

Sustainability Report N°1

2022

Museo de Historia
Natural de Valparaíso



Sustainability Report N°1

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Working for a Sustainable Museum

Table of Contents

03 | Prologue

04 | Introduction

05 | We are the Museum

06 | During the Pandemic

10 | Creation of an Environmental Management Area

14 | Estado Verde Program

21 | On the way to the Pre-accreditation

37 | Sustainable Development Initiatives and Activities

42 | Conclusions

43 | References

44 | English translation

Prologue

“Working for a Sustainable Museum” is the motto created between late 2019 and early 2020 by the team of the Museo de Historia Natural de Valparaíso (Natural History Museum of Valparaíso) in response to the challenging times being experienced both nationally and internationally. In Chile, social changes were unfolding, while globally, a new health scenario was emerging: a pandemic. The mandatory pause led us to observe ourselves, reflect, and reconsider our strategies as a cultural organization in service to the community.

From a general and longstanding perspective, the Museum's editorial approach has been characterized by its commitment to bringing cultural and natural heritage closer to the community, promoting science and research, and disseminating both temporary and permanent exhibitions that foster awareness, care, and protection of the environment. However, the time had come to take action from within, integrating the environmental dimension into all areas of work, understanding the environmental impacts, and taking steps to control or mitigate the negative ones. This opportunity allowed for better decision-making aimed at the more efficient use of resources and habits, ultimately working toward the reduction of the Museum's carbon footprint.

In this context, the Museum joined the broader network of museums of the National Service of Cultural Heritage, and in February 2021, it became part of the *Estado Verde* (Green State) program, led by the Ministry of the Environment, as a pilot initiative in the Valparaíso Region.

The sustainability work developed by the Natural History Museum of Valparaíso, now integrated into its vision, is based on the fundamental principle that all participants benefit at a personal, community, and environmental level (*Dragon Dreaming* method). In this way, ongoing cooperation and collaboration, both internally and with the local territory, are essential and vital for the meaningful creation and continuous improvement of sustainable actions over time.

This Sustainability Report corresponds to the first edition and stands as a demonstration of the institution's commitment to gradually and decisively strengthen its sustainable performance, while also contributing to the 2030 Agenda and the 17 Sustainable Development Goals (SDGs).

In the month of June, when World Environment Day is celebrated, this Sustainability Report is submitted after two years of implementing an environmental management policy within the organization. The report outlines the actions and measures undertaken in the environmental, social, cultural, and economic fields.

Cinthia Mora Troncoso
Environmental Management Manager
Museo de Historia Natural de Valparaíso

Introduction

The Museo de Historia Natural de Valparaíso (MHNV, for its initials in Spanish) is a state museum that will celebrate its 145th anniversary this year. It is the second oldest museum in Chile and one of the three natural history museums belonging to the *Servicio Nacional del Patrimonio Cultural* (National Cultural Heritage Service). Since its foundation in 1878, it has held the vision and mission of bringing natural sciences, research, dissemination, and education to the community, starting with naturalist galleries and expeditions, evolving through science, and now carrying out significant work in environmental sustainability.

The Valparaíso region covers 2.16% of the country's surface area and has a population of approximately 1,539,852 inhabitants. It is the only state museum that receives more than 35,000 visitors annually, 70% of whom come from 55 schools, 11 kindergartens, and 8 universities in the region, while the remaining 30% are families and tourists. Based on this context and these figures, the Museum offers a variety of museographical, scientific, and educational services. These are centered around a permanent exhibition created in 2015, which won the Avonni award that same year. The exhibition's narrative evokes an exploratory journey from the ocean depths of over 6,000 meters to the high peaks of Aconcagua. This journey spans thirteen rooms and includes more than 700 collection pieces, addressing the cross-cutting objective of showcasing how various species in the Mediterranean region of Chile adapt, feed, and reproduce.

At the beginning of 2020, the pandemic was a complex moment in which new challenges had to be faced, a virtual format had to be adapted to, and new opportunities were created for connecting with the community. Although the Museum had to close its doors to the public, several innovative and playful methodologies emerged in a virtual format, allowing the natural sciences and heritage to be brought closer to the public through discussions, workshops, infographic creation, contests, among other actions, together with collaborators located at regional, national, and international levels.

In October of the same year, the Museum created the Environmental Management Area, headed by a professional Environmental Engineer, who took on the challenge of promoting sustainable habits and practices aimed at both the Museum's internal team and the community, initially through virtual means, and later also in person at the institution's premises.

To strengthen this initiative, in February 2021, the Museum joined the Estado Verde Program, run by the Ministry of the Environment, as a pilot plan in the Valparaíso Region, since the program had previously been centralized in the Metropolitan Region. The outcome of this accreditation commitment was the creation of an environmental self-management policy, incorporating the environmental variable into all of the Museum's activities, and implementing an environmental management plan focused on continuous improvement.

In March 2023, the Museum achieved Intermediate Level accreditation, becoming the first state museum to develop sustainable practices and policies within the National Cultural Heritage Service (Serpat, for its initials in Spanish).

In the following chapters of the first edition of the MHNV Sustainability Report, the reader will be able to explore in depth the institutional context, the environmental self-management policy, and the environmental management plan, including its goals, achievements, and reflections on future challenges, with the hope of contributing to and encouraging more public and cultural spaces to join and actively support the transition toward a sustainable society in a responsible way.

We are museum

The Museo de Historia Natural de Valparaíso (Natural History Museum of Valparaíso) is a public institution that belongs to the National Cultural Heritage Service (Servicio Nacional del Patrimonio Cultural) and is linked to the Government of Chile through the Ministry of Cultures, Arts and Heritage. From a local perspective, the Museum is affiliated with the Valparaíso Regional Directorate of the same service. Located in the Palacio Lyon, a building declared a National Monument in 1979, the Museum houses an important collection of approximately 80,000 museological items related to the natural sciences, history, archaeology, and anthropology.

Mission

To preserve, safeguard, research, and disseminate heritage, from the biological to the sociocultural, in order to foster positive changes in its perception, appreciation, and protection. This work aligns with international agreements on the protection and management of biodiversity, ensuring the proper safeguarding of flora and fauna, as well as the archaeological and historical heritage of the Valparaíso region. To act as a Legal Depositary in the Valparaíso region, safeguarding heritage from discoveries, archaeological sites, or donations derived from administrative and legal mandates, in accordance with the National Monuments Law.

Vision

To work toward a sustainable museum, fostering a spirit of service to the community with an inclusive approach, acting as a mediating agent between the State's socio-cultural policies and the appreciation of both natural and cultural heritage. The Museum promotes research, conservation, and educational dissemination of this heritage.

According to the International Council of Museums (ICOM), a global non-governmental organization that brings together museums and museum professionals from around the world, with the aim of “researching, preserving, perpetuating, and transmitting to society the world's cultural and natural heritage, present and future, tangible and intangible”, a new definition of museum was approved in Prague on August 24, 2022. This definition, the result of a democratic and open process, includes new elements:

“A museum is a non-profit institution, permanent and at the service of society that researches, collects, keeps, interprets, and exhibits tangible and intangible heritage. Museums, which are open to the public, accessible and inclusive, foster diversity and sustainability. With the involvement of communities, museums operate and communicate ethically and professionally, offering varied experiences for education, enjoyment, reflection and knowledge sharing”.

Museum's Diversity

Sustainable Museum

- Science and Research Department
- Administrative Area (Document and Records Management)
- Education Department
- Environmental Management Area
- Communication and Dissemination
- Visitor Guidance
- Operations Area
- Scientific Library
- Security and Surveillance

During the Pandemic

A context preceding the development of the Environmental Management Area

The Natural History Museum of Valparaíso, during the health crisis, was forced to close its doors to the public (March 2020) and faced new challenges. On the one hand, it had

to develop review programs to ensure the continued safeguarding and conservation of the collections under its care. On the other hand, it had to adapt to a situation in which the population was confined to their homes, prompting the creation of new ways to communicate and share information. It became clear that virtual engagement was the way to bring heritage, knowledge, and identity closer to people through various actions and activities. At the same time, the Museum took on the responsibility of promoting self-care, inclusion, diversity, and environmental awareness and protection.

To achieve this and to create meaningful virtual meeting spaces for the community, the development of collaborative networks at the regional, national, and international levels was essential. It was during this time that activities began to be approached from a sustainable perspective, considering cultural, environmental, social, and economic aspects.

The activities involved participants and collaborators from various parts of the world, including Germany, Argentina, Australia, and Chile, among others. The Museum's official social media channels served as the main platform for broadcasting these events.

Topics covered in the various interviews and workshops included: *Native Forests and Edible Gardens: Chile and Argentina Experience*, *How Wildlife Is Impacted by Dogs and Cats*, *What You Should Know About Dogs and Cats*, *Concert with Charlie Mgee from the Formidable Vegetable Sound System Band*, *Dragon Dreaming: Working for a Sustainable Practice*, *Permaculture: Developing a Sustainable Orchard Project*, and *In Quarantine: Join Us and Recycle Your Waste*. In this context, distance was no obstacle to collaboration. On the contrary, it allowed for a broader reach in terms of dissemination and participation.

Below are the records of the interview and workshops conducted:

Interviews with Paloma Pereira

Veterinarian specializing in Conservation, Biodiversity, and the Environment, with a diploma in Clinical Ethology of Companion Animals and Floral Therapy. She has experience in wildlife conservation and environmental education, currently working in wildlife conservation at the *Reserva Natural Municipal y Bien Nacional Protegido Humedal de Cartagena*, a Municipal Nature Reserve and Protected National Asset located in the Valparaíso Region.

How Is Wildlife Affected by Dogs and Cats?

Identification of the negative impacts caused by domestic dogs and cats on wildlife.

What You Should Know About Dogs and Cats?

An invitation to reflect on responsible pet ownership, in accordance with the obligations established under Law 21.020 – *Responsible Pet Ownership Act* (TRAC, for its acronym in Spanish).

Interview with Gisela López and Mónica Álvarez

Natural Resources and Environmental Engineers, professors at the National University of La Pampa, Argentina. They teach in the faculties of Agronomy and Exact and Natural Sciences, respectively, in courses such as Introduction to Forestry, Nurseries and Arboriculture, and Management of Natural Forests.

The topics discussed include the loss of native forests and regulations related to their recovery, the situation of native forests in the central areas of Chile and Argentina, and experiences with community orchard projects.

Concert: Formidable Vegetable Sound System by Charlie

Australian musician

Charlie used his music to participate in quarantine mediation by inviting the community, through entertaining and motivating songs, to learn about permaculture and sustainable living.

Interviews with Alexander Vergara Castro

Environmental Engineer, Permaculture Designer, and Specialist in Environment and Sustainability, based in Freiburg, Germany.

The interview focuses on the Dragon Dreaming methodology to develop a sustainable orchard project.

In Quarantine, Join Us and Recycle Your Waste

Cinthia Mora Troncoso, Environmental Engineer from Chile, leads a campaign to recycle organic waste. A practical guide for composting and vermicomposting is also provided. The guide was illustrated by Alexandra Ibaceta Guerra, an intern student from the Illustration program at DuocUC, a Chilean institute.

Reflections

Conclusively, the period of confinement due to the pandemic, although challenging, represented a powerful opportunity to develop content and bring it closer to the community through experience, enabling people to reflect, empower themselves, and adopt practices to become more responsible and conscious citizens of the planet.

The Museum team also recognized the need to take organizational actions that align with its values and establish itself as a regional reference.

According to data from the Ministry of the Environment¹, there are 440,000 public officers who use materials and resources daily. Examples include: electricity consumption, amounting to 355 million kWh per year, equivalent to the weight of 862 blue whales averaging 140 tons each; annual paper consumption reaching 4,884,737 reams, equal to 305,296 trees; and annual water consumption of 4,440,670 m³, enough to fill 1,860 Olympic swimming pools. The total annual expenditure on these resources is approximately 51 million dollars.

On the other hand, climate change is currently one of the planet's main problems, causing progressive alterations in weather and temperatures worldwide. These problems arise from various causes, mainly human activities such as transportation, deforestation, industrial processes, waste generation, and inappropriate energy use, among others. In recent years, climate change has become a critical challenge for humanity, prompting opportunities to engage in dialogue and implement impactful measures to reverse or minimize its effects.

The Sustainable Development Goals (SDGs) constitute a universal call to action to end poverty, protect the planet, and improve the lives and prospects of people around the world. In 2015, all United Nations Member States approved 17 Goals as part of the 2030 Agenda for Sustainable Development, which sets a plan to achieve these objectives within 15 years (UN 2023).

Additionally, in 2019, at its 25th General Conference held in Kyoto, Japan, the International Council of Museums (ICOM) committed to establishing sustainable measures by implementing the 17 objectives of the 2030 Agenda. Following the resolution of the ICOM² General Assembly in Kyoto, the need arose to promote sustainable habits and integrate sustainability adapted to the specific needs of museums and cultural institutions.

Museums worldwide, upon learning of the conference's decisions, have begun to propose plans and initiatives to make sustainability an active part of their operations. This includes fostering collaborative work between museums and other institutions to promote joint projects and share sustainable practices. Additionally, efforts have been made to restore and rehabilitate infrastructure and implement technologies that

¹ <https://portalestadoverde.mma.gob.cl/>

² According to ICOM, museums around the world have the role of researching, perpetuating, and conserving cultural and natural heritage.

contribute to sustainable development. These actions also involve disseminating information to raise awareness and strengthen the commitment of staff teams.

In Chile, the implementation of sustainable measures in public institutions is still in its early stages. For this reason, the Natural History Museum of Valparaíso has independently taken on the challenge of responding to this mandate by joining the transformation. The Museum aims to assess the current state of its internal environmental management in order to develop strategies that mitigate negative environmental impacts and reduce its carbon footprint.

1. No Poverty
2. Zero Hunger
3. Good Health and Well-Being
4. Quality Education
5. Gender Equality
6. Clean Water and Sanitation
7. Affordable and Clean Energy
8. Decent Work and Economic Growth
9. Industry, Innovation and Infrastructure
10. Reduced Inequalities
11. Sustainable Cities and Communities
12. Responsible Production and Consumption
13. Climate Action
14. Life Below Water
15. Life On Land
16. Peace, Justice and Strong Institutions
17. Partnerships for the Goals

EXPLORATION

Creation of an Environmental Management Area

"Since the beginning of the Industrial Revolution, the development of practices and technologies has influenced our consumption and production habits, but also the environment in an unprecedented way" (Suazo, B., 2017, p. 4). Contributing factors include rapid industrialization, population migration from rural to urban areas, and the adoption of new and diverse consumption patterns. These changes have had a significant impact on societies, not only in terms of economic structures, but also in political, social, and cultural spheres.

In response to these issues, the concept of sustainability has gained increasing relevance. It is now understood both as an ongoing process and as a long-term goal. This concept has become more prominent on the global agenda, driven by various actors in global geopolitics, including international and regional organizations, states, NGOs, social networks, and grassroots movements. These actors aim to find solutions through sustainable development that serve the common interests of the entire planet.

Given this context, it is essential to adopt changes in habits, not only at the individual level, but also within public services. Museums, libraries, and cultural spaces must be part of this transformation by integrating sustainability into their administrative operations, physical spaces, institutional practices, and museological processes. Doing so will contribute to the protection and preservation of ecosystems, water resources, and biodiversity.

At the beginning of 2020, a working team was formed at the Museum, called the Sustainable Core, with the aim of addressing sustainability through a strategic plan that would yield tangible results within a defined timeframe. The plan also considered forming alliances with other institutions and initiatives, including environmental education through practical workshops, the implementation of a green wall or green square in the Museum courtyard, and the creation of a space for outdoor workshops, open to both the community and Museum staff, among other initiatives.

The initiative began with a survey conducted in July 2020, which assessed the Museum staff's knowledge of basic sustainability concepts, such as renewable energy, energy efficiency, recycling, environmental policy, lifestyles, preferred modes of transport, and topics to be included in an action plan. The findings from this survey later informed the development of work plan guidelines. During this period, the need to create a dedicated area within the Museum to lead sustainability efforts was also identified.

In this context, the Museum Director, Mr. Sergio Quiroz Jara, created the Environmental Management Area on October 1, 2020. The area is led by Cinthia Mora Troncoso, an environmental engineer who took on the challenge of leading and positioning sustainability as a cross-cutting theme within the Museum's internal processes, while also creating initiatives focused on community engagement.

Once the area was established, a preliminary report was prepared. It included an assessment of the internal management practices implemented to date, along with national and international data related to the integration of environmental considerations into the operations of museums, libraries, and public institutions more broadly.

The report addressed the following topics: Results of the staff survey conducted within the Museum, A review of all departments regarding sustainable actions and/or practices that had been voluntarily implemented, including those that were unsuccessful and those still in operation, An overview of how sustainability is applied in museums across Europe, A survey of sustainable actions and practices in national and international museums, libraries, and public institutions

Key findings from the report include:

- Survey results were positive: between 53% and 74% of respondents demonstrated knowledge of sustainability, renewable energy, recycling, and energy efficiency.
- In terms of lifestyle, over 50% of participants reported engaging in sustainable practices such as recycling, reusing materials, efficient electricity use, and preferring local trade.
- Regarding transportation, most staff members reported using public transport.
- As for the proposed action plan, 84% of respondents agreed on the importance of generating participatory policies and guidelines to incorporate environmental considerations into all internal processes, aiming to mitigate negative environmental impacts and reduce the carbon footprint.
- From the internal consultation with each department, it was observed that most were already engaged in recovery and reuse practices, such as repurposing filing cabinets, cardboard, ethafoam for packaging, foamed PVC, and producing notebooks and paper from used sheets. Materials were also being planned for multiple uses to extend their life cycles.
- Additional measures related to technological improvements were also noted: In 2020, the Museum replaced the screens in the permanent exhibition with LED screens, resulting in more efficient energy use and a decrease in energy consumption. In line with this effort, the Servicio Nacional del Patrimonio Cultural (National Cultural Heritage Service, Serpat) has been monitoring electrical energy consumption in public institutions since 2017. From 2021 onward, data on the thermal envelope of buildings began to be collected and uploaded to the Gestiona Energía platform³, led by the Ministry of Energy, which aims to promote efficient energy use in public buildings. The efficient use of energy brings multiple benefits. One of the most immediate is cost savings,

³ https://sectorpublico.gestionaenergia.cl/?page_id=11

which also leads to a reduction in greenhouse gas emissions released into the atmosphere.

- Regarding the state of implementation of environmental considerations and the adoption of related measures and practices in museums, libraries, and public institutions (both in Chile and abroad) it is evident that environmental issues are being incorporated at a slow and relatively recent pace. Chile is no exception to this reality. In the specific case of museums in Barcelona, an essay written in 2011 by Joan Rieradevall, Jordi Oliver Solá, and Ramón Farreny Gaya notes that the inclusion of sustainability in museums was still scarce by the late 1990s. This scarcity extended not only to exhibition narratives, but also to infrastructure and daily practices that reflect environmental awareness. Furthermore, studies on environmental topics, such as resource consumption and waste generation, within the museum context were limited. This reality stands in contrast to the important role museums can play as platforms for environmental communication, helping to inform and raise awareness among audiences. As a result, there is a growing need to implement tools that integrate environmental considerations, such as environmental diagnostics, which make it possible to quantify resource demands and the impacts generated within museums. These tools contribute to the management of more eco-efficient spaces and, at the same time, position museums as powerful platforms for communicating sustainability to the community.
- As a final conclusion of the preliminary report, the need to generate and promote an environmental culture through spaces linked to culture and tradition was highlighted. These settings present a valuable opportunity to shift perspectives and foster habits that encourage more efficient and conscious use of natural resources, contributing directly to the protection and care of the environment. In doing so, museums can position themselves as key platforms and reference points for communication on sustainability issues within their communities.
- Recognizing this potential, the Museum decided to create a formal Environmental Management Policy, based on a deep understanding of the complexities, opportunities for improvement, and progress already made in cultural institutions. With this forward-looking vision, in February 2021, the Natural History Museum of Valparaíso joined Chile's *Estado Verde* Program, becoming the first state museum to implement sustainable actions and continuous improvement plans recognized by the Ministry of the Environment.

COLLABORATIVE WORK

Estado Verde Program

The Natural History Museum of Valparaíso joined the Green Status Program as a pilot initiative in the Valparaíso Region on February 22, 2021, formalizing the agreement through Resolution No. 0127.

What is the Estado Verde Program?⁴

It is an accreditation program developed by the Chilean Ministry of the Environment, aimed at incorporating good environmental practices into the daily operations of State institutions. Through an accreditation process, the program certifies that participating entities implement various internal sustainability measures.

This is a voluntary management tool designed to support the advancement of sustainability in the public sector. It also helps contribute to both national and international sustainability commitments, particularly those outlined in the 2030 Agenda for Sustainable Development and its Sustainable Development Goals (SDGs).

The program's main objective is to foster a shift in environmental culture within public institutions, encouraging public employees to become active participants in the process, whether through simple actions, such as turning off unused lights, or by developing initiatives that improve efficiency and reduce environmental impact.

What Are Its Objectives?

- To empower employees and collaborators to incorporate environmental considerations into their habits and workplace behavior.
- To reduce negative environmental impacts generated by the daily operations of State institutions.
- To develop an educational plan and provide ongoing training for staff on environmental issues in general.
- To progressively support the environmental management of public institutions.

⁴ ME, *Green Estate Manual* (2019, page 8).

How Is It Implemented?

The program is implemented through a transformational strategy developed by each participating institution. This strategy incorporates the environmental variable into key areas such as:

- The use of materials
- Procurement of products and services
- Waste management
- Rational use of water and energy
- Ongoing employee training and awareness

These actions collectively aim to reduce the institution's environmental impact and promote a culture of sustainability within the public sector.

Procedure

First Stage

Duration: Approximately 6 months

This stage primarily includes the following steps:

- Appointing a representative to lead the process.
- Forming the Estado Verde Committee.
- Conducting a diagnostic assessment.
- Designing an annual plan that includes clear objectives and compliance indicators.
- Preparing the required dossier.

A documentary audit is then carried out, involving a detailed review of the submitted report. This audit is conducted by official auditors based on the criteria established in the Estado Verde Manual.

Depending on the results of this assessment, the institution may receive pre-accreditation under the Estado Verde Program.

How Did the First Stage Develop at the Museum?

The person appointed to lead Environmental Management at the Museum was Cinthia Mora Troncoso, an Environmental Engineer with experience in environmental management. She was designated as the Technical Coordinator and the official counterpart responsible for leading the implementation and execution of the Estado Verde Program at the Museum.

At the beginning of the program's implementation, several challenges had to be addressed due to the COVID-19 pandemic. As a result, many of the activities were conducted virtually, in order to minimize health risks and comply with the guidelines issued by the Ministry of Health (MINSAL).

As a first step, the Technical Coordinator developed a pocket book outlining the key components of the program. Designed to be visually engaging, the booklet included a glossary of basic environmental concepts with the goal of informing and motivating public servants to actively participate in the process.

In addition to the previously mentioned actions, training sessions were organized for the Museum staff, covering the following key topics: “Ley Marco 20.920 para la Gestión de Residuos, la Responsabilidad Extendida del Productor y Fomento al Reciclaje” (*Framework Law 20,920 for Waste Management, Extended Producer Responsibility and Promotion of Recycling*, commonly known as the REP Law), delivered by Ignacio Rojas, professional from the Department of Circular Economy, SEREMI of the Environment. “Eficiencia Energética” (*Energy Efficiency*), presented by Hermann Balde and Pedro Rencoret, from the SEREMI of Energy. “Cambio Climático” (*Climate Change*), presented by Priscilla Berríos, Leader and Mentor of The Climate Reality Project. “Comité Estado Verde”, “Trabajando por un Museo Sostenible” (*Working for a Sustainable Museum*), “Trabajando por un Servicio Sostenible” (*Working for a Sustainable Service*), a training session also extended to other public institutions in the Valparaíso Region, and delivered by the Museum's Environmental Management Officer.

The following representatives from institutions affiliated with the Servicio Nacional del Patrimonio Cultural (SERPAT) attended the training sessions:

- Regional Directorate of Valparaíso
- Coordination of Public Libraries, Valparaíso Region
- Intangible Cultural Heritage, Valparaíso Region
- Santiago Severin Public Library
- Regional Directorates of: Arica and Parinacota, Tarapacá, Antofagasta, Coquimbo, Metropolitana, O'Higgins, Maule, Biobío, Los Lagos, Aysén
- National Director and representatives from the Cabinet (Gabinete)
- Representatives from specialized regional museums
- Assistant Director of Regions

Estado Verde Committee

Since the Estado Verde Program involves multiple processes that must be executed and monitored, it is essential to have the participation of representatives from all areas and departments of the Museum. These representatives form the Estado Verde Committee (CEV, for its initials in Spanish).

It is mandatory that the Administration and Finance Division (or its equivalent) be represented in the committee, and its formation must be formally established through an official act. The Estado Verde Committee serves as a key participatory and essential instrument, and is guided by the following fundamental principles⁵:

- Collaborative participation
- Responsibility and conviction
- Prevention
- Coordination
- Realism
- Gradualism

Collaborative participation refers to the opportunity for both staff members and management to express their opinions and become actively involved in the transformation process and the integration of environmental considerations into the institution's daily operations. This principle encourages all divisions, departments, and offices to work together and actively engage in the institution's environmental management.

The principle of responsibility and commitment is not limited to the program coordinators, it extends to all staff and leadership. Everyone is expected to take an active role in adapting their work habits and behaviors. Each person has a part to play in the successful implementation of the Estado Verde Program.

The third principle is prevention, which aims to avoid the generation or worsening of environmental problems through proactive measures.

The fourth principle is coordination, emphasizing the intersectoral and interdisciplinary nature of environmental management. Transversality and synergy must be fostered among the divisions, departments, and offices involved, creating multiple partnerships that strengthen the institution's environmental management.

⁵ MMA (Ministry of the Environment), Green State Manual (2019, p. 8).

The fifth principle is realism, which is essential for effective planning and the successful management of a Estado Verde. Goals must be achievable, taking into account available resources, capacity, and feasibility.

The sixth and final principle, closely linked to realism, is gradualism. This principle recognizes that environmental management must be progressively and permanently structured, developed, or reformed within the institution.

Setting up the Estado Verde Committee of the MHN

The Estado Verde Committee (CEV, in Spanish) was officially established through Memorandum No. 26/2021. The committee includes appointed representatives from all areas and departments of the Museum, including a representative from Administration and Finance, which is part of the Regional Directorate of the Service.

Members of the CEV have the right to speak and vote. They are also responsible for communicating agreements, reports, progress, and tasks to the units they represent. Furthermore, they oversee the fulfillment of the environmental goals agreed upon by the CEV for each area⁶.

How Has the MHN's Estado Verde Committee Performed Its Role?

The committee consists of regular and alternate representatives from the various areas and departments of the Museum. It began functioning in April 2021, actively participating in meetings and in the collection of information necessary to carry out the environmental diagnosis, as required by the Estado Verde Manual.

During 2021, the committee met semiannually, and the minutes of these meetings were shared with the entire Museum team. To further strengthen environmental management and progress with the Estado Verde Program, the required actions and measures were reinforced during all-team meetings, ensuring full participation of the Museum staff.

Members of the Estado Verde Committee of MHN

Estado Verde Committee Board

- Cinthia Mora – Technical Coordinator
- Sergio Quiroz – Chairman
- Cailyn Herrera – Secretary

⁶ MMA (Ministry of the Environment), Green State Manual (2019, p. 9)

Representatives of John Juger Scientific Library

- Vivian Cordero – Principal Representative
- Loreto Meléndez – Alternate Representative

Representatives of Sciences and Investigation Department

- Anabell Lafuente – Principal
- Lilian López – Alternate

Representatives of the Education Department

- Andrea Vivar – Principal
- Alejandra Baradit – Alternate

Representatives of Communication and Outreach

- Juan Pablo Cruz – Principal
- Claudio Ampuero – Alternate

Representative of Document Management

- Patricia Díaz – Principal

Representative of Operation

- Hugo Báez – Principal

Representatives of Surveillance and Security

- Myriam Droguett – Principal
- Liliana Lobos – Alternate

What are the functions of the CEV (Estado Verde Committee)?⁷

1. Executive chairmanship:

Held by the Museum Director. Responsibilities include: convening the meeting, approving the chart, opening sessions, facilitating discussion and voting (with tie-breaking vote), reporting progress on environmental, redirecting actions to meet institutional goals.

⁷ MMA (Ministry of the Environment), Green State Manual (2019, p. 9)

2. Secretary in general:

Acts as the official recorder of committee decisions (minister of faith), keeps records of meetings and decisions, prepares meeting agendas, minutes, and internal communications.

3. Technical Coordination:

Led by the Head of Environmental Management (specialist), communicates progress on environmental goals and short-term indicators, coordinates data collection with committee members, serves as liaison with the Ministry of the Environment.

The main functions of the CEV are the following:

- Participate actively in regular meetings.
- Collaborate during the diagnosis phase, environmental management plan design, and reporting at every process stage.
- Supervise progress toward environmental goals.
- Support and facilitate prioritized work areas to ensure successful implementation of the Estado Verde Program in the Museum.
- Communicate progress and challenges within teams, acting as a communication bridge among all staff.

4. The Staff:

All museum personnel, general functions:

- Actively participate in the process of change and integration of environmental factors that affect the institution's daily operations.
- Collaborate in adapting work habits and behaviors to be more environmentally friendly.
- Help prevent environmental issues or degradation through various preventive actions.
- Promote cross-functional collaboration and synergy among museum areas and departments to build multiple partnerships that strengthen institutional environmental management.

On the way to the Pre-accreditation

The purpose of the diagnosis⁸ is to enable the institution to identify and reflect on the environmental impacts resulting from the consumption and behaviors inherent in employees' daily operations in fulfilling their mission. Its development provides a baseline that will serve as the foundation for the environmental challenges to be gradually and realistically defined by the Estado Verde Committee during the accreditation stage.

The diagnosis evaluates the following aspects:

- Internal Policy of Environmental Self-management
- Paper use
- General waste
- Water
- Electricity use
- Transport
- Sustainable purchasing and circular economy
- Disposal of movable property
- Internal Environmental Education
- Huella Chile

The information was collected through a monitoring guideline that made it possible to determine the current status of the Museum's internal environmental management at that time. The guideline was applied by the Estado Verde Committee in both the "Carlos Porter" administrative building and the "Palacio Lyon."

The Carlos Porter building, which has restricted access for both staff and visitors, consists of five floors, including a basement and attic. It houses a reception area, offices, bathrooms, kitchen and dining room, meeting room, science lab, scientific library, and storage facilities.

The Palacio Lyon, which receives at least 35,000 visitors per year from different parts of Chile and the world, has two floors. It includes a reception, offices, auditorium, recycling and reuse point, public bathrooms, temporary and permanent exhibition halls, a didactic room, and a dining room.

⁸ MMA (Ministry of the Environment), Green State Manual (2019, p.11).

Methodology Conducted at the Museum

To carry out the diagnosis, a thorough review of the information for each assessable aspect was conducted. It was led by the Technical Coordinator with the collaboration of the representatives from the Estado Verde Committee (CEV).

Some of the data used corresponds to the years 2018, 2019, and 2020, since the pandemic forced both the closure of the Museum and the implementation of remote work, at least initially. For this reason, it was necessary to rely on data that reflected actual consumption, that is, without sanitary restrictions.

For certain measurements, such as water usage, electricity consumption, and waste generation, visitors were taken into account, as their numbers far exceed those of the Museum staff. This is particularly evident in waste production and in water and electricity usage. For example, audio systems, screens, and lighting fixtures, part of both permanent and temporary exhibits, are in constant use from Tuesday to Saturday.

The following are some of the monitored contents:

- **Existence of an environmental self-management policy**

- **Regarding paper usage:** Quantitative description of annual paper usage, including paper expenses and the number of reams used by staff members; quantitative description of the percentage of digital publications per year; amount of recycled paper used per staff member annually; number of prints per staff member each year, among others.

- **Regarding general waste:** Identify whether there are recycling bins; quantify in kilograms the amount of waste generated per staff member; quantify in kilograms the monthly amount of recycled material by type; describe the procedure and materials used by the cleaning service provider in the offices; indicate the presence or absence of a collection point for hazardous waste segregation, among others.

- **Regarding water usage:** Identify the amount of water used per staff member annually; check and record the condition of restrooms and water lines; identify the chemical composition of the cleaning products used, among others.

- **Regarding electricity usage:** Identify annual electricity consumption; describe elevator usage by recording the total number of trips through sampling of destination and frequency; develop a cadastre of computer equipment and electrical appliances present in various offices (heaters, kettles, lighting fixtures, fans, etc.); create a report on usage time (hours–minutes) of computers, lights, and air conditioning by floor, and on staff absence during lunch breaks and at the end of the workday, among others.

- **Regarding transportation:** Count the number of hybrid vehicles (if any) and conventional vehicles; indicate the existence of a policy promoting bicycle use and carpooling; evaluate the space allocated for bicycle parking in relation to staff demand (via surveys); specify annual fuel usage, differentiating between oil, gas, and gasoline. In the case of gas usage, measurement should be in cubic meters; conduct origin–destination surveys among staff members, among others.

- **Regarding Huella Chile:** Indicate whether the Museum is registered in the Huella Chile program or its equivalent, and whether it holds any accreditation, among others.

- **Regarding Sustainable Purchases and Circular Economy:** Indicate whether there is a sustainable public procurement policy, in accordance with the guidelines provided by ChileCompra; mention whether the following products or services include sustainability criteria in their acquisition: certified electronic equipment, cleaning chemicals, paints and varnishes, computers, food, among others. Include use of certification seals (e.g., for women-led businesses, pro-SMEs); indicate if there are measures in place for services that avoid disposable items and discourage purchasing products in single-use containers, etc.

- **About Internal Environmental Education:** Indicate whether there are formal internal induction processes for employees on topics such as recycling, water conservation, energy efficiency, among others. Also mention whether there is informative signage in the workplace promoting awareness of these topics. Additionally, include staffing levels, specifying plant, contract, fee-based, Labor Code, or other hiring modalities. This information should be broken down by gender and category (Managers, Professionals, Technicians, Administrative, and Auxiliary staff).

- **Regarding Disposal of Movable Property:** Indicate the procedure established for movable property that is destroyed, deteriorated, or technically obsolete.

During the first stage, the initial audit was carried out in July as part of the pre-accreditation process. Representing the Museum, Technical Coordinator Cinthia Mora Troncoso participated. The audit team included professionals from the Ministry of the Environment, the Regional Ministerial Secretariat of Valparaíso, and an external auditor.

At this stage, the expected progress range set by the MMA (Ministry of the Environment) was between 40% and 60%. However, the Museum achieved 92% progress, an outcome that, for the MMA, represented a strong indicator of confidence in granting the respective pre-accreditation.

According to what was issued in Ordinary No. 444/2021 by the Ministry of the Environment (MMA):

- "The commitment to implementing the program is highlighted, as the Museum is highly active in its work, which is reflected in the planning of actions focused on the efficient use of resources. For example, the use of digital formats for most administrative documentation has enabled a reduction in paper consumption."
- "The efforts of both staff and authorities are valued, demonstrating a proactive and purposeful attitude aimed at generating the necessary changes in environmental matters. This seeks to promote and develop a culture of sustainability, both individually and collectively, a condition that supports strong performance in the development of the program."
- "It is noted that the Museum has established partnerships and collaborative work with other institutions, such as the Regional Ministerial Secretariat of Energy (Seremi de Energía), who are assisting by providing recommendations, identifying possible solutions, and suggesting measures to be implemented in terms of energy efficiency within the facilities."

During the first stage of the program, which took place in 2021, a total of seven training courses on environmental topics were conducted, mostly in virtual format due to the public health situation. These training sessions were directed not only to Museum staff, but also to other regional institutions, Regional Directorates, and the National Director, as mentioned earlier in this chapter.

Additionally, the Museum facilitated the participation of speakers from external institutions, who contributed to a collaborative effort that enabled the sharing of cross-cutting knowledge. This approach helped strengthen the team and better prepare them for the challenges of the process.

Work also began in collaboration with technical professionals from the Regional Ministerial Secretariat of Energy (Seremi de Energía), who conducted a study on the Museum's energy efficiency. The goal was to provide recommendations aimed at promoting behavioral changes, the adoption of improved technologies, and the long-term feasibility of installing photovoltaic panels.

During this period, there was significant collaboration from the committee members in the process. Progress was made in the development of protocols with participation from various Museum departments. This included the Document Management Manager, who contributed to the development of efficient paper-use strategies; the Science and Research Department Manager, who provided documentation to improve the printing system; and the Extension Department, which ensured continuous

updates to the Museum's official website and social media, incorporating information about sustainable management practices and progress in the Estado Verde Program.

Although John Juger Vivian Cordero, Manager of the Scientific Library, had reached an agreement in March 2020 with *Green Libros* to collect books and school texts in order to encourage and promote reading, the initiative was paused due to the public health situation. It was resumed in 2021.

That same year, efforts began to establish collaboration agreements, starting with ECOANDES, a recycling company based in Valparaíso, Chile. Materials collected included wood, metal scraps/cans, PET 1 and HDPE plastics, plastic bottles, cardboard, white printed paper, and office files (stationery). An alliance was also formed with the National Maritime Museum of Chile (Museo Marítimo Nacional) to collect plastic bottle caps for the *Damas de Café* initiative. This program helps raise funds to provide accommodation in Santiago for children from across the country undergoing cancer treatment. By the end of the year, eight recycling bins were acquired, enabling recycling campaigns involving both museum staff and visiting members of the community. This initiative promotes waste recovery, thereby extending the lifecycle of materials by reintroducing them into the production system and preventing their disposal in landfills, even in the best-case scenario.

In September of the same year, the CEV reconvened to review the diagnostic criteria, the proposed environmental self-management policy, the Annual Environmental Management Plan developed during 2022, and the homologated activities related to environmental protection carried out prior to joining the program. All of the above met the requirements set for the preliminary accreditation application.

On October 15th of the same year, the final file was submitted to the Ministry of the Environment (MMA), and the results are currently pending.

Thoughts On the First Stage

The audit yielded positive results, as the Museum's progress status exceeded the expectations set by the MMA. The success achieved thus far is due, on one hand, to the collaboration of an external network of experts, and on the other, to the active participation and conviction of the members of the CEV, along with the commitment of the entire team.

However, if responsibility and commitment had rested solely on the technical coordinator leading the process, it would have been impossible to carry out the work accomplished to date. Collaboration and commitment from the entire organization are

essential to promote and embed an environmental culture in the short, medium, and long term.

Estado Verde Pre-Accreditation of the Museo de Historia Natural de Valparaíso

In February 2022, the Ministry of the Environment of Chile notified the Museum of the results of its Pre-Accreditation application, stating: *“The Museum optimally complied with the first stage requirements; an outstanding development of the elaborated environmental management plan is projected.”* The final audit report issued by the Ministry further stated: **“The Museum has achieved 100% compliance, exceeding the minimum 90% required to obtain the Estado Verde Pre-Accreditation.”** In summary, the first stage of the process was successfully approved. The next step involves implementing the Annual Environmental Management Plan (EMP) as part of the second stage of the program.

Second Stage

This stage spans 12 months and includes audits to verify whether the planned actions and established commitments have been carried out. The Estado Verde Committee continues to meet bimonthly to assess progress and address any difficulties in implementation.

The plan must include actions and measures for each environmental component in order to eventually obtain full accreditation. The requirements will become more demanding depending on the level of accreditation being pursued.

The following elements must be included in the plan:

- Institutional Environmental Policy, approved by resolution.
- Performance and compliance report, covering aspects such as recycling, water management, paper usage, energy management, transportation, sustainable procurement, and disposal of movable property. Supporting documentation must be attached.
- Huella Chile registration record.
- Training report for staff, including topics covered, photographs, and attendance lists.
- Internal communication campaign report, with supporting evidence such as photographs and announcements.
- Report on the internal dissemination process and updates to the Museum's website.

Implement an Environmental Management Plan (EMP)

The annual plan was implemented in 2022, addressing 11 environmental aspects, and incorporating 17 measures and 20 goals to be achieved.

The challenge was significant; however, the team's alignment, realism, and conviction were essential in obtaining positive results.

While the Museum's internal team led the development of the plan, it was also necessary to rely on the collaboration and participation of external professionals for various reporting activities related to environmental issues, energy efficiency, and water availability challenges, among others. Technical advisory support was provided by professionals from the Regional Ministry Secretariat (Seremi) of Energy, the Environmental and Sustainability Department of the University of Valparaíso, and the Seremi of the Environment.

Developing an Internal Environmental Management Policy with Workers' Participation

The Environmental Self-Management Policy was officially established in February 2022 through Exempt Resolution No. 037. The objectives of this policy are as follows:

- a. Comply with current environmental regulations applicable to the activities carried out by the Museum.
- b. Empower workers on environmental issues, promoting habits that encourage respect for and care of the environment.
- c. Promote the responsible and efficient use of electricity, water, and materials.
- d. Foster a circular economy by applying sustainable criteria in procurement processes and service tenders.
- e. Encourage reuse, repair, and recycling through the development of agreements and partnerships.
- f. Implement environmentally friendly technologies.

Purposes, Measures, and Goals by Environmental Area

1. Environmental Self-Management Policy

Purpose: Integrate the environmental variable into all work processes.

The environmental policy is shared with Museum staff via email and published on the Museum's website⁹ under the *Environmental Management* and *Estado Verde* banners.

⁹ <https://www.mhmv.gob.cl/noticias/museo-de-historia-natural-de-valparaiso-impulsa-politica-de-autogestion-ambiental>

Measures / Actions

Incorporate environmental considerations into all work processes.

Goal

Develop an internal environmental self-management policy in a participatory manner.

2. Paper Usage

Purpose: Ensure efficient and responsible use of paper.

Measures / Actions

- Continue using paper sourced from sustainable forest management.
- Develop a paper-use protocol that promotes efficiency, including guidelines for printing/photocopying (e.g., double-sided printing, reuse of single-sided sheets), and maintain recycling practices.

Goal

- Use 100% sustainably sourced paper.
- Disseminate the protocol to 100% of staff.
- Reduce the total number of annual printouts by 5%.

3. Waste Management

Purpose: Add value to discarded materials by promoting recycling.

Measures / Actions

- Establish a collaborative agreement with a local recycling company.
- Separate recyclable materials (PET bottles, cardboard, batteries, among others).
- Implement a hazardous waste storage area.

Goal

- Formalize a recycling agreement.
- Ensure regular collection of recyclables.
- Store hazardous waste in a proper facility, in compliance with Supreme Decree No. 148.

4. Water Management

Purpose: Maintain efficient and responsible water consumption.

Measures / Actions

Upgrade valves and WC fixtures, replacing at least 50% of existing units.

Goal

Launch the bidding process for the sanitary fixture improvement project (bathrooms).

5. Power Management

Purpose: Maintain responsible and efficient electricity use.

Measures / Actions

Develop a *pilot lighting operation scheme* that establishes seasonal usage schedules.

Goal

Disseminate the scheme to all staff.

6. Transportation

Purpose: Reduce the Museum's carbon footprint.

Measures / Actions

Promote the use of bicycles.

Goal

Implement bicycle parking for staff and visitors.

7. Huella Chile (Chile Footprint Program)

Purpose: Conduct a greenhouse gas emissions diagnosis.

Measures / Actions

Register the Museum in the *Huella Chile* Program.

Goal

Provide training sessions on the program and its methodology.

8. Sustainable Purchasing and Circular Economy

Purpose: Promote sustainable purchasing practices and foster a circular economy.

Measures / Actions

- Create a protocol for sustainable public procurement, considering product/service lifecycle, repairability, reusability, recyclability, and compliance with energy efficiency standards.
- Formalize a commitment to avoid purchasing single-use packaged products.

products.

Goals

- Disseminate the memorandum of protocol approval.
- Implement the protocol during 2022.
- Ensure that 100% of staff are informed.

9. Environmental Education

Purpose: Encourage knowledge and practices related to environmental issues.

Measures / Actions

- Maintain a recurring cycle of lectures and training sessions.
- Design and display informational posters.

Goals

- Hold at least 4 lectures/training sessions annually.
- Create and display at least 3 informational posters per year.

10. Disposal of Movable Property

Purpose: Avoid waste generation and promote the extension of the useful life of materials and equipment.

Measures / Actions

- Develop a protocol for the disposal of movable property that encourages recycling and donation of items.

Goals

- Disseminate the memorandum of approval.
- Ensure staff are informed of the procedure.

11. Communications Campaign

Purpose: Keep staff and visitors informed about upcoming challenges and the processes being carried out.

Measures / Actions

- Publish updates and reports on the Museum's official website.
- Create posters and/or signage on environmental topics directed at both visitors and staff.

Goals

- Publish at least 3 updates per year on the *Environmental Management* banner, the official website, Instagram, and Facebook.
- Design and display at least 2 posters or environmental signs per year.

Results of the Annual Plan Implementation

The Annual Environmental Management Plan was developed during 2022, involving intense and continuous work with the collaboration of the entire Museum team. The methodology used was fully participatory, enabling the gathering of information and the gradual and realistic formulation of measures and goals, always within the organizational context. It is important to understand that this is a progressive process, as it involves adapting to a new working model where planning standards are integrated into Museum operations, with the aim of strengthening a sustainable culture.

Several actions were designed and implemented as part of this first annual plan. Some notable examples include:

1. Operation of the Estado Verde Committee

Bimonthly meetings were established, along with the reinforcement of actions and measures from the annual environmental management plan, which are to be addressed in each team meeting.

2. Creation and dissemination of environmental self-management policy

The policy was created and approved in a participatory manner, and disseminated both internally and to the community. It is available at the Museum's entrance and under the "Environmental Management" banner on the official website¹⁰.

3. Efficient use of paper

- A diagnostic determined that each museum employee uses 0.4 reams of paper per year, which is significantly below the central government's average annual consumption of 11 reams per employee.
- A new protocol for the efficient use of paper was created and disseminated, promoting the use of Word tools to avoid misprints. It was also decided to print only essential documents, with most documentation to be handled digitally.
- Paper use continues with forestry management certification.

4. Waste management

To establish partnerships with recycling companies, the following agreements were made by 2022:

ECOANDES¹¹: A coastal enterprise that collects color and black-and-white printed paper, PET and HDPE plastics, magazines, books in poor condition, tickets, posters, used oil, scrap, wood, and iron.

Entel Recicla and MIDAS: Handle small electronic waste such as headphones, cell phones, tablets, remote controls, batteries, decoders, chargers, among others¹².

National Maritime Museum Alliance¹³: Collects all types of plastic bottle caps. These are delivered to *Damas de Café* (Coffee Ladies), who both help reduce plastic waste and fund lodging for children undergoing cancer treatment in Santiago. The collected caps include those from shampoo, conditioner, creams, deodorant, oil, markers, etc.

¹⁰ <https://www.mhmv.gob.cl/noticias/museo-de-historia-natural-de-valparaiso-impulsa-politica-de-autogestion-ambiental>

¹¹ <https://www.mhmv.gob.cl/noticias/retiro-de-material-destinado-reciclaje>

¹² <https://www.mhmv.gob.cl/noticias/campana-de-reciclaje-electronico-y-compromiso-con-el-medio-ambiente-se-suma-al-trabajo>

¹³ <https://www.mhmv.gob.cl/noticias/museo-de-historia-natural-de-valparaiso-celebra-143-anos-con-campana-de-reciclaje>

Green Libros¹⁴: Collects books in good condition to support educational initiatives that promote reading and improve access to books in vulnerable communities¹⁵. In the past year, 1,333 books were collected with the support of the community.

RetroCicla¹⁶: Collects clothing in good condition to extend its life cycle, including jeans, wool, polyester, cotton, linen, silk, leather, eco-leather, and viscose.

A permanent recycling and reuse point has been implemented at the Museum's Nina Ovalle Hall. This initiative is particularly impactful given the shortage of *puntos limpios* (clean recycling points) in the Valparaíso municipality, many of which have deteriorated into informal dumps. Thus, this action strengthens and facilitates recycling as a good practice for the community.

Total Recycling – 2022

Cartons

- 106 kg (233.68 lbs)
Includes cartons and packaging materials.

School texts in bad condition, magazines, leaflets, notebook sheets, cardboards, tickets

- 592 kg (1,305.13 lbs)

Printed white paper

- 125 kg (275.57 lbs)

PET1 plastic

- 30 kg (66.14 lbs)

HDPE plastic

- 11 kg (24.25 lbs)

Iron items / Scrap

- 306 kg (674.61 lbs)

¹⁴ <https://www.mhmv.gob.cl/noticias/museo-de-historia-natural-de-valparaiso-realiza-donacion-green-libros>

¹⁵ <https://www.greenlibros.com/pages/sobre-nosotros>

¹⁶ <https://www.mhmv.gob.cl/noticias/punto-de-reciclaje-y-reutilizacion-del-museo-suma-contenedor-para-residuos-textiles>

Wood

- 90 kg (198.41 lbs)

Electronic waste

- 24 kg (52.91 lbs)

Plastic caps

- 34 kg (74.95 lbs)

Clothes

- 42 kg (92.59 lbs)

A total of 1,359 kg (2,996.08 lbs) of materials were recycled.

Implementation of Hazardous Waste Storage (RESPEL, for its initials in Spanish) In October of the same year, the Museum acquired a hazardous waste storage facility, which was essential due to the presence of wet collections. These collections require chemical products to preserve biological material, and when the preservation liquids are replaced during maintenance, hazardous waste is generated. This waste is temporarily stored in the RESPEL warehouse, and before reaching its storage capacity, its final disposal is managed in accordance with current regulations (D.S. No. 148).

5. Water Management

In March 2022, the provinces of San Felipe, Quillota, and Los Andes, in the Valparaíso region, were declared to be experiencing water scarcity¹⁷. Therefore, maintaining efficient and responsible water consumption became a priority. At the Museum, many fixtures (toilets and faucet handles) were leaking or malfunctioning up until 2021, so most were replaced. They are now subject to periodic inspections to detect and repair any issues promptly.

6. Energy Management

The aim was to ensure efficient and responsible use of electricity. To achieve this, a pilot energy efficiency plan was developed with the support of professionals from the Regional Ministry of Energy in Valparaíso. Two sessions of talks and workshops were held to encourage the participation of the entire Museum team and to collaboratively agree on realistic, inclusive measures. To monitor adherence to the protocol, checklists

¹⁷ <https://dga.mop.gob.cl/noticias/Paginas/DetalleNoticias.aspx?item=835>

are used. While changes in energy use habits have been positive so far, continuous reinforcement is necessary.

7. Transportation

The main goal is to reduce the Museum's carbon footprint. To support this, a bicycle parking area was installed for staff and visitors. The rack, located in the Museum's courtyard, has been available since July 2022 and was donated by the Museum's partner, ECOANDES.

8. Sustainable Procurement and Circular Economy

The first step was to create and disseminate a protocol for sustainable public procurement. This protocol considers product life cycles, the possibility of repair and reuse, recyclability, and prioritizes items with energy efficiency standards. The second measure was to formalize a commitment to avoid single-use packaging. For example, during coffee breaks at the Museum, the use of reusable tableware, compostable and/or biodegradable materials, and healthy food options is prioritized.

9. Decommissioned Movable Assets

A protocol was established that rejects the option of destruction and prioritizes donation. If the goods are non-functional, materials must be recycled to reduce or avoid waste generation.

In 2022, four desktop computers were donated to the Santa Ana Community Space, located in Cerro Cordillera, Valparaíso. In this case, the decommissioning protocol was applied, with donation as the prioritized option. The computers were delivered in working condition and with the necessary software installed.

10. Huella Chile

The purpose of Huella Chile is to promote the quantification, reporting, and management of corporate greenhouse gas (GHG) emissions in both the public and private sectors. As part of the program's requirements, the Museum team participated in training sessions conducted by the Huella Chile team and successfully registered the Museum in the platform.

The next challenges include continuing with training activities to measure the Museum's carbon footprint. In parallel, progress has already been made toward implementing measures aimed at mitigating the footprint.

11. Campaña Comunicacional (Communication Campaign)

The Communication Campaign focuses on maintaining visibility of environmental actions through two banners on the Museum's official website: Environmental Management and Estado Verde. These sections include articles, updates, and reports on the actions taken.

Additionally, posters and signage are created to promote awareness about the different initiatives, such as recycling campaigns and the efficient use of water and electricity, among others.

Website structure for reference¹⁸:

History

- Mission
- Team

Sustainable Museum

- Estado Verde
- Environmental Management

Scientific Library

- Bibliographic Collection
- Publications
- Annals

Education Department

- Children's Imaginaries
- Reading Promotion Room
- Innovation Contest

Science and Research Department

- Archaeology Area

12. Inner Environmental Education

Throughout the year, six internal training sessions were carried out, coordinated by the Head of Environmental Management and the Technical Coordinator. In addition, the Museum participated in a training program organized by the Ministry of the Environment (MMA, for its initials in Spanish), attending five of the sessions held between September and November.

¹⁸ For more information, visitors can scroll to the bottom of the Museum's website, where the banners for each team and section are located.

Topics addressed included:

- *No Trash*
- *Biodiversity Lecture*
- *Water Saving Workshop*
- *Energy Efficiency Workshop*

Reflection

The implementation of actions and measures from the annual environmental management plan enabled the Museum to become the first State Museum accredited at the Intermediate Level of the *Estado Verde Program*. This important milestone drives us to continue improving and take on new challenges toward achieving the Excellence Level accreditation. These efforts also reinforce the Museum's leadership in building an environmental culture, one that is shared with partner organizations, neighbors involved in the circular economy, and most importantly, our visitors, whom we encourage to engage in actions focused on protecting, preserving, and understanding our natural and cultural heritage.

Sustainable Development Initiatives and Activities

This section highlights a series of sustainable development initiatives and activities carried out by the Museum between 2019 and 2022. These efforts addressed a wide range of topics from inclusive, social, environmental, and cultural perspectives. Their common purpose: to learn about, care for, and respect our planet, under the principle that “*we are part of nature.*”

All activities were developed by transdisciplinary teams, involving Museum staff as well as numerous external collaborators.

Highlighted initiatives include:

Revista Anales (Annals Magazine)

Originally launched in 1968 under the direction of Nina Ovalle, this scientific magazine was distributed globally in printed form for many years. However, in 2019, aligned with the Museum's commitment to sustainability, the printed version was discontinued due

to its environmental impact (paper use, water, transportation). The magazine is now published exclusively in digital format and is freely available for download.

Book Launch: *La Colita de Mar*

Written by Museum educators Alejandra Baradit and Andrea Vivar, this 2021 publication reflects on how adult-centric perspectives often overshadow children's voices, exploring the complexity of childhood representation and adult-child relationships.

Project: *Mollusca experiencia* (Mollusk Experience)

This initiative addresses the effects of climate change on marine mollusks, especially targeting blind children. It includes an educational kit made from eco-friendly materials, designed to minimize waste and carbon emissions. The kit is freely available online.

Sustainability Networking (2021)

The Museum promoted regional collaboration through a series of visits, training sessions, interviews, and workshops with other local museums and institutions, sharing knowledge and encouraging the adoption of good environmental practices. Participating institutions included: Museo Baburizza, Museo Fonck, Museo Marítimo Nacional, Palacio Rioja, Artequin, Museo Universitario del Grabado, Museo Histórico de Placilla, and Edificio Verde (University of Valparaíso's *Ciencia Altiro* program).

Participation in International Macrotrash Sampling (2021)

The Museum took part for the first time in the *International Macrotrash Sampling on Sand Beaches* at Playa San Mateo, Valparaíso. This activity is part of the “*Científicos de la Basura*” (Garbage Scientists) program, which brings together students, teachers, and researchers to study coastal waste since 2007.

Documentary and Water Talks

Water as a critical resource was addressed through the screening of the documentary *Agua, Raíz de la Vida* (Water, Source of Life) and a series of expert-led panels held on World Water Day.

“Museo en el Barrio” (Museum in the Neighborhood) – 2022

This outreach program brought Museum experts and collections directly to local parks and hills of Valparaíso, reaching a total of 1,139 participants. It included mobile exhibits of biological and proprietary collections.

Scientific Illustration Project

Led by the *Mar y Ciencia Foundation* in collaboration with the Museum, this initiative provided training in scientific illustration using pencil and watercolor. The resulting exhibit included inclusive elements for blind visitors, such as braille and tactile relief plates.

World Oceans Day Activities

In collaboration with organizations such as Pitra, Vamos Volar, Libro Verde, Pintarroja, Fundación Mar y Ciencia, and others, the Museum hosted a variety of events including documentary screenings, workshops, talks, and exhibitions. These aimed to foster reflection and action for climate change adaptation and resilience.

In its effort to build sustainable and inclusive community ties, the Museum's Education Department, in collaboration with the Functional Diversity Office of the Valparaíso City Hall, has developed various participatory workshops and guided tours. These activities have explored themes such as “**Heritage: What I Care For, What I Love, What I Preserve**” and “**Secrets of the Birds**”. The overarching goal is to make natural and cultural heritage accessible to all, including people who are blind, deaf, with reduced mobility, or psychiatric patients from Salvador Hospital.

In September, the Museum took part in the celebration of the “Traditional Circus”, co-organizing a panel discussion with **Fundación Circo Museo** (Circus Museum Foundation). The event brought together experts and key figures from the field to present the origins of the Traditional Circus in Valparaíso, highlighting the journey toward its recognition as National Intangible Cultural Heritage. In November, professionals from several Museum departments, Scientific Library, Science and Research, Education, and Intangible Cultural Heritage, carried out a series of training sessions for Fundación Circo Museo. The aim was to provide tools and knowledge to support the preservation and enhancement of circus tradition.

In October, the Museum celebrated both **Science Month and its Anniversary**, organizing a series of activities for the general public to promote appreciation of cultural and natural heritage.

One of the key topics addressed was the negative environmental, economic, and social impacts of the fast fashion industry. The Head of Environmental Management participated in the activity “**Fast Fashion Exhibition and Its Effect on Climate Change**” held at the Liceo Bicentenario Manuel de Salas in Casablanca.

Aligned with the Museum's commitment to promoting the circular economy, a workshop was also conducted in collaboration with “**La Reparadora**” (The Repairer),

led by María Jesús Gómez. The workshop taught homemade garment repair techniques aimed at extending the life cycle of clothing and valuing the work of those in the repair trade. Throughout the month, other activities included: Scientific talks by external collaborators, Participation of Museum experts in public activities such as the “discovery cart”, among others.

Collaborative work has undoubtedly been one of the key pillars for the Museum's development and progress toward sustainability. In 2022, and in partnership with the Universidad de Valparaíso, through its Environment and Sustainability Unit (UMAS), the Museum began working on one of its long-standing dreams: the creation of a community space called “**Plaza Verde entre Muros**” (Green Square Between Walls). To bring this vision to life, a transdisciplinary team was formed, composed of professors and students from the fields of Environmental Engineering and Architecture, with active participation from the community. Simultaneously, the Museum strengthened its academic collaborations by integrating the theme of climate change and its effects in Chile into training processes. This was approached from an inclusive and cross-disciplinary perspective. As part of this initiative, professors and third-year architecture students from the Universidad de Valparaíso visited the Museum to learn about the biodiversity of Chile’s central zone and how it may be affected by climate change. The visit included a guided tour of the permanent exhibition, and a specialized talk led by Rodrigo Solís, Head of Environmental Management at the Museum, along with Hernán Ramírez Rueda, Regional Secretary of the Ministry of the Environment (Seremi).

The “**Hablemos de lo Nuestro**” (Let’s Talk About Our Heritage) project focused on valuing personal heritage and the life experiences of the elderly through the activation of memory, storytelling, and collective imagination. This initiative, developed between 2017 and 2022, emphasized the cultural significance of everyday objects and promoted their preservation and conservation. As a result, an exhibition was created and installed in the Museum's Heritage Hall.

In November 2022, the Museum, in collaboration with the Ministry of the Environment, hosted the **5th Seminar on Biological Collections** (*V Seminario de Colecciones Biológicas*). This seminar aimed to provide a space for scientists and the general public to share experiences on the importance of biological collections, their role in biodiversity research, the documentation of species, and their contribution to understanding both historical and current natural contexts. These collections serve as a vital resource for scientific knowledge and public education.

Highlighted Initiatives

1. **Book launch:** *La Colita del Mar: Imaginarios Infantiles* (The Tail of the Sea: Children's Imaginaries).
2. **Mollusca Experience:** Inclusive and sustainable co-creation of scientific and educational materials.
3. Promotion of **sustainability and institutional collaboration networks**.
4. Workshop: *¿Cómo construir un herbario?* (How to Build a Herbarium) – raising awareness of native plants and their ecosystems.
5. The importance of **environmental management**.
6. Participation in *Científicos de la Basura* (Scientists of the Garbage) project.
7. Screening of the documentary: *Agua, raíz de la vida* (Water, the Root of Life).
8. *Museo en el Barrio* (Museum in the Neighborhood) – fostering links between heritage and local communities.
9. Launch of the first **braille book:** *Biodiversidad Marina Porteña* (Marine Biodiversity of Valparaíso).
10. Activities in the framework of **International Oceans Day**.
11. Inclusive educational partnerships with the **Functional Diversity Office**.
12. Recognition of the **Traditional Chilean Circus** as **Intangible Cultural Heritage**.
13. Celebration of **Science Month and the Museum's 144th Anniversary**.
14. *Plaza Verde entre Muros* – community-centered environmental design project.
15. *Hablemos de lo Nuestro* – valuing elderly voices and personal heritage.
16. 5th Seminar on Biological Collections – exploring their role in biodiversity research.

Conclusions

In addition, continuous reinforcement of sustainable habits, the creation of interactive educational materials, and the organization of workshops and training sessions are essential. Clear and timely communication, and the establishment of networks with sustainability experts, play a crucial role in ensuring lasting impact.

The goal of the Sustainable Museum is to become a credible and coherent institution, where environmental factors are fully integrated into all processes, while promoting a balanced approach between culture, environment, society, and economy. The Museum also seeks to empower the community by providing knowledge and tools that inspire environmental action, aiming to be a regional reference in sustainability.

The Museum is increasingly recognized as a benchmark in environmental management by the local community. It has been invited to trainings, interviews, and workshops, and its experiences and actions have been validated and shared with other museums and institutions.

As part of the Servicio Nacional del Patrimonio Cultural (National Cultural Heritage Service), the Museum believes that taking the first step towards a paradigm shift, and aligning its practices with the Sustainable Development Goals (Agenda 2030), has become one of its distinguishing attributes.

With the publication of this first Sustainability Report, we hope to inspire other public institutions to join this challenge, adopting more efficient, conscious, and responsible practices, always keeping in mind the urgency of mitigating environmental impacts and promoting a culture of respect, care, and protection of our natural and cultural heritage.

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Working Toward a Sustainable Museum

In our commitment to promoting a sustainable culture, this publication is offered free of charge and exclusively in digital format through the Museum's official website. We discourage printing to help reduce the consumption of ink and paper, thereby minimizing environmental impact.

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