



Sarufutsu Forest in Hokkaido

Oji Group TNFD REPORT 2024



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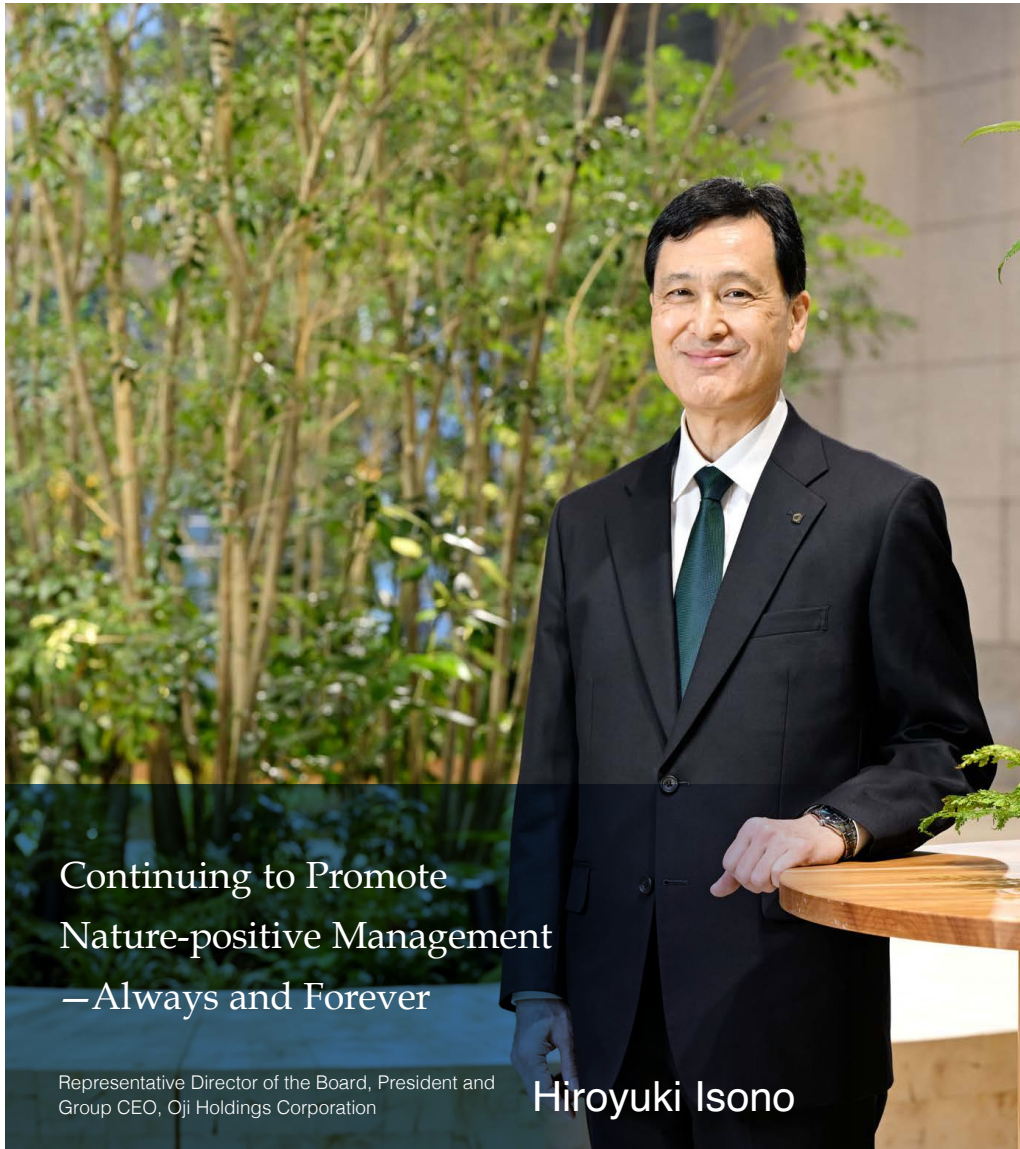
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CEO Message



Continuing to Promote
Nature-positive Management
—Always and Forever

Representative Director of the Board, President and
Group CEO, Oji Holdings Corporation

Hiroyuki Isono

Forest Resources Are Oji's Management Foundation Long-standing Experience and Track Record in Forestation

Even though wood is a sustainable resource that we can produce, forest plantation is a time-consuming business, with the complete planting to harvest cycle requiring around 10 years for hardwoods and 50–60 years for softwoods. Nevertheless, we have a specialized organization that has developed human resources and worked diligently to cultivate our forests.

