sensed imagery. When using remotely-sensed imagery, imagery that is freely available and accessible using Google Earth will be used preferentially when it is available. When it is unavailable, other remotely sensed imagery will be acquired for analysis.

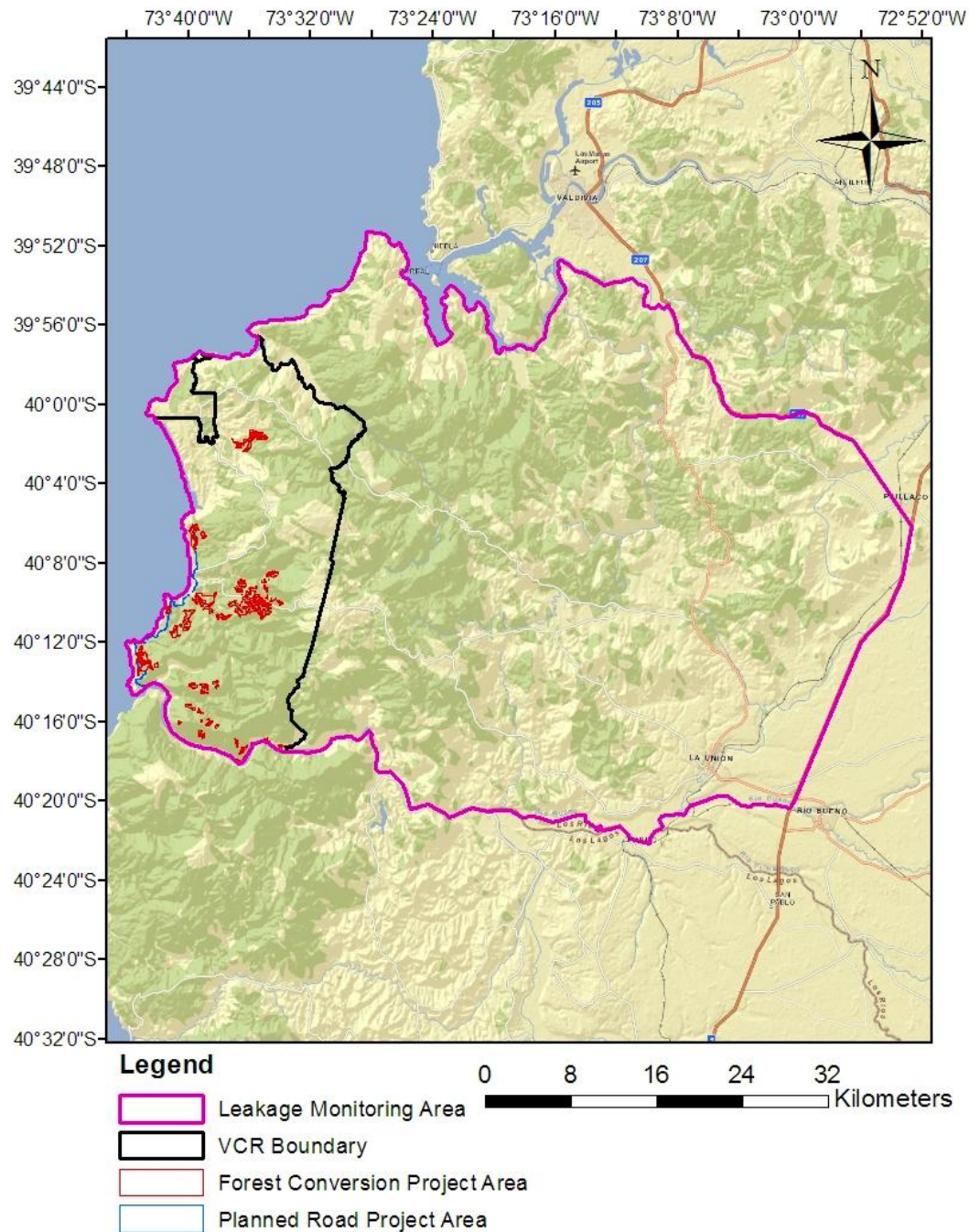


Figure 4.1. Leakage zone in which deforestation resulting from new road construction/improvement by the MOP is monitored.

Organization and Responsibilities

Responsibility for carrying out future monitoring resides within TNC's Chile chapter, lead by the S. Andes Director, though implementation of monitoring activities will be delegated to staff within the Reserve. TNC Chile staff have expertise in the areas of biological monitoring, forest engineering and Geographic Information Systems, but will contract with external experts as required, in the area of forest biometrics, remote sensing, and the like. Biomass inventory may be contracted to external experts and field crews, should this be required. See Table 1.1 for more detail.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

Baseline emissions for the project activities (stopping conversion of native forest to Eucalyptus plantations and stopping highway construction) for project years 2015 to 2023, are summed in Table 5.1 below (derived from updated baseline detailed in the Project Description Appendix 1). There is no deforested area in the baseline scenario during the monitoring period. All baseline emissions result from the continued degradation of belowground biomass, dead wood, and emissions from harvested wood products, calculated from the project start. Full equations and calculations for baseline emissions are documented in the emission reduction and removal calculation spreadsheet, 'VCR NER calcs 2015_2023.xlsx'.

Table 5.1. Total baseline emissions.

Years	$\Delta C_{BSL,planned, Euc}$ tCO ₂ e	$\Delta C_{BSL,planned, road}$ tCO ₂ e	Total $\Delta C_{BSL,planned}$ tCO ₂ e
2015	5,165	1,899	7,065
2016	3,383	1,384	4,768
2017	803	1,368	2,171
2018	0	1,146	1,146
2019	0	1,062	1,062
2020	0	653	653

2021	0	190	190
2022	0	163	163
2023	0	97	97
Total	26,035	9,862	35,896

Note: the year refers to the year at the end of the annual interval, hence 2015 represents the year from 4 November 2014 to 3 November 2015.

5.2 Project Emissions

Equation 1 of module M-REDD (VMD0015 v2.1) of Methodology VM0007 is applied to calculate Project Emissions.

$$\Delta C_P = \sum_{t=1}^{t^*} \sum_{i=1}^M (\Delta C_{P,DefPA,i,t} + \Delta C_{P,Def,i,t} + \Delta C_{P,DistPA,i,t} + GHG_{P-E,i,t} - \Delta C_{P,Enh,i,t})$$

Equation 1, VMD0015

Table 5.2 Equation for Calculating the Net GHG emissions within the Project Area under the Project Scenario.

Parameter	Description	Value	Justification
ΔC_P	Net greenhouse gas emissions within the project area under the project scenario; t CO ₂ e	$\Delta C_P = 0$	Calculated below. See Table 5.7.
$\Delta C_{P,DefPA,i,t}$	Net carbon stock change as a result of deforestation in the project area in the project case in stratum i at time t; t CO ₂ e	$\Delta C_{P,DefPA,i,t} = 0$	Calculated below. See Table 5.7.

$\Delta C_{P,Deg,i,t}$	Net carbon stock change as a result of degradation in the project area in the project case in stratum i at time t; t CO ₂ e	$\Delta C_{P,Deg,i,t} = 0$	Calculated below. See Table 5.7.
$\Delta C_{P,DistPA,i,t}$	Net carbon stock change as a result of natural disturbance in the project area in the project case in stratum i at time t; t CO ₂ e	$\Delta C_{P,DistPA,i,t} = 0$	Calculated below. See Table 5.7.
$GHG_{P-E,i,t}$	Greenhouse gas emissions as a result of deforestation and degradation activities within the project area in the project case in stratum i in year t; t CO ₂ e	$GHG_{P-E,i,t} = 0$	Calculated below.
$\Delta C_{P,Enh,i,t}$	Net carbon stock change as a result of forest growth and sequestration during the project in areas projected to be deforested in the baseline in stratum i at time t; t CO ₂ e	$\Delta C_{P,Enh,i,t} = 0$	Conservative to exclude.

Full equations and calculations for project emissions are documented in the emission reduction and removal calculation spreadsheet, 'VCR NER calcs 2015_2023.xlsx'.

Monitoring areas undergoing deforestation

From analysis of forest cover change from the classified imagery no forest cover loss occurred in the project area from 2014 to 2023 (see Appendix 2). Project emissions from deforestation are calculated as the total area deforested multiplied by the emission per unit area using Equation 3, from Module VMD0015.

$$\Delta C_{P,DefPA,i,t} = \sum_{u=1}^U (A_{DefPA,u,i,t} * \Delta C_{pools,P,Def,u,i,t})$$

Equation 3, Module VMD0015.

Table 5.3 Parameters used to calculate $\Delta C_{P,DefPA,i,t}$

Parameter	Description	Value
$A_{DefPA,u,i,t}$ (ha)	Area of recorded deforestation in the project area stratum i converted to land use u at time t ; ha	Calculated in imagery analysis
$\Delta C_{pools,Def,u,i,t}$	Net carbon stock changes in all pools in the project case in land use u in stratum i at time t ; t CO ₂ -e ha ⁻¹	Calculated below

As per the monitoring plan, changes in forest cover detected for the monitoring interval (2015-2023) were annualized (to produce estimates of ha for each year) by dividing the area by the number of years in the period (9).

Table 5.4 $A_{DefPA,u,i,t}$ (ha)

	$A_{DefPA,u,i,t}$ (ha)			
	Native Forest	Euc plantation est 1990	Euc plantation est 1991	TOTAL
2015	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0

Calculation of emission per unit area is equal to the difference between the stocks before and after deforestation, applying Equation 5 in Module VMD0015

$$\Delta C_{pools,Def,i,t} = C_{BSL,i} - C_{P,post,i} - C_{WP,i}$$

Table 5.5 Parameters used to calculate $\Delta C_{pools,Def,u,i,t}$

Parameter	Description	Value
$C_{BSL,i}$	Carbon stock in all pools in the baseline case in stratum	Calculated from forest inventory results (PD section 3)
$C_{P,post,u,i}$	Carbon stock in all pools in post-deforestation land use u in stratum i; t CO2-e ha-1	Assumed to be zero

Table 5.6
 $\Delta C_{P,DefPA,i,t}$ (t CO2)

	$\Delta C_{P,DefPA,i,t}$ (t CO2)			
	Native Forest	Euc plantation est 1990	Euc plantation est 1991	Total $\Delta C_{P,DefPA,i,t}$
2015	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0

Monitoring biomass burning

Carbon emissions are also generated in the project scenario through potential biomass burning occurring within the project boundaries, applying Equation 30 in VMD0015:

$$GHG_{P,E,i,t} = E_{FC,i,t} + E_{BiomassBurn,i,t} + N_2O_{direct-N,i,t}$$

Parameter	Description	Value
-----------	-------------	-------

$GHG_{P,E,i,t}$	Greenhouse gas emissions as a result of deforestation activities within the project area in the project case in stratum i in year t ; tCO_{2e}	
$E_{FC,i,t}$	Emission from fossil fuel combustion in stratum i within the project area in year t ; $t CO_{2-e}$	Conservatively excluded
$E_{BiomassBurn,i,t}$	Non-CO2 emissions due to biomass burning in stratum i in year t ; $t CO_{2-e}$	0 No forest fires took place in the project area during the monitoring period. See below.
$N_2O_{direct-N,i,t}$	Direct N_2O emission as a result of nitrogen application on the alternative land use in stratum i within the project area in year t ; $t CO_{2-e}$	N/A

Based on CONAF fire database, no forest fires (> 0.1 ha) were detected within the project area during the period 2014-2023 (Figure 5.1. CONAF records archived with project monitoring report submission).

The reserve, including the project area, is a priority area for CONAF's fire prevention and control activities, and is routinely patrolled, in close coordination with reserve guardaparques, and monitored from a fire observation tower near Chaihuin close to the project area.

Furthermore, in the classification process of the 2023 imagery, no evidence of fire scars was detected, nor were fires reported from the project area by park guard patrols over the 2014-2023 period. Therefore, for the current monitoring period, $A_{burn,i,t}$ was 0 and emissions from biomass burning are equal to zero.

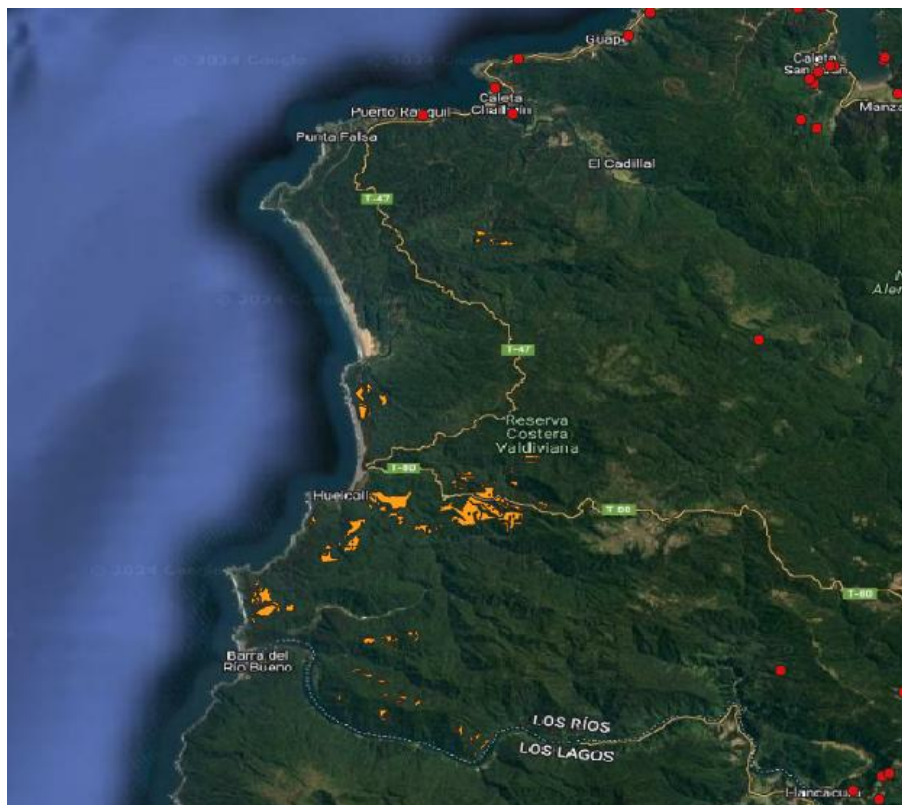


Figure 5.1. Forest fires (> 0.1 ha) detected by CONAF during the period 2014-2023 (red circles) mapped with the project area (orange).

Monitoring illegal logging

Continuous monitoring activities in the field by park guards through the monitoring period identified no illegal logging activities in the project area since November 2014, confirmed by park guards (see attestation from the VCR Coordinador de Guardaparques, “sin cortas ilegales.pdf”) and documented in patrol logs.

Infractions of illegal logging in the region are rare due to remote access and difficulty of transport and strong enforcement by CONAF. The project area in particular is remote with no access by primary roads.

Net project emissions within the project area calculated in Table 5.7.

Table 5.7 ΔCP (t CO₂-e)

	$\Delta CP, DefPA, i, t$	$\Delta CP, Deg, i, t$	$\Delta CP, DistPA, i, t$	ΔCP
2015	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0

2018	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	0.0
2020	0.0	0.0	0.0	0.0
2021	0.0	0.0	0.0	0.0
2022	0.0	0.0	0.0	0.0
2023	0.0	0.0	0.0	0.0
Total	0.0	0.0	0.0	0.0

5.3 Leakage Emissions

Leakage emissions from displacement of planned deforestation are estimated in conformance with the VCS modular REDD methodology VM0007, specifically the LK-ME module (VMD0011 v1.1). This module estimates GHG emissions caused by the market-effects leakage related to extraction of wood for timber. No activity shifting leakage took place during the monitoring period, as described below.

Activity shifting leakage

Activity shifting leakage due to displaced road construction

No activity shifting leakage was detected from Nov 2014 to Nov 2023. The project proponent is not aware of new road construction meeting the criteria as defined in the monitoring plan occurring over the monitoring period, nor is any evident in satellite monitoring covering the leakage belt reported by FORECOS (pp. 7-9 in “Informe Custodia de Conservacion 2022-23 Reserva Costera Valdiviana.doc”).

Activity shifting leakage due to displaced forest conversion activities

No native forest conversion to plantations takes place in the baseline after 2008, thus activity shifting leakage from this source is equal to zero. Even any delayed displacement of these activities is precluded, due to the Native Forest Law in effect through the monitoring period; the Native Forest Law (Law 20.283/2008) prohibits conversion of native forests to non-native plantations.

Market leakage

Market leakage ($\Delta CLK-ME$) is equal to the sum of market effects leakage through decreased timber harvest ($LK_{MarketEffects,timber}$), decreased harvest for fuelwood / charcoal production ($LK_{MarketEffects,FW/C}$), and peatland drainage for fuelwood and charcoal harvest. As there is no fuelwood or charcoal collection by the baseline agent of deforestation, market leakage is limited to leakage through decreased timber harvest as calculated in Equation 2 of VMD0011:

$$\Delta C_{LK-ME} = LK_{MarketEffects,timber} = \sum_{i=1}^M (LF_{ME} \times LK_{MAF} \times AL_{T,i})$$

Table 5.8 Parameters and values used to estimate market leakage

Parameter	Description	Value	Justification
-----------	-------------	-------	---------------

LK _{MarketEffects,timber}	Total GHG emissions due to market-effects leakage through decreased timber harvest (t CO _{2e}).	See Table 5.14	Calculated below.
LF _{ME}	Leakage factor for market-effects calculations (dimensionless)	0.4	See Table 5.13 below.
LK _{MAF}	Leakage management adjustment factor (dimensionless)	N/A	N/A
AL _{T,i}	Summed emissions from timber harvest in stratum i in the baseline case potentially displaced through implementation of the project (tCO _{2e})	85,495.4 tCO _{2e}	See Table 5.14 below.

Full equations and calculations for market leakage are documented in the emission reduction and removal calculation spreadsheet, 'VCR NER calcs 2015_2023.xlsx'.

Market leakage due displaced timber production within the road clearance area

There is no displacement of timber production within the road clearance area during the current monitoring period 2015-2023, because the last Eucalyptus harvest in the road clearance area in the baseline took place in project year 2012, thus there is no market leakage from this source in project years 2013 on.

Market leakage due to displaced forest conversion activities

No market leakage occurs as a result of the stop conversion to plantations activity until 2019, the year of the first commercial wood harvest potentially displaced by the project. Volume production in the baseline for the monitoring dates from 2019 to 2023, was calculated at baseline renewal in 2013 (for accounting of market leakage in subsequent monitoring periods). Volume projections in the second baseline period are detailed in Appendix 1 to the Project Description (PD), and repeated below.

Market leakage incorporates volumes extracted in the baseline scenario, estimated ex ante and detailed below. Harvests are from Eucalyptus plantations established through conversion of native forest in the project area in the first baseline period.

Plantations are managed on 15 year rotations, and the first commercial wood harvest potentially displaced by the project takes place in 2019 (for plantations established in 2004), as explained in the VCS Project Document.

Market leakage for this component is estimated (for project years from 2019 to 2023) using the extraction volumes detailed below. All assumptions are consistent with those derived and justified in Section 3.1 of the PD. Establishment dates are derived from Table 3.11b of the PD, and yields at harvest assume a 15 year rotation and mean annual increment (MAI) of 16.2 m³/ha/yr, derived in Table 3.16 of the PD (referencing data from Inventario Forestal Empresas TNC. 2007. The Nature Conservancy).

Table 5.9. Baseline harvests in Eucalyptus plantations maturing over the 2015-2023 monitoring period.

Year established	harvests	ha	Volume m ³ extracted from the project area in the baseline
N/A	2015	0	-
N/A	2016	0	-
N/A	2017	0	-
N/A	2018	0	-
2004	2019	475.4	115,524
2005	2020	491.3	119,383
2006	2021	76.0	18,470
2007	2022	110.1	26,746
2008	2023	34.2	8,322

In Chile, not all of the extracted volumes are driven by domestic market demand and consumption. As market leakage references decreased timber harvest for sale to national markets, as defined in module VMD0011 LK-ME of methodology VM0007, we first sought to determine the amount of domestic production of *Eucalyptus globulus* managed on pulp rotations that would be destined for domestic (not export) markets by consulting national forest statistics published by the Instituto Forestal (INFOR). Data were available for 2019 to 2022 (INFOR 2020-2023) and are presented in Tables 5.10 and 5.11.

Table 5.10. INFOR Eucalyptus production data in thousands of cubic meters from INFOR Anuarios 2020-2023, FLUJO DE PRODUCTOS FORESTALES EN LA INDUSTRIA PRIMARIA - EUCALIPTO)". Conversion of pulp green tons to cubic meters assumes 50% moisture content and 0.5 g/cm³ wood specific gravity.

Años	pulp t	pulp m ³	sawnwood m ³	chips m ³	panels and veneers m ³	posts and poles m ³	total m ³
2019	2,581,440	2,581,440	6,556	6,641,143	149,202	2,175	9,380,516
2020	2,727,720	2,727,720	4,722	5,927,034	240,051	1,548	8,901,075
2021	2,454,922	2,454,922	3,979	5,105,120	242,582	581	7,807,184
2022	2,180,809	2,180,809	8,318	4,180,724	239,920	290	6,610,061

FUENTE: (INFOR, 2020-2023)³⁶.

Table 5.11. INFOR Eucalyptus percent production destined for export data from INFOR Anuarios 2020-2023, FLUJO DE PRODUCTOS FORESTALES EN LA INDUSTRIA PRIMARIA - EUCALIPTO)".

Años	pulp t	pulp m ³	sawnwood m ³	chips m ³	panels and veneers m ³	posts and poles m ³	Volume-weighted average (export)	Volume-weighted average (domestic)
2019		89%	22%	83%	6%	0%	83%	17%
2020		83%	41%	82%	12%	0%	80%	20%
2021		91%	37%	77%	6%	0%	79%	21%
2022		86%	16%	71%	11%	0%	74%	26%
						overall	80%	20%

FUENTE: (INFOR, 2020-2023)³⁷.

Average percent of domestic Eucalyptus production (on a volume-weighted basis) sold to export markets from 2019-2022 was 80%, with the inverse (20%) sold to domestic markets. For calculations of market leakage, extracted volumes were multiplied by the annual average percent of production destined for domestic markets (the overall average for the 2019-2022 period was applied to 2023, for which INFOR data was not yet available) (Table 5.12). This treatment conforms with guidance set out in VCS Standard section 3.15.11 "Leakage occurring outside the host country (international leakage) does not need to be

³⁶ INFOR, 2020. Anuario Forestal 2020. Boletín estadístico N° 174. Ministerio de Agricultura, INFOR. Santiago, Chile. 274 pp.
INFOR, 2021. Anuario Forestal 2021. Boletín estadístico N° 180. Ministerio de Agricultura, INFOR. Santiago, Chile. 274 pp.
INFOR, 2022. Anuario Forestal 2022. Boletín estadístico N° 187. Ministerio de Agricultura, INFOR. Santiago, Chile. 280 pp.
INFOR, 2023. Anuario Forestal 2023. Boletín estadístico N° 192. Ministerio de Agricultura, INFOR. Santiago, Chile. 280 pp.

³⁷ INFOR, 2020. Anuario Forestal 2020. Boletín estadístico N° 174. Ministerio de Agricultura, INFOR. Santiago, Chile. 274 pp.
INFOR, 2021. Anuario Forestal 2021. Boletín estadístico N° 180. Ministerio de Agricultura, INFOR. Santiago, Chile. 274 pp.
INFOR, 2022. Anuario Forestal 2022. Boletín estadístico N° 187. Ministerio de Agricultura, INFOR. Santiago, Chile. 280 pp.
INFOR, 2023. Anuario Forestal 2023. Boletín estadístico N° 192. Ministerio de Agricultura, INFOR. Santiago, Chile. 280 pp.

quantified”, and reflected in module LK-ME “As per the VCS AFOLU requirements international market leakage is not considered.”

Table 5.13. Projected volumes of wood products extracted from *Eucalyptus globulus* plantations from the project area and entering domestic markets.

Year	Eucalyptus extracted m ³	% destined for national markets	Eucalyptus extracted that enters domestic markets m ³
2015	0.0		0.0
2016	0.0		0.0
2017	0.0		0.0
2018	0.0		0.0
2019	115,523.9	17%	19217.9
2020	119,383.4	20%	23419.9
2021	18,470.3	21%	3847.4
2022	26,746.2	26%	7034.6
2023	8,322.2	20%	1697.9

All of the above estimated volumes of *Eucalyptus* extracted that enter domestic markets are potentially displaced, because no timber harvest takes place in the project area in the with-project scenario.

The market leakage factor, LF_{ME} , used is 0.4, where mean merchantable biomass as a proportion of total aboveground tree biomass in forests to which harvest would be displaced is equal to merchantable biomass as a proportion of total aboveground tree biomass within the project boundary. This value is justified because the commercial component of aboveground tree structure in the project area (*Eucalyptus globulus* plantations) will be nearly identical to areas where harvest could be displaced in Chile to make up for reduction in supply of *Eucalyptus globulus* wood (i.e. other *Eucalyptus globulus* plantations).

The value of parameter D_{mn} (mean wood density of commercially harvested species), 0.5; wood specific gravity of *E globulus* reported in the IPCC 2006GL. A default carbon fraction of biomass of 0.47 is applied for parameter CF (IPCC 2006GL).

Parameters for calculation of market leakage from displaced timber production are summarized below.

Table 5.13. Parameters for calculation of market leakage

Parameter	Value	Source
D_{mn}	0.5	IPCC 2006GL

LF _{ME}	0.4	Justified above
CF	0.47	IPCC 2006GL
LDF	0.25	Default value for coniferous forests from methodology VM0007. Although Eucalypts are not conifers, their growth form is closer to conifers than deciduous or hardwood species, with a predominant stem (with bark) component representing 71% of aboveground biomass ³⁸ , particularly in plantation grown settings as in the project area.
LIF	0.29	Default value from methodology VM0007

Calculations of market leakage from displaced timber production are summarized below and in “VCR NER calcs 2015_2023.xlsx”). Total leakage due to market effects from displaced timber production over the 2015-2023 period is 34,198.2 t CO₂ (Table 5.14).

Table 5.14. Market leakage calculation

Year	$V_{BSL,EX,t}$	$C_{BSL,XBT,i,t}$	$LK_{MarketEffects,timber,t}$
	m ³	t CO ₂	t CO ₂
2015	-	-	-
2016	-	-	-
2017	-	-	-
2018	-	-	-
2019	19,217.9	29,755.7	11,902.3
2020	23,419.9	36,261.8	14,504.7
2021	3,847.4	5,957.0	2,382.8
2022	7,034.6	10,891.9	4,356.8
2023	1,697.9	2,629.0	1,051.6
		$AL_T = 85,495.4$	$LK_{MarketEffects,timber} = 34,198.2$

Total leakage for the project as a whole, including both activities (stopping conversion of native forest to Eucalyptus plantations and stopping highway construction) was summed in Table 5.15 below.

Table 5.15. Calculation of total leakage.

Year	$\Delta C_{LK-AS,planned,road}$	$\Delta C_{LK-AS,planned,Euc}$	$\Delta C_{LK-ME,road}$	$\Delta C_{LK-ME,Euc}$	ΔC_{LK}
------	---------------------------------	--------------------------------	-------------------------	------------------------	-----------------

³⁸ Gayoso, J. 2008a. Eucalyptus sp. Resultados Proyecto FONDEF D98i1076

2015	0.0	0.0	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0	0.0
2017	0.0	0.0	0.0	0.0	0.0
2018	0.0	0.0	0.0	0.0	0.0
2019	0.0	0.0	0.0	11,902.3	11,902.3
2020	0.0	0.0	0.0	14,504.7	14,504.7
2021	0.0	0.0	0.0	2,382.8	2,382.8
2022	0.0	0.0	0.0	4,356.8	4,356.8
2023	0.0	0.0	0.0	1,051.6	1,051.6
Total	0	0	0	34,198.2	34,198.2

5.4 GHG Emission Reductions and Carbon Dioxide Removals

Uncertainty

Uncertainty was assessed applying module X-UNC.

Uncertainty in the baseline rate, parameter $Uncertainty_{BSL,RATE}$, is equal to zero. Per X-UNC, “Where an uncertainty value is not known or cannot be simply calculated, then a project must justify that it is using an indisputably conservative number and an uncertainty of 0% may be used for this component.”

Uncertainty of 0% is applied to the rate of deforestation associated with road construction in the baseline, which cannot be calculated and has been clearly demonstrated to be conservative (VCS PD Section 3.1). Uncertainty in the baseline rate of deforestation associated with the conversion of native forest to plantations is also assumed to be zero “where the planned deforestation rate is based on actual deforestation plans” (per X-UNC), as it is for this component of the baseline, based on CONAF permits and management plans.

Total uncertainty in carbon stocks in native forest (parameter $Uncertainty_{BSL,SS}$) is equal to combined uncertainty of forest carbon pool stock estimates, calculated using propagation of errors (equation 4 of VM0007 module X-UNC). Parameter $Uncertainty_{BSL,SS}$ is thus calculated to be 8% at the 95% confidence level (calculations detailed in VCS PD Annex 1 2011 Forest Biomass Inventory Results for Valdivian Coastal Reserve).

Results of overall uncertainty calculations are presented in Table 5.16.

Table 5.16. Summary of uncertainty calculations.

X-UNC eq #	5	3	6	10	11
Parameter	Uncertainty _{BSL,S}	Uncertainty _{BSL,R} ATE,	Uncertainty _{BSL,t} *	C _{REDD_ERROR,t} *	Adjustment factor applied to C _{REDD,t} *
value	8%	0%	8%	8%	100%

Summary of net emission reduction calculations

Estimates of GHG credits eligible for issuance as VCU's for the project as a whole, including both activities (stopping conversion of native forest to Eucalyptus plantations and stopping highway construction), were calculated entering data into Table 5.17 below, where

Estimated GHG emission reduction credits =

Baseline emissions minus

Project emissions minus

Leakage minus

Non-permanence Risk Buffer withholding (calculated as a percent of net change in carbon stocks prior to deduction of leakage)

State the non-permanence risk rating (%)	12%
Has the non-permanence risk report been attached as either an appendix or a separate document?	☒ Yes ☐ No
State, in tCO _{2e} , the expected total GHG benefit to date.	-18,962 tCO _{2e} during monitoring period 576,853 tCO _{2e} during project lifetime
If a loss occurred (including a loss event or reversal), state the amount of tCO _{2e} lost:	No loss event

Table 5.17. Summary of net emission reduction calculations.

Vintage period	Baseline emissions (tCO _{2e})	Project emissions (tCO _{2e})	Leakage emissions (tCO _{2e})	Buffer pool allocation (tCO _{2e})	Reductions VCU's (tCO _{2e})	Removals VCU's (tCO _{2e})	Total VCU issuance (tCO _{2e})
----------------	---	--	--	---	---------------------------------------	-------------------------------------	---

04-Nov-2014 to 31-Dec-2014	1,123	0	0	135	988	0	988
01-Jan-2015 to 31-Dec-2015	6,700	0	0	804	5,896	0	5,896
01-Jan-2016 to 31-Dec-2016	4,355	0	0	523	3,832	0	3,832
01-Jan-2017 to 31-Dec-2017	2,008	0	0	241	1,767	0	1,767
01-Jan-2018 to 31-Dec-2018	1,132	0	1,891	136	-895	0	-895
01-Jan-2019 to 31-Dec-2019	997	0	12,316	120	-11,439	0	-11,439
01-Jan-2020 to 31-Dec-2020	579	0	12,578	70	-12,069	0	-12,069
01-Jan-2021 to 31-Dec-2021	186	0	2,696	22	-2,533	0	-2,533
01-Jan-2022 to 31-Dec-2022	153	0	3,832	18	-3,697	0	-3,697
01-Jan-2023 to 31-Dec-2023	81	0	884	10	-813	0	-813
Total	17,314	0	34,198	2,078	-18,962	0	-18,962

Table 5.18 Estimated ex-ante GHG emission reductions and carbon dioxide removals and the achieved reductions and removals for the monitoring period. The quantities of reductions and removals are the total quantities before any deductions for buffer credits.

Vintage period	Ex-ante estimated reductions/removals	Achieved reductions/removals	Percent difference	Explanation for the difference
04-Nov-2014 to 31-Dec-2014	1,123	1,123	0%	
01-Jan-2015 to 31-Dec-2015	6,700	6,700	0%	
01-Jan-2016 to 31-Dec-2016	4,355	4,355	0%	
01-Jan-2017 to 31-Dec-2017	2,008	2,008	0%	
01-Jan-2018 to 31-Dec-2018	(334)	(759)	128%	Increase in domestic market leakage
01-Jan-2019 to 31-Dec-2019	(8,277)	(11,319)	37%	Increase in domestic market leakage
01-Jan-2020 to 31-Dec-2020	(7,673)	(11,999)	56%	Increase in domestic market leakage
01-Jan-2021 to 31-Dec-2021	(1,394)	(2,511)	80%	Increase in domestic market leakage
01-Jan-2022 to 31-Dec-2022	(1,659)	(3,679)	122%	Increase in domestic market leakage
01-Jan-2023 to 31-Dec-2023	(568)	(803)	41%	Increase in domestic market leakage
Total	(5,719)	(16,884)	195%	Increase in domestic market leakage

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

No commercially-sensitive information is included in this monitoring report.

APPENDIX 2: MONITORING CHANGE IN FOREST COVER 2014-2023

Classification

To complete the classification, Landsat 9 collection 2 level 1 imagery (path 233, row 088) was downloaded from USGS Earth Explorer. The most cloud-free and recent imagery data was obtained (collection date of October 17th, 2023). No clouds were present in the project region portion of the scene. Collection 2 Level-1 Landsat data includes many data pre-processing improvements including advances geometric and radiometric corrections quality of and therefore no additional pre-processing steps were required³⁹.

In QGIS a virtual layer combining all 10 bands of the Landsat imagery was input into the K-means Clustering raster tool, which produces an unsupervised cluster-based classification using a parameter of 10 classes. The 10 resulting classes were then reclassified into Forest, Non-forest, and Water categories. The classification region is shown in Figure A1 below.

³⁹ [USGS Landsat product information](#)

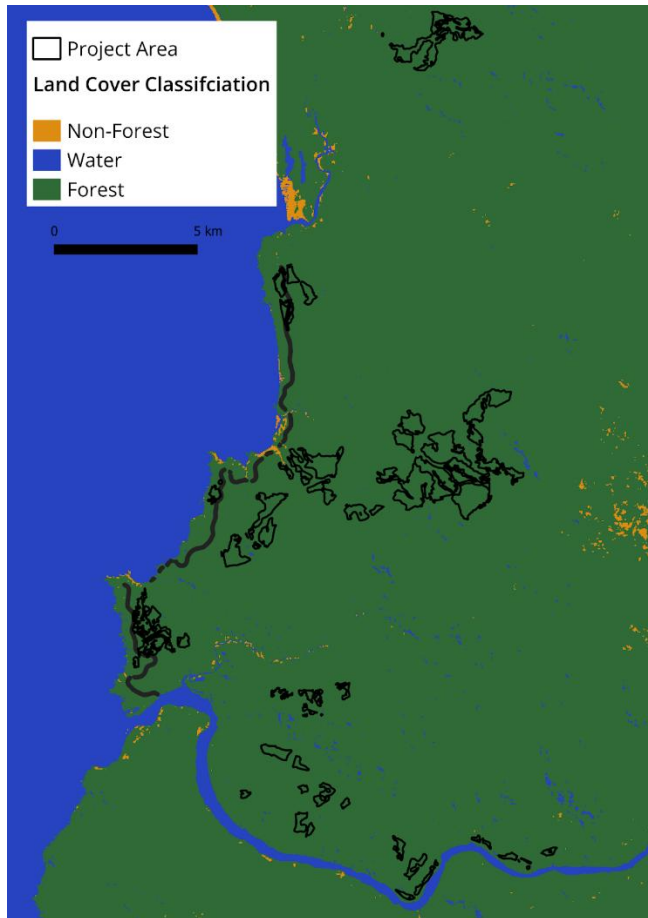


Figure A1. Classification of Valdivia project region

An accuracy assessment was conducted using a random sample of 100 points from both the F and NF classes which were then reviewed using high-resolution 2023 Google Earth imagery to identify the ground truth. Overall map accuracy was 93.5%. The overall accuracy outcome must be 90% or more, therefore no non-conformity was identified.

Table A1. Accuracy assessment confusion matrix

Unsupervised Classification				
Land Cover Type	Forest	Non-Forest	User's Accuracy	Overall Accuracy

Forest	100	0	100%	93.5%
Non-Forest	13	87	87%	
Producer's Accuracy	87%	100%		

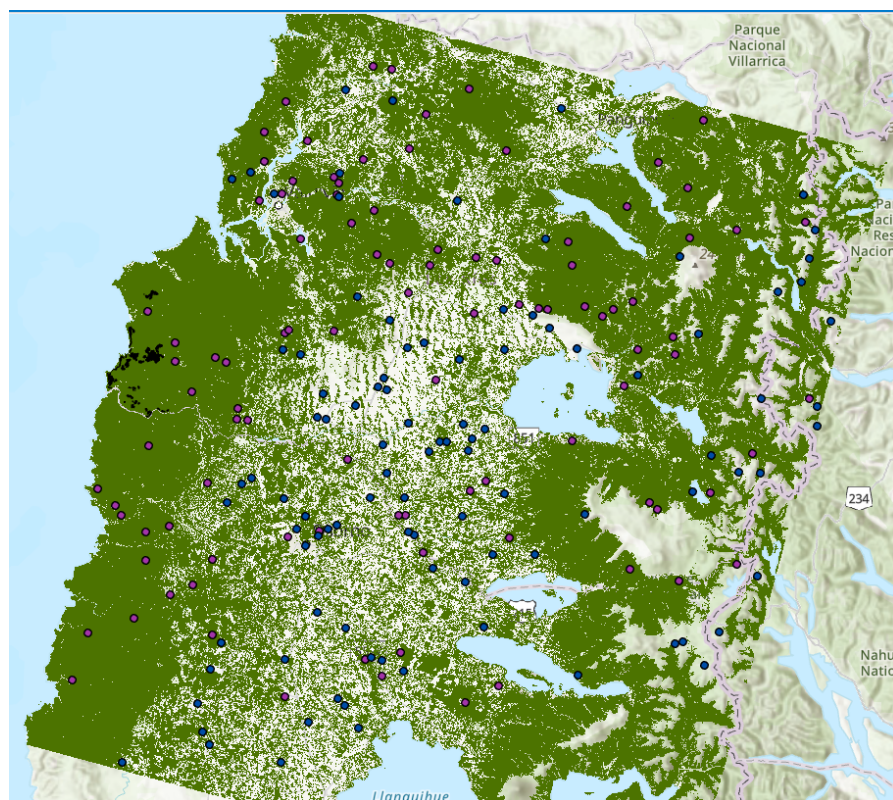


Figure A2. Distribution of AA points across region.

No forest loss was observed in the project area. Forest area in the project in 2023 is 1,273 ha*

ADefPA,u,i,t= 0

*Note that some loss was included in the previous monitoring report but this was determined to be caused by land cover misclassification. No forest loss was detected in this analysis and further the original project area was all determined to be forest.

APPENDIX 3: STAKEHOLDER INFORMATION

A3.1 Stakeholder Identification

Prior to the purchase of the VCR, several studies were conducted to identify the Community Groups and to diagnose their situation and the principal activities in the sector around the VCR, and to evaluate the impact of projects like the Coastal Highway (Godoy 2003a, 2003b). These anthropological studies were funded by WWF, and were participatory, allowing community members to identify the issues that they perceived as important in their region. As a result of these studies, the five Community Groups described in the next section (G1.6) were selected based on their proximity to the VCR as well as their relative dependence on the natural resources in the area.

The following three studies were the most important in informing stakeholder identification and project development:

1. Informe Diagnostico Social Localidades Costeras Provincia de Valdivia, Comunas de Corral y La Union by Marcelo Godoy Gallardo, April 2003.
2. Informe Diagnostico Comunidad Mapuche Huilliche de Huiro by Marcelo Godoy Gallardo, November 2003.
3. Caracterización Preliminar de los Predios Chaihuín-Venecia, Cordillera de la Costa Décima Región, by Aldo Farías, David Tecklin, WWF Chile, November 2003.

The first study listed, *Informe Diagnostico Social Localidades Costeras Provincia de Valdivia, Comunas de Corral y La Union* by Marcelo Godoy Gallardo is a comprehensive study of the socio-economic situation of communities in the two communes. The study methodology involved a review of existing primary and secondary literature as well as interviews with representatives of local government, community organizations, and randomly targeted community members. The study surveyed local organizations and leaders, production systems and local economic activities, programs and projects (completed and in progress), and local natural resources and forest uses.

In addition, Godoy provides a description of the property rights situation, noting a number of conflicts between communities and companies (empresas) in the 1980s, along with an explanation of how these issues were addressed. According to Godoy, generally speaking, claims to land are not considered to be ancestral and individuals have private land titles. The study highlights the distinction between the towns of Corral, which is more remote and rural and La Union which was experiencing some industrial and commercial development. Out-migration to urban areas for employment and educational

opportunities was also noted. In both communes, logging of the forests was a significant ongoing enterprise, while coastal populations depended heavily on fishing, supplemented by collection of non-timber forest products, livestock production and subsistence agriculture. Godoy also describes overexploitation of marine and forest resources as a significant challenge. The study concludes with a number of recommendations including support for local tourism initiatives, sustainable marine resources management, strengthening of local institutions, incentivizing educational improvements, mapping and zoning of cultural heritage including archeological sites, and resolution of outstanding tenure issues with support for affected families.

Godoy conducted a second shorter study in the region entitled *Informe Diagnostico Comunidad Mapuche Huilliche de Huiro*. The study methodology was based on structured and semi-structured interviews with community members as well as field observation. Godoy describes how the zone was inhabited by Mapuche and Huilliche since the late 19th century, depending on the *alerce* forests and agriculture. The community was disrupted by industrial logging and the migration of workers to the area, and Godoy relates a number of personal accounts describing how the community has changed over time.

The second part of the study describes the socio-economic conditions at the time of the research (2003) describing population, education levels, services, and livelihoods. While the community is already electrified, the issue of contamination of water by sediment is mentioned, and schooling is available only through 6th grade. Livelihoods are comprised of a combination of fishing, agriculture, livestock, sale of wood, and other small informal businesses. Unemployment is also noted as a significant challenge. Of note, the study recounts the favorable attitude of community members to the development activities planned for the area (p. 24). Godoy concludes with a set of recommendations. He suggests a participatory process to design a sustainable development strategy, capacity building, support for community organizations, and definition of forest use, among others. These two studies by Godoy helped in the identification of community stakeholders as they revealed community use and interests in the area of the Reserve.

WWF sponsored a third background study entitled *Caracterización Preliminar de los Predios Chaihuín-Venecia, Cordillera de la Costa Décima Región*, by Aldo Farías, David Tecklin. This study presents maps to show different aspects of the area, both in terms of vegetation and forest cover as well as in terms of population settlements, cultural heritage areas, and property boundaries. This study was useful in the identification of project stakeholders from a geographical perspective as it showed the settlement areas bordering the reserve, access routes, and location of important cultural sites.

It should be noted that the five project communities do not all meet the definition of a “group of people who live within or adjacent to the project area or groups that regularly visit the area for income, livelihood or cultural values.” While these villages are close or adjacent to the reserve, the actual carbon Project Area is quite remote and the communities have no direct reliance on these particular areas. The Project Areas generate carbon credits that will help finance community outreach activities, and TNC has decided that in the interest of a holistic approach to conservation and human well-being, to treat these five communities as integral stakeholders and project beneficiaries and to recognize them as Community Groups according to CCB guidelines. Prior to TNC acquiring the VCR, access to the area was restricted by the previous private industrial owner, Bosques S.A., and communities realized no benefits from the project area or larger VCR.

Other Stakeholders, also described below, were first identified through existing relationships. These first groups subsequently recommended and introduced other relevant stakeholders who were also included in dialogues and consultations.

A3.2 List of Communities, Community Groups and Other Stakeholders

Table A3.2. Community Groups and Other Stakeholders

Location	Organization/ Community Groups	No. of Members
Huape	Agrupación Turística, Cultural y Productiva Lafken Mapu	10
Chaihuín	Junta de Vecinos Vista Hermosa	42
	Sindicato de Pescadores de Chaihuín	39
	Comunidad Indígena Lafken Kuyen Mapu	20
Huiro	Comunidad Indígena Antillanca	70
	Sociación Indígena Antillanca	26
	Sindicato de Pescadores de Huiro	26

	Agrupación de Artesanas Kutralwe	12
Cadillal Alto	Comité de Adelanto Cad. Alto	20
Cadillal Bajo	Comité Adelanto Cad. Bajo	14

Other Stakeholders

Stakeholder	Role
Municipio de Corral	Mutual support and ongoing development activities of mutual interest and benefit to the community coordination.
	Part of the management team of the Fund for Communities in protected areas in Los Rios region.
Prodesal Corral	Contribution and coordination with livestock project implemented in the community of Huairo.
Comité de protección de flora y fauna de Corral	Contribution to the preparation and certification of guards and fisheries inspectors and control of illegal activities related to the flora and fauna.
Tourists	Tourists benefit from recreational opportunities in the reserve, while also posing potential risks such as waste generation, overcrowding, and negative impacts on local culture. At the same time, tourists enhance local livelihoods by supporting tourism-related microenterprises and concessions.
WWF	Contributions and financial support in the early stage of the VCR Project
	Provision of technical support in developing the program first implemented the VCR.
	Joint agreement with UNDP-PPS, WWF and TNC; Financing and support for community projects in the buffer zone of the VCR.
	Technical team implementer for neighboring communities in the protected area.
UNDP-PPS	Joint agreement with UNDP-PPS, WWF and TNC; Financing and support for community projects in the buffer zone of the VCR.
CM	Provides professional services and advice, including the development of the management plan for the VCR
	Mutual support and collaboration in research studies and development projects within the VCR and the surrounding area.
Universidad Austral de Chile (UACH)	Research agreements on issues related to watersheds in the north of the VCR (FORECOS)

	Supports studies, practicals and thesis students at UACH to work inside the VCR and its areas of influence.
	Wildlife Rescue Center, recovery and release of wildlife.
Comisión Regional de Uso de Borde Costero (CRUBC)	TNC has been involved in this commission, which is an example of joint regional planning.
MMA PROY. GEF SIRAP	Contributes financially towards the execution of training and tours for rangers and community leaders and implementation and development of areas for public visitation in the VCR
	Financing for implementation of the pilot management of cattle in the village of Huiro.
	It is part of the management team of the Fund for Communities in protected areas in the Los Rios region.
BIENES NACIONALES	Recipient of donations to the Treasury by TNC, such as a portion of land for the creation of Alerce National Park and water rights and land for the implementation and drinking water supply for the Town of Chaihuín.
CONAF	Agreement of mutual cooperation in the protection, surveillance and contributions to local development of protected areas of the Alerce National Park and VCR and sectors of influence.
	Implementing institution with neighboring communities in protected areas of the Los Rios region.
SENCE	Develop training in the town of Chaihuín aimed at small local entrepreneurs in tourism, administrative and accounting management.
CONADI	Recipient of donations for the Comunidad Indígena Antillanca.
INDAP	Commitment to contribute in the implementation of the pilot management of cattle in Huiro.
FPA – CONAMA	Funded household waste project presented by the JJVV of Chaihuín and implemented in the towns of Huape, Chaihuín and Huiro.

A3.3 Land Tenure in the Project Zone

An analysis of land tenure rights in the project region (then Region X), prior to the acquisition of the VCR property and project start date, was conducted in 2003 and accompanies this document.⁴⁰

In conjunction with the land tenure study, TNC held a workshop for the Coalition for Conservation in the Coast Range (CCCC⁴¹) in order to elucidate private conservation possibilities and to relate their experience with private sector models applied in the US, to options available in Chile.

Archeological evidence suggests that the area has a long history of seasonal use by indigenous groups likely spanning centuries. However, permanent habitation of the zone by indigenous groups began in the second half of the 19th century, most probably as a result of the aggressive government sponsored settlement campaigns in the central valley (Godoy 2003b). The parade of prior landowners of the VCR treated the communities south of the Chaihuín River with differing degrees of tolerance. In 1949, the Lebaudy family recognized 14 families that inhabited the area between the Chaihuín river and Hueicolla, providing them with a legal basis for continued occupation (Godoy 2003b). However, subsequent landowners attempted to negate the agreements the community made with the Lebaudy family and displace the families. This situation produced considerable conflict within the communities. To resolve the conflict, Terranova S.A. (owner prior to Bosques) granted title to 730 hectares to a custodian on behalf of the communities, but a final settlement was not reached until the land was divided among the 27 families living in Huiro in 2004 (an area outside the boundary of the project area and VCR).

The acquisition of the VCR by TNC was a radical change in the primary activity on the landscape from a production to a conservation focus. Initially there was little change in the community's relationship with the land or use, and over time, several productive changes were made, whereby people lacking titles to the land where their families had historically lived were able to obtain them. One notable case was the Nauco-Atero family: Dionisio Nauco's family had an informal agreement allowing them to occupy part of Colún Bajo, which had been established with his mother but upon her death the agreement expired; TNC recognized this agreement and given that the family wished to move closer to the local school and other services, TNC donated the family a parcel of land in the Huiro sector adjacent to and complementing 12 ha that the family had received as part of the distribution of community property.

⁴⁰ Carey y Cia Abogados. 2003. Due Diligence Report on Chaihuín and Venecia Real Estate Owned by Bosques S.A. for The Nature Conservancy and World Wildlife Fund. August 5 2003 report.

⁴¹ The CCCC was formed by a variety of organizations from civil society including conservationists, scientists, professional organizations and indigenous groups, to increase the conservation value placed on the Coast Range, to develop new protected areas and to oppose threats to the landscape

The primary customary land uses of the communities surrounding the VCR are livestock grazing, seasonal murta fruit harvest (*Ugni molinae*) in the thickets of Colún at the end of summer, occasional harvest of firewood on community properties, and travel through the VCR to access important fishing coves in Hueicolla and Lamehuape. The areas around Huiro and Cadillal have the longest history of customary use.

In part, local communities meet their dietary and economic needs with marine and freshwater food sources, such as fish, shellfish and seaweed. For this reason, the VCR participates in resource use agreements related to the rivers that extend within the boundary of the VCR.

Raising livestock contributes to the well-being of many families in the community, and without this activity their socioeconomic outlook is precarious. Even though the VCR has characterized cattle grazing as a threat to biodiversity, VCR staff work with the communities to sustainably maintain the livestock population while reducing the negative impacts it generates in the project zone by improving fields for grazing on community's properties and by granting access to some selected reserve areas for grazing; previously, communities had no access to the reserve property for grazing or any other productive activity.

The Sitio Ritual de Chaway, or Saint of Chaway, is a cliff on the coast in the Colún sector of the VCR where sailors believed they saw a face that saved them from a storm. For many years this was an important religious site; people would travel from as far away as Valdivia, and some continue to visit it, for which TNC facilitates access.

Many families in the communities surrounding the VCR have insecure land tenure and as a result have difficulty accessing certain government development benefits or sustainable use incentives. As part of this framework, the TNC has worked with local communities to legalize land tenure and provide the resources necessary for sustainable development. In particular, this has resulted in the recognition of several lifetime leases for several parcels of land that were historically occupied within the boundaries of the property that became the VCR. The VCR also responded to a request for resettlement made by one of the community members in a similar situation, who wished to live closer to the rest of the community, and is donating the land title of the parcel identified in the request through National Indigenous Development Corporation (CONADI, a government agency formed to assist indigenous groups). Several other donations were made to the community for different uses including an area to monitor a shellfish concession, a site for a communal cemetery, and land and water rights to develop centralized water supply infrastructure. These donations seek to help strengthen the local communities and create a heightened sense of ownership of the natural resources around them through direct ownership and management of the resources they need.

A3.4 Free, Prior, and Informed Consent

The project has received the Free Prior Informed Consent of the communities whose customary rights are affected by the project. Godoy's anthropological studies, based on extensive interviews with community members prior to project start, convey community approbation for project development activities in the area (See Godoy 2003). As there were no ancestral territories in the area and only a handful of individuals living in the reserve at the time of purchase, customary rights corresponded with access and user rights.

The customary rights of community use and access to the Reserve prior to project start have been mapped (See Figure A3.1). Community access and use of the Reserve has actually been enhanced by the project in comparison to the pre-project situation. Whereas Bosques S.A., the previous landowner, denied communities access and user rights to the forest (though these were not always enforced), under TNC's management, community members move freely within the Reserve. Some areas of the reserve are physically difficult to access due to thick underbrush, however, community members are welcome to extract non-timber forest products in all areas of the Reserve. The map shows the most commonly accessed areas of the Reserve. In addition, community members have gained management rights to special areas for forestry collectives, controlled grazing, and fishing. Agreements signed with the communities to manage these areas indicate consent.

A3.5 Locations of Stakeholders and Locations of Stakeholder Resources

The VCR is located in a rural area of low population density. In spite of its extent (50,830 ha) covering parts of two districts of the Valdivian province, the rural populace is not greater than 1,970 persons when the city of Corral is not included. Twelve rural communities have been identified with which the VCR has either a direct or indirect relationship: San Carlos-Amargo, Palo Muerto, Los Liles, Huape, Chaihuin, Cadillal Bajo, Cadillal Alto, Huiro, Punta Galera, Colun Bajo, Hueicolla, and La Barra de Rio Bueno. Although the VCR does coordinate with the city of Corral, the VCR focuses its outreach initiatives on the communities that are closer and more marginalized, and that are either directly adjacent to the VCR or whose members regularly travel to the area and are in some way are dependent upon the VCR for income, livelihood or cultural values. Of the 12 communities indicated above, five communities on the border of the VCR fit this description: Huape, Chaihuín, Huiro, Cadillal Bajo, and Cadillal Alto. The VCR participates with these communities in rural development projects. Based on social survey studies conducted before the establishment of the VCR (Godoy 2003a, 2003b) we describe some of the fundamental aspects of these communities.

Approximately 23% of the population is dedicated to fisheries as their economic sustenance, an activity that factors heavily in social identity in these districts, although due to many factors external to the VCR, the percent of the population dedicated to this activity has dropped dramatically from 43% in 1992 (Godoy 2003a, Muñoz *et al.* 2005b).

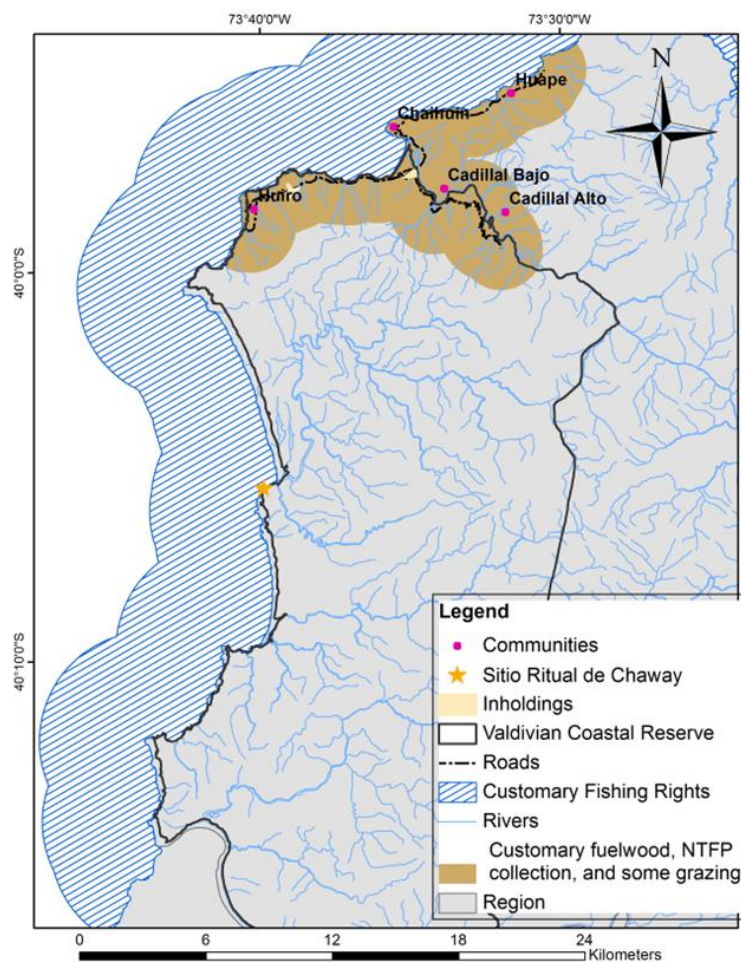


Figure A3.1. Map denoting areas of customary use and inholdings in the VCR. Predominant areas of limited forest use by communities (for fuelwood and non-timber forest product (NTFP) collection, and some grazing) delineated as areas near neighboring communities, within 2 km distance of primary access routes existing as of 2003 (deemed accessible in consultation with VCR staff).

Huape

Huape is located 17 km from Corral. Alerce Costero National Park borders it to the east, the Pacific Ocean to the west, the town of Los Liles to the north and Chaihuín to the south. Access to Huape is via the coastal Chaihuín-Corral road. The town of Huape had a population of 200 at the project start, and 257 as of the 2017 census (TNC Community Engagement Plan 2021). Huape community is one of the poorest in the coastal region. Transportation to and from Huape is provided via bus services based in Chaihuín, which link the towns of Chaihuín, Huiro, Huape and Corral. In Huape there is a rural telephone network, but no radio or television broadcasting. Health services are provided by an auxiliary field paramedic at the Huape Rural Health Post, and a doctor makes rounds once a month. Huape

lacks infrastructure and specialized personnel in the areas of administration, police and fire services, and therefore depends directly on these services located in Corral.

Artisanal fishing is the mainstay of the Huape economy (Godoy 2003a). Of the 25.3% of the population who are actively working (INE 2002, census), some 78.18% belong to the Huape Fishermen's Union. The artisanal fishermen generate income mainly from the commercialization of *locos*, the Chilean abalone (*Concholepas concholepas*) which is the only benthic resource extracted in the Huape management areas. In the summer months, this income is supplemented by the collection of marine algae (seaweed, Luga), which is marketed through the Abalone Farming Company located in Los Liles and local intermediaries of export companies. Extraction of pelagic species such as sierra (Pacific sierra), robálo (white snook) and congrio (conger) also occurs, mainly for personal consumption or sometimes for sale in Corral.

Chaihuín

Chaihuín is located 28 km south of the urban center of Corral. The boundaries of the settlement range from the Aguas Buenas area to El Apestado, bordering the town of Huiro on the coast, the VCR to the east and the Quitaluto estate. Access to the community is via the Coastal Highway, with a regular bus service from Chaihuín to Corral five times a day in the summer and less regularly in the winter.

Chaihuín had a population of 271 at the project start, and 287 as of the 2017 census (Godoy, 2003; TNC Community Engagement Plan 2021). Approximately 50% of the population has not finished primary education, and only 3.76% have technical or vocational training (Census, 2002), principally the younger generation of 15 to 30 years of age who have attained the highest levels of education. There is a rural telephone network in Chaihuín, and cell phone signal and Internet service has recently arrived, but broadcasting signals are still almost non-existent. Chaihuín has a school with several teachers who provide education up to grade 7. There is a boarding school for children from remote locations. In Chaihuín there is a rural medical outpost by the school employing a paramedic technician. Medical rounds are conducted once a month. The medical post in Chaihuín serves the communities of Huiro, Cadillal Alto, and Cadillal Bajo as well. In case of serious illness or emergencies, patients must be transferred to Corral. Regarding sanitary facilities, 83% of households are connected to a sewage system, while 17% use outhouses (Census 2002). The sewage system is not a public network connecting the whole community, but a system in which sanitary waste is transferred from each household to septic tanks, which are then emptied by the municipality of Corral. The entire population is connected to the public electric network, but the community lacks infrastructure and specialized personnel for administration, police and fire services, and therefore depends on those services located in Corral. Water is gathered from six creeks: Agua Buena, Agua Verde, Estero Don Goro, La Mina, Sta.

Elena and Estero Los Potrillos. These creeks provide water for the school, the bus station, the medical post and the surrounding households.

The community of Chaihuín is located at the mouth of the Chaihuín River, where most of the families share 22 properties owned by various community members. The average size of each property is 40 acres. Each property is shared by approximately four families, some of whom do not have legal tenure in the areas they inhabit.

Although Chaihuín has been recognized by the Ministry of Defense as being suitable for artisanal fishery (1998) and its bay is used by the Union of Fishermen, the community does not have a formal license from the authorities. 20.86% (2002 census) of Chaihuín's population actively work, of which 62.9% belong to the Chaihuín Fishermen's Union, demonstrating the importance of this activity (Godoy 2003a). Most of the Union's income is generated from the extraction of loco (Chilean abalone), which are harvested once a year. Extraction of pelagic species, such as sierra (Pacific sierra), robálo (white snook), corvina (sea bass) and congrio (conger), is mainly for personal consumption and local sale.

Most families in Chaihuín own some livestock (chicken, pigs, sheep) and farm produce for their own consumption. Firewood is extracted from individual properties or bought from vendors from the areas of Huape and Huiro.

Cadillal Bajo

The community of Cadillal Bajo is located 5 km upriver to the east of Chaihuín. Its boundaries stretch from the property of one community member to Aguas Malas creek. It borders the community of Chaihuín in the west, Alerce Costero National Park in the north (formerly the Quitaluto Estate), and the banks of the river Chaihuín in the south.

The town is accessed by boat or by a country road, which was built and is maintained by the community. In Cadillal Alto, there were a total of 28 villagers at the project start, and 12 as of the 2017 census (Godoy 2003; TNC Community Engagement Plan 2021). There are high levels of illiteracy and incomplete primary education and more than half of the population live in poverty. Most rural areas, including Cadillal Bajo supplement monetary income with subsistence agriculture and livestock, which allow them to stock up on food necessary for survival. Cadillal Bajo connects to other parts of the territory by a country road with difficult access, which is maintained by the community itself and joins up with the main road between Cadillal Alto and Chaihuín.

The absence of public transport to the area means that most of the families use small vessels to get around. Cadillal Bajo does not have any communication network, educational institutions or public health facilities, so the community relies on Chaihuín for these services. Drinking water is sourced from four collection points in local streams, but there is no formal water infrastructure or electrical

infrastructure. Four of the six households have sanitary facilities in their homes; two have outhouses connected to a cesspit. As is the case in most of the coastal sector where the VCR is located, the community of Cadillal Bajo depends on the administrative, police and fire services situated in Corral.

Of the six families that inhabit the area, only three have ownership of their lands, while the other three families have occupied state lands for over 40 years. Agriculture and livestock are the main productive activities carried out in Cadillal Bajo. This sector experiences winter flooding of the Chaihuín River from May to October as does the nearby town of Cadillal Alto. On the common lands and on the former Quitaluto property (now part of the Alerce Costero National Park), logging is carried out for personal use and firewood is also collected in the riverbed. In 2000, the Cadillal Bajo Committee was formed to implement actions to improve the living conditions of the community, primarily by focusing on improving basic services and reducing isolation.

Cadillal Alto

The community of Cadillal Alto is located 7 km upriver east of Chaihuín. The boundaries of the community are: from Malas Aguas creek to Correntoso creek, the latter located on the property of one of the community members, the last inhabitant on the river Chaihuín. It borders the town of Chaihuín in the west and the Quitaluto Fundo and Alerce Costero National Park. The southern limit is formed by the river Chaihuín. Access to the town is mainly by boat, or by a dirt road during summer months.

The total population was 28 at the project start, and 26 as of the 2017 census (Godoy 2003; TNC Community Engagement Plan 2021). A majority of the population has not completed primary education, particularly amongst the adult and senior population where illiteracy is high.

Cadillal Alto does not have a public transport system, so the population relies on their own means of transport which primarily consist of small rowing or motor boats and horses. The community is connected through a radio system, with a radio base in the VCR in Chaihuín and in the homes of two residents in the community. Two other houses also have portable radios. There is no cell phone, Internet or telephone coverage. There are no educational facilities in Cadillal Alto, therefore pupils must travel to Corral. Although the nearest school is in Chaihuín, it does not offer the final years of primary education nor boarding facilities. Moreover, the only establishment for secondary education is located in Corral. Likewise, there are no medical services in Cadillal Alto and no rounds are carried out, so in case of illness the inhabitants must travel to the medical station in Chaihuín.

The community of Cadillal Alto is not connected to the electric grid. Fresh water is obtained from individual collection points. Sanitary facilities are present in most households; three are connected to a septic tank and six to a cesspit. The community lacks infrastructure and specialized personnel in the

areas of administration, police and fire services, and therefore depends directly on the services located in Corral.

The nine families who live in Cadillal Alto own their land title deeds, but in the cases of four families, the land deeds specify the names of all four without defining the borders. Each of them has built their house in a communal area, as the rest of the land is flooded in winter when Chaihuín River rises. Flooding affects the entire community of Cadillal Alto, from May through October, since all farms are located on the banks of the Chaihuín river and border the new Alerce Costero National Park (formerly the Quitaluto Estate), consisting mainly of plains and wetlands.

According to field studies in the area, the local economy relies solely on livestock activities during 5 months of the year, from November to March, producing cattle for milk, cheese and calves (Godoy, 2003). Milk and cheese are sold in Chaihuín or Corral, while calves are marketed through an intermediary who sets the price and transports the animals. Although the entire community depends on livestock, production is carried out informally and independently by each household. There is no formal organization to secure access to state subsidies for infrastructure, and the cost of applying to subsidies individually is prohibitively high. Without the necessary infrastructure, the community cannot gain access to sanitary or commercial permits to expand the production and sale of their products. The families raise sheep and other small animals as well. They practice small-scale subsistence farming in small vegetable gardens and greenhouses for their own consumption.

The community of Cadillal Alto has created the "Cadillal Alto Advancement Committee", a group that includes most of the adult residents of the area and that is responsible for addressing social issues most relevant to the community. The members of this organization also make up the Cadillal Alto Sports Club, which is active mainly during the summer and organizes local tournaments.

Huiro

The community of Huiro is located 34 km south of Corral and 13 km from the town of Chaihuín between the rivers Chaihuín in the north and Colún in the south. The boundaries of the community are from the Apestado sector to Punta Galera along the coast, bordered on the east by the VCR and a privately owned farm. The community can be accessed by the Coastal Highway or along an old route. Locals mostly use the latter, as it crosses the settlement passing by the houses of the community.

The population of Huiro consisted of 91 people at the project start and 115 as of the 2017 census (Godoy 2003; TNC Community Engagement Plan 2021). The community of Huiro is made up predominantly of people with indigenous Mapuche-Huilliche ancestry. There are two indigenous sub-communities within the larger Huiro community: the Antillanca community and the Huiro community, which represent approximately 82% of the community.

For transportation, the community of Huiro depends on daily bus service to Corral (departing in the morning from Huiro to Corral and returning to Huiro in the evening). The community is connected to a radio network with a radio base station in the VCR which connects to three families in the area. Through this system, messages are transferred and services or assistance can be solicited in case of emergency. The Fishermen's Union also has a radio and two portable radios that are connected to the Harbor Master. There is sporadic cell phone coverage with the new infrastructure in Chaihuín, but no telephone network or Internet. Huiro has had electricity since 2003. There is no public drinking water network. Most families are connected to water collection points in various streams of the community. Most families have a bathroom inside their home, which are connected to septic tanks. (INE 2002 Census). Huiro has a rural health station but it is not currently operational and is not connected to the electricity system. This means that the community is reliant on the medical station in Chaihuín for health services, or in case of serious illness or emergency directly on the hospital in Corral. The community has a primary school up to grade 6, and is privately subsidized. After grade 6, education is continued mainly in Corral where primary school can be completed and secondary school attended. Huiro does not have police, fire or administrative services, and relies on Corral for these services.

The Fishermen's Union of Huiro holds management concessions for two benthic management areas (AMERB) off the coast: the cove of Huido and the area of Niebla, of 29 and 58 hectares, respectively. There is also a free use area in the area of Ranque beach, of which the Fishermen's Union of Huiro and the Huiro Fisherman's Association have requested management rights. In these management areas, production is focused mainly on *locos* (Chilean abalones), collection of algae (*Luga*) and gathering of shellfish for personal consumption. The cove of Huiro is recognized by the Ministry of National Defense (1998), and is used both by the Union of Fishermen and by the Association of Indigenous Fishermen, but neither of the organizations have a use concession.

Livestock is grazed on community owned pastures, but there is a deficit of 300 metric tons of fodder for the current number of animals. This deficit is due to limitations of the land caused partly by intrinsic soil characteristics but further enhanced by lack of management. Logging activities are conducted within the community properties and in a state-owned strip along the Coastal Highway. Timber is sold and also used by the community itself. Community members also collect other forest products in the vicinity of their properties and in the VCR, such as wild fruits and plants used for therapeutic purposes.

The local economy of Huiro is based on livestock production, fisheries and forestry, which together generate the main income for the community. Raising cattle provides food and monetary income for the community, and the animals' strength can be employed for work.

Forestry activities are carried out primarily in spring and summer, and firewood from the community farms is sold to intermediaries from Huape and Corral. Tourist services include family-operated

campsites (Antillanca-Aguayo), the sale of traditional food and crafts in the summer months (by a group called Kutralwe), and sea lion colony visits, hosted by a local family. Family subsistence is supplemented by agricultural activities (vegetable gardens, greenhouses, potato plantations and gathering of wild fruit), small livestock production (chickens, geese, ducks) and extraction of marine resources (shellfish, algae and fish), all destined for personal consumption.

A3.6 Community Benefits

In order to involve local stakeholders and aid in the sustainable development of the area around the VCR, early on TNC identified the need for a social program to connect with local communities and provide for the development of a positive relationship with its neighbors. An initial program formed under the direction and support of WWF staff in 2000 which had been articulating the social connection with conservation in the communities of the region since before the purchase of the VCR. The program was based on the need to coordinate with communities for the success of conservation and to help direct rural development in sustainable ways that would reduce anthropogenic pressure on the environment and improve the quality of life of the people living within it.

With regards to community benefits, the VCR's main goal to contribute to the sustainable development of communities in the local area is elaborated through a set of seven specific objectives that relate to water and sanitation/health, education, resource tenure and control, sustainable livelihoods, women's empowerment, and public relations. The seven objectives have been defined as follows:

1. All households in two villages (Chaihuín and Huiro) will have year-round access to safe drinking water.
2. Waste is managed appropriately to avoid contamination (soil, water) and attract tourists
3. The communities will have a better understanding of environmental and natural resource conservation
4. Community members will have more control over their resources
5. Community members will have increased supplementary incomes
6. Women in the communities have more financial independence and contribute to family income
7. Community members are generally satisfied with community outreach activities of the VCR

The next section explains how the project activities will contribute to achieve these objectives which in turn support the project's overall goal of sustainable development with positive impacts on local communities (See G1.2).

Access to Potable Water

TNC established an objective to provide year-round access to safe drinking water for all families in Chaihuín and Huiro where water supplies were not yet reliable and at risk of drying up. Without consistent access to potable water, communities are vulnerable to a host of water-borne diseases such

as amoebic dysentery, typhoid fever, and hepatitis. Health problems can in turn lead to medical costs and indebtedness.

TNC will work in partnership with Agua Potable Rural (APR) to prioritize extension of services to these two villages. Once all households have access to potable water, regular monitoring will continue to ensure early detection of any contamination. The output for this activity is periodic water testing to ensure water quality. These tests will occur at least one time per year, and in some cases more often depending on circumstances (flooding, risk of sedimentation, etc.). Expanded access of potable water to families in the two villages is the expected outcome for this activity, while improved health among community members is an expected impact.

It is also expected that retention of native forest, with comparatively lower water use than Eucalyptus, will safeguard yields of freshwater available to communities. Here, the output of the forest conservation activity is acquisition and ongoing protection of the reserve, and the outcome (expected impact) is higher water yields (than in the baseline scenario with extensive conversion of native forest to Eucalyptus plantations).

Solid Waste Management

Communities in the project area had no regular solid waste management system prior to the project start. Normally they would burn or bury their garbage with the risk of contamination of the air and water by toxins. Anticipating increased numbers of visitors to the area, the need to responsibly manage solid waste will become more important. In order to address this issue, TNC began work with the Municipality of Corral to organize regular waste collection days. Waste will be properly disposed of in a landfill where the risk of contamination to water supplies is diminished/eliminated⁴². At the same time, TNC aims to reduce the volume of waste generated by tourists through education and signage at the site. Increased or adequate solid waste collection days is the output for this activity, while the outcome is a cleaner and more attractive nature reserve. The longer-term impact relates to protection of environmental integrity (water and air) and a prosperous tourism business.

Environmental Education

The VCR environmental education program aims to educate both the local community as well as visitors to the Reserve. Local students will be invited to participate in environment education courses. By educating the younger generation about the importance of conservation and sustainable development, TNC aims to make a lasting impact on how natural resources are managed in the area. These courses

⁴² See http://www.directorioresiduos.cl/DR/?page_id=787 for more information on waste and sanitation services.

will be held in local schools and students will learn about a range of topics including the importance of native forest, biodiversity, and ecology.

The education program will also serve tourists. Through local guides as well as signage and other interpretive materials, visitors will learn about the conditions and characteristics of the site, the rich biodiversity of the area, and the measures being taken to conserve these resources. The program also aims to provide experiences and knowledge about the conservation value of species and ecosystems in the area. The goal is for visitors to develop a greater sensitivity, appreciation and understanding of resources and the value of the area, and to encourage visitors and local people to have a smaller environmental impact in the Reserve. TNC monitors this activity by collecting information on the number of students trained (output) while the outcome for the environmental education component is a heightened awareness, knowledge and concern for the natural environment in the area among community members and visitors. The longer term impact will be to create a stronger constituency for environmental conservation, in other words, a population which is willing to take action to protect the environment and defend its natural resources from external threats. Prior to the project start, there was no opportunity for organized environmental education.

Resource Rights

The purchase of the Reserve by TNC in 2003 signified a transfer of the property to a new landowner (from Bosques S.A.), however, whereas Bosques S.A, a private entity, excluded local communities from the area, TNC recognizes the potential to work in partnership with local communities to conserve the area's natural resources. By granting some access/use rights on certain areas in the reserve to local communities, local communities will become invested in stewardship of the resources for both their own benefit and the benefit of conservation. A number of activities shall be implemented in this vein including the allocation and maintenance of grazing lands, the allocation of camping concessions, the establishment of forest cooperatives, and the guaranteed access for the local communities to non-timber forest products within the reserve. These activities support more sustainable use of the area's natural resources by establishing codes of conduct while providing incentives to benefit local communities over the long term. The outputs for this activity are the formal agreements granting rights of use to communities and the indicator is the number of hectares under community control use. The expected outcome is the empowerment of local communities who gain a sense of ownership and control over resources that they manage. The longer term impact refers to sustainable use of land, fisheries and forests based on the theory that communities with a stake in natural resource management are more likely to protect their resources.

Sustainable Livelihoods

When TNC started the project in 2003, local people struggled to make a living. Based on studies and consultations with the communities, TNC put a plan in place to support alternative livelihoods based on sustainable incomes. This plan includes training and support for microenterprises linked to ecotourism within the reserve. The Reserve's scenic beauty, diversity of landscapes and link with local communities all provide excellent potential for the development of ecotourism. Microenterprises linked to traditional handicrafts, local food, and other tourism services will provide supplemental income to local communities.

In addition, TNC will hire local people to work for the project whenever possible. This strategy provides valuable professional skills to community members while enhancing general communication with communities.

Lastly, TNC will support the training of local guides to accompany tourists in the VCR. Guides bring their own valuable local knowledge but will also receive extensive training in a range of subjects including sustainable tourism, biodiversity, and ecology. The guides will gain valuable experience in the tourism industry while making additional income to support their families.

The outputs for this activity include training, promotional activities and hiring. The indicator is the number of families benefiting from microenterprises or employment opportunities. The expected outcome will be a more business savvy community, and ultimately the impact will be more prosperous and resilient livelihoods for local people.

Women's Empowerment

TNC will promote local women in the communities through support for women-owned businesses such as traditional handicrafts and restaurants. Women will receive training and coaching to launch and operate small enterprises. Through operating these businesses, women will gain more confidence as well as supplemental income for their families. The outputs for this activity are training and promotional activities and the indicator is the number of women involved and benefitting from these small businesses, while the outcome is the empowerment and confidence building of local women through new skills and financial independence. The longer-term impact is a gender-balanced development in the community. Prior to the project start date there were no women-owned businesses in the area.

A3.6 Feedback and Grievance Redress Procedure

The VCR has clearly articulated a Protocol to describe the project's feedback and grievance redress procedures, which has also been disseminated in the Project Summary, along with contact information for the VCR administration. In accordance with TNC's 'open door' policy, this Protocol consists in

accepting whatever concern or grievance is presented, whether verbal or written, and responding to it according to the procedures defined in the Protocol. In cases of minor concerns, requests for information or questions related to the VCR project activities, the community or stakeholder group member is requested to convey their concern or request in writing to the VCR administration. The VCR administration will reply within a maximum of 10 days from the date of receipt, indicating the manner in which the request will be addressed, either through written clarification, face-to-face meeting, or assembly.

TNC endeavors to prevent conflicts from arising by undertaking the following actions:

- Maintaining information on the VCR project on its website
- Providing updates on VCR project activities in the trimesterly bulletin
- Maintaining the 'open door' policy for claims and suggestions
- Providing access to meetings, particularly those related to community activities

In the case of a more serious issue or conflict, TNC will first attempt to defuse the problematic issue through a solution based on mutual consensus. If needed, the TNC will call on a neutral third party mediator, the Alcalde de la Comuna, to assist in the resolution. The VCR is committed to following this procedure and achieving consensus with the community in regard to its activities and in doing so optimize the benefits that can be produced for them. In the unlikely event that the conflict is not resolved satisfactorily even with the intervention of the neutral third party mediator, the conflict may be taken to court in the relevant district.

TNC maintains a database to store documents and a tracking system for complaints and grievances in order to monitor and ensure that they are addressed within the given timeframe and resolved satisfactorily. The database contains basic information on the grievance including:

- Date of submission
- Individual or group submitting the grievance
- Request, concern, or grievance (classification)
- Date of reply by TNC
- Status of resolution
- Notes

Lastly, TNC makes information on grievances and project responses available to the public through an update during the annual meeting.