As a result, we sustainably procure wood resources that are traceable, managed appropriately, and used to develop eco-friendly bio businesses.

Paper Manufacturing Begins with Forestation Sustainably Managing Forests Since 1930

It has been 150 years since Eiichi Shibusawa established Shoshi Kaisha, a paper manufacturing company, with the aim of domestically producing modern paper to advance Japan's cultural progress in 1873. After establishing technologies to manufacture paper using wood resources as raw materials, the company expanded into Tomakomai, Hokkaido, and Sakhalin in search of abundant wood resources to support mass production.

In the 1930s, long before the word “sustainable” became widespread, Ginjiro Fujiwara, the company's president at the time, was aware of the fact that the business could not be sustained simply through the use of timber resources. Accordingly, he set forth the principle that “those who use trees have the responsibility to plant trees,” and aimed to secure wood resources through sustainable forest management incorporating forest plantation.

This is a consistent idea that remains at the core of our business today.

CEO Message

Engaging in Lively Dialogues with Stakeholders, Our Responsibility as a Company Utilizing Forest Resources

It is said that humanity is currently exceeding “planetary boundaries,” which are the limits of the burden human activities can place on the Earth. The rate of change in the environment surrounding forests has also accelerated in recent years, and there has never been a time when action on a global scale has been more necessary than it is now.

As a company that utilizes forests, which are one of nature’s great gifts, we have always believed it our responsibility to ensure the coexistence of humans, other living things, and nature, while managing business in a way that balances the enhancement of corporate value with nature restoration.

In September 2023, the Task Force on Nature-related Financial Disclosures (TNFD) announced its final recommendations for a corporate disclosure framework related to nature, and Oji was among the first to endorse the aims of these recommendations, registering as a TNFD Adopter in January 2024.

This report primarily assesses and discloses information on nature-related dependencies, impacts, risks, and opportunities in line with the TNFD recommendations’ LEAP approach.

We hope this approach will facilitate an understanding of our consideration for forests and other gifts of nature, as well as our nature-positive management policies, and lead to further dialogues with investors and other stakeholders.

Nature-positive Management Initiatives

(1) Visualizing Forest Value and (2) Creating a Collaborative Global Structure

Next, I will introduce two nature-positive management initiatives.

First is a forest valuation of approximately 550 billion yen (company-owned forests in Japan).

We are engaged in “visualizing forest value” as natural capital.

In addition to producing wood, forests offer a variety of other value, including biodiversity and water resources. As a move toward the introduction of what is known as natural capital accounting, readers might be aware that discussions have begun both in Japan and overseas regarding the economic valuation of natural capital.

Accordingly, we calculated the economic value of various of domestic company-owned forest functions, which amounted to approximately 550 billion yen per year, underscoring the tremendous value in nature.

We have already started working with academia and start-ups to further refine and quantify these valuations, and in the future, we want to take on the challenge of maximizing these values.

The second initiative is participation in the ISFC

Oji is proactively involved in the creation of global partnerships and frameworks that transcend industries and countries. In September 2023, the International Sustainable Forestry Coalition (ISFC) was established in conjunction with forestry-related companies throughout the world.

Global collaboration is essential for addressing biodiversity and other global issues, and we will continue to speak out alongside its member companies at COP and other international conferences.

The Oji Group has also joined the World Economic Forum and will contribute to creating a global framework for the transition to a circular bioeconomy society.

Further Advancing “Nature-Positive Management” Focused on the Next 150 Years

We believe that promoting nature-positive management based on the sustainable forest and business operation management principles we have practiced since our founding will lead to further enhancement of corporate value.

Alongside stakeholders, we will continue taking on the challenge of realizing a hopeful future for the Earth through the realization of our purpose.

The Oji Group will continue taking steps forward for forests and the planet with the aim of creating a world that shines blue and is enveloped in green.

With Forest, For the Planet... Oji Holdings

Disclosure Requirements

In response to the adoption of the Kunming-Montreal Global Biodiversity Framework (GBF), engagement with investors such as Nature Action 100 and other stakeholders on nature and biodiversity issues, and the publication of recommendations by the Taskforce on Nature-related Financial Disclosures (TNFD), Oji Holdings registered as a TNFD early adopter in January 2024. The purpose of this report is to disclose nature-related Oji Group information to stakeholders in line with the TNFD recommendations.

The TNFD recommendations set out four pillars of disclosure recommendations, comprising Governance, Strategy, Risk and Impact Management, and Metrics and Targets, as well as six general requirements that cut across the four pillars.

This section explains how this report meets these general requirements.

■ Six General Requirements

The application of materiality	Material items were selected based on the expected financial effects of nature-related issues, as well as with consideration for the significant impact our business activities have on local communities.
The scope of disclosures	With regard to forests, which are the core of our business, we evaluated our extensive direct operations, which include resource procurement, manufacturing, and sales, as well as upstream value chains, and have disclosed information focused on our direct forestry and manufacturing operations, which are strongly connected to nature.
The location of nature-related issues	We evaluated business bases around the world using publicly available data including biodiversity importance and water risk, and identified areas where there is a high probability of material nature-related issues. We also conducted a survey of these areas to identify nature-related issues.
Integration with other sustainability-related disclosures	This report discloses only nature-related information in line with the TNFD recommendations; climate-related information in line with the TCFD recommendations is disclosed on our website . We plan to consider the integration of climate-related disclosure in the future, taking into account the mutual effects of natural capital and climate change.
The time horizons considered	Quantitative information covers the period from April 1, 2023, to March 31, 2024, for domestic business, and from January 1, 2023, to December 31, 2023, for overseas business. Information on initiatives and progress is disclosed beyond these periods. Nature-related issues were examined from short- (up to 2025), medium- (up to 2030), and long-term (up to 2050) perspectives.
The engagement of indigenous peoples, local communities, and affected stakeholders	The Oji Group strives to build relationships of trust through dialogues and collaborations with all stakeholders (shareholders and investors, customers, suppliers, employees, the media, local communities, industry associations, NGOs, and others). When conducting business activities in areas with indigenous populations, we respect unique cultures and histories, and observe local laws and internationally recognized rights. We also work with local governments, NGOs, and experts to promote environmental conservation and economic activities in local communities.



Sarufutsu Forest in Hokkaido

CHAPTER 1 Initiatives Related to Natural Capital

In this chapter, we provide an overview of Oji Group initiatives related to natural capital in line with the recommended TNFD four pillars of disclosure: Governance, Strategy, Risk and Impact Management, and Metrics and Targets.

1-1 Governance

Board of Directors Supervision

The Oji Group Sustainability Committee deliberates nature-related dependencies, impacts, risks, and opportunities within its operations and value chain, and the response to them, as well as its commitment to respecting the human rights of all stakeholders, including indigenous peoples, local communities, and affected stakeholders, and stakeholder engagement. These discussions are monitored and supervised by the Board of Directors.

Management Role and Management Process

The Sustainability Committee is chaired by the President of Oji Holdings (Group CEO), who has overall responsibility for sustainability, with directors as committee members (including COMPANY presidents and female outside directors). The committee meets twice a year. Discussions on risks, opportunities, and responses related to sustainability are reported to the Group Management Meeting based on their significance. Matters for which execution decisions have been made are promoted by the Corporate Sustainability Division, which oversees and manages Group sustainability efforts. The Corporate Sustainability Division identifies Group-wide risks and opportunities and works to ensure they are understood throughout the Group, and reports monthly to the Managing Director and twice a year to the Group Management Meeting. Significant risks and opportunities are reported to the Board of Directors based on a determination by the Managing Director.

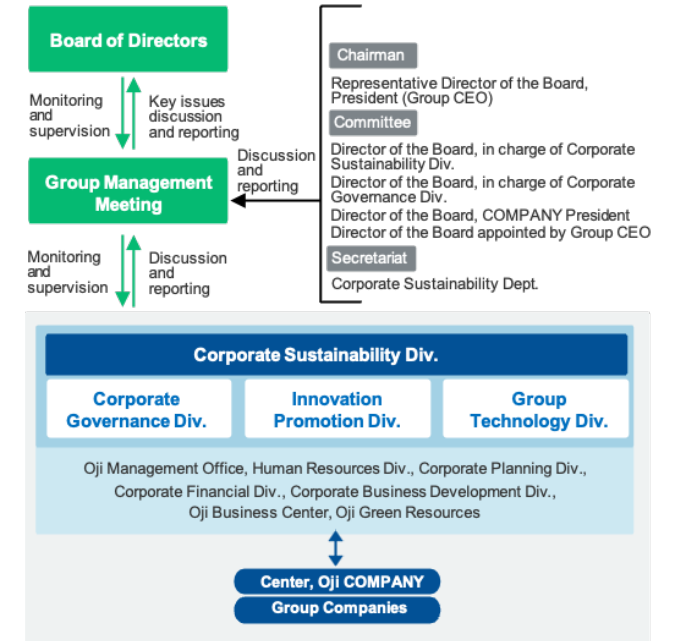
Human Rights Policy and Engagement

The Oji Group established the “[Oji Group Human Rights Policy](#)” and undertakes initiatives to respect human rights in keeping with the Guiding Principles on Business and Human Rights endorsed by the UN Human Rights Council, the OECD Guidelines for Multinational Enterprises on Responsible Business Conduct, and the ILO Tripartite Declaration of Principles concerning Multinational Enterprises. We also adhere to and respect international norms such as the International Bill of Human Rights (the Universal Declaration of Human Rights and International Covenants on Human Rights), the ILO Declaration on Fundamental Principles and Rights at Work, and the Declaration on the Rights of Indigenous Peoples, as well as international human rights, including indigenous peoples’ right to “free, prior, and informed consent.”

We are also working to identify, prevent, and mitigate adverse effects on human rights that might be caused or contributed to by our business activities and their impact on nature, or that might be related to our business, products, or services through business relationships, by conducting ongoing dialogues with stakeholders. We also verify the effects of these actions.

Furthermore, the “[Oji Group Behavior Standard](#)” stipulates that, as a member of the international community, we shall respect the cultures, customs, and values of each country and region, and shall work in good faith and in concert with the people of each country to develop our business.

Sustainability Promotion Structure



1-2 Strategy

Under the long-term vision “[Environmental Vision 2050](#),” the Oji Group is committed to conserving biodiversity and reducing environmental impacts with the goal of achieving Harmony with Nature and Society. In addition, as part of the mid-term targets “[Environmental Action Program 2030](#),” the Oji Group maintains and expands efforts to avoid and reduce biodiversity loss, and conserve and restore ecosystems, contributing to the achievement of a nature-positive world. We are also working to identify, assess, and disclose information on nature-related issues in our business activities and each region.

The identification and assessment of nature-related issues was conducted with reference to the LEAP approach developed by the TNFD. First, we analyzed the interface between the value chain related to forests, the core of the Oji Group’s business, and nature. The results indicated that the forestry business has an especially significant relationship with nature, as it depends on various ecosystem services such as timber and water supplies, climate regulation, and soil quality, and has impact drivers on nature such as land use. Results also indicated that dependencies and impact drivers on water are particularly high in manufacturing operations. Publicly available datasets were used to assess the state of nature at sites engaged in these business activities. We identified forestry operations in CENIBRA (Brazil), company-owned forests in Japan, and 21 manufacturing sites located in areas with high water risk as sites for priority assessment and disclosure.

Forestry at CENIBRA

We analyzed the state of nature in the region and the dependencies and impacts of our business activities on nature, and identified nature-related risks and opportunities. Nature-related risks include unstable supplies of forest

resources and rising costs due to climate change, reduced availability of ecosystem services and strengthened regulations due to ecosystem degradation, and interruption of business activities and loss of assets due to natural disasters. Nature-related opportunities include improving the Oji Group’s reputation and strengthening our competitiveness through the conservation and restoration of natural capital, and increasing demand for renewable resources and nature-based products. The identified risks and opportunities are analyzed in terms of their respective financial effects and likelihood of occurrence in the short, medium, and long term. Two exploratory scenarios have been used for medium- and long-term analysis to prepare for future uncertainties and prevent missed risks and opportunities. We will maintain and promote countermeasures based on the results of this analysis. Targets have been set for reforestation activities, the planting of native tree species, and the establishment of ecological corridors. These are incorporated into the Oji Group’s KPIs for material sustainability issues as we work to achieve our targets.

Forestry in Japan

Our base of operations extends nationwide. We have launched various initiatives to better understand the state of nature where we operate. In 2023, the biodiversity importance in each company-owned forest was comprehensively assessed by considering the overlaps between company-owned forests and Key Biodiversity Areas (KBAs), the number of vegetation types based on the Ministry of the Environment vegetation data, the biota estimated by a species distribution model, and the coverage rate of endangered species in each area. We plan to identify several of these critical forests and conduct field surveys. Currently, a trial survey is being conducted in the Sarufutsu Forest in Hokkaido, through the use of the latest technology of a start-up company and partnerships

with academia. Furthermore, we have launched efforts to quantify the multifaceted functions of forests and calculate their economic value. The economic value of company-owned forests in Japan is estimated at approximately 550 billion yen. With a focus on the future introduction of natural capital accounting, we will consider calculating economic value through collaborations with academia and start-ups. In each region where we conduct business, we also work in collaboration with government agencies, environmental NGOs, academic researchers, and local residents to protect and nurture rare plants and animals, and maintain and restore ecosystems. We have participated in the 30by30 Alliance for Biodiversity since its inception in Japan in 2022. The Alliance aims to achieve the international goal of effectively protecting at least 30% of land and ocean (30by30). The Koyagauchi company-owned forest in Kochi Prefecture was certified as a Nationally Certified Sustainably Managed Natural Site by the Ministry of the Environment in 2023 and registered on the World Database on OECMs in August 2024.

Manufacturing Operations in Water Risk Areas

We conducted a water risk survey at 21 manufacturing sites located in areas with high water risks. The results indicate no problems with production or operations at any of the sites, and no water risks were identified. In addition,, surveys of water intake and consumption were used to quantify the intensity of dependency and impact drivers, confirming that both were relatively low. Furthermore, in a scenario where water risks materialize in the future, we assume that operations will be curtailed or suspended. However, sales at these sites account for 4% of the Group’s net sales, thus risks to the overall Group were assessed as low. Nevertheless, we continue making efforts to reduce impacts and risks, and conduct water risk surveys on an annual basis.

1-3 Risk and Impact Management

The forest-related value chain includes forestry and the manufacture, processing, sales, and consumption of pulp, paper, and other products. Of these, we prioritize the assessment and management of forestry, which has a particularly large relationship with nature, manufacturing, and processing. Indeed, processing has a particularly large water-related dependence and impact. The Oji Group forestry and timber resource procurement management utilizes various certification systems and is based on our “[Sustainable Forest Management Policy](#),” “[Wood Raw Material Procurement Guidelines](#),” and “[Sustainability Action Guidelines for Supply Chains](#).” With regard to managing water resources used in manufacturing and processing, we have set a target for the reduction of water intake intensity in our “[Environmental Action Program 2030](#).” and are managing this across the entire Group. We are also working with public-sector agencies on water resource conservation activities and with industrial water providers on formulating plans to reduce usage.

In addition, we consider regional characteristics when identifying nature-related issues. To identify regions throughout the world where there is a high probability of material nature-related issues, we are conducting research using publicly available datasets on the importance of biodiversity, biodiversity significance areas, biodiversity intactness, changes in forest cover, and water risks. Furthermore, we are conducting investigations into actual conditions of the identified areas.

The prioritization of nature-related issues is evaluated based on expected financial effects, taking into account impacts on local communities. Financial effects are estimated from short- (up to 2025), medium- (up to 2030), and long-term (up to 2050) perspectives.

For priority nature-related issues, we established targets for maintaining and improving countermeasures. These targets are incorporated into the Oji Group’s KPIs for sustainability material issues, and progress will be disclosed in the TNFD Report, which we plan to publish annually going forward.

1-4 Metrics and Targets

With regard to forestry operations conducted by CENIBRA, which owns and manages the largest forests in the Oji Group, in consideration of risk and opportunity assessment results and the significant impact on society, we formulated the following three nature-related metrics and targets.

These targets were considered and formulated in line with the LEAP approach, which we implemented with the assistance of KPMG AZSA LLC. Furthermore, following deliberation by the Oji Group Board of Directors, these targets are incorporated into the KPIs for sustainability material issues and managed accordingly. Progress will be disclosed in the TNFD Report, which we plan to publish annually going forward.

■ Metrics and Targets

Metrics	Targets
Area of natural forest restored on CENIBRA-owned land*1	At least 3,000 ha between 2024–2033
Number of native tree species planted on CENIBRA-owned land*2	At least 500,000 seedlings between 2024–2033
Area of ecological corridors formed outside CENIBRA-owned land*3	At least 3,500 ha between 2024–2033

*1 The area where planting and other activities were carried out to restore natural forests lost due to windthrow, fire, etc.

*2 The number of trees planted within the natural forests owned.

*3 The area enclosed by fences to promote the revegetation of degraded lands between fragmented natural forests and to allow wildlife to move freely, in collaboration with landowners.



Animals living in the Sarufutsu Forest in Hokkaido (Northern goshawk, Ezo red-backed vole, and Old world swallowtail)

CHAPTER 2 Identification and Assessment of Nature-related Issues

In this chapter, we discuss the identification and assessment of nature-related issues conducted with reference to the LEAP approach developed by the TNFD.



Sarufutsu Forest in Hokkaido

2-1 Interface with Nature

To clarify the interface between Oji Group business activities and nature, we first organized the scope of the Oji Group's value chain, business activities, and business sites, then used the TNFD-recommended tool ENCORE to identify sectors within the value chain that have a significant relationship with nature. We then used publicly available datasets to examine the state of nature at locations where specified sectors conduct business activities and identified areas that should be prioritized for evaluation, analysis, and disclosure.

2-1-1 Interface with Nature in the Value Chain

Scope of Value Chain

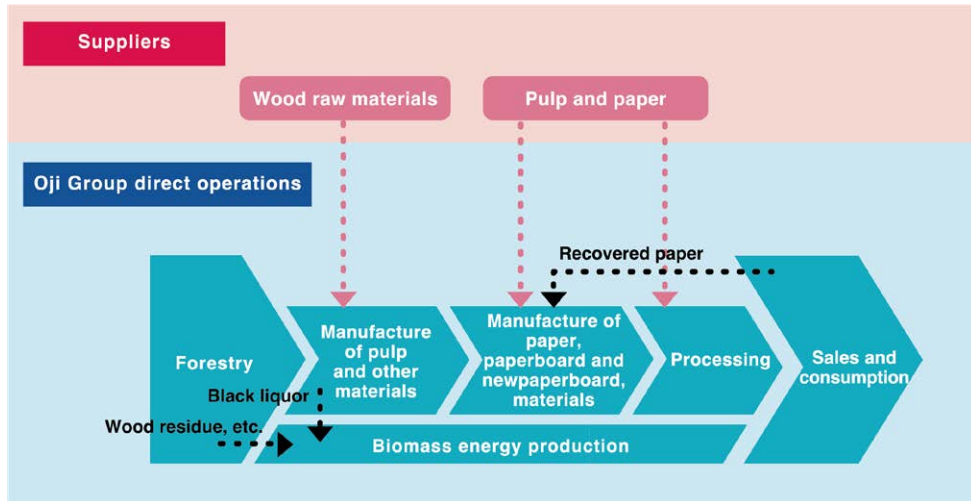
Since its founding in 1873, the Oji Group has been growing through the expansion of its business fields. While keeping abreast of the trends of the times, we have tackled changing social needs and evolved our business structure. We are currently engaged in a diverse array of business fields, but forestry is our core business. The forest-related value chain includes forestry, and pulp and paper manufacturing and processing, sales, and consumption.

The Oji Group's direct operations include forestry, pulp and other material manufacturing, paper, paperboard, and wood-based new material manufacturing, processing, and sales, and biomass energy production using sawmill residue and black liquor. We also make efforts to collect and reuse recovered paper (see [website](#) for details). We procure wood, pulp, paper, and other materials from suppliers.

The Oji Group has business sites throughout the world and is expanding globally, including forest plantation and lumber processing in Brazil, Oceania, and Southeast Asia; packaging materials manufacturing in Southeast Asia, India, Oceania, and Europe; functional materials manufacturing in the United States, Germany, Thailand, and Brazil; and printing and communication paper manufacturing, mainly in Japan.

- [Map of the Oji Group's Direct Operations](#)
- [Map of Wood Chip Suppliers](#)

Value Chain



Business Site Map



[OpenStreetMap](#)

2-1-1 Interface with Nature in the Value Chain

Interface with Nature

We utilize the TNFD-recommended tool [ENCORE](#), which evaluates degree of dependence on nature and the magnitude of impact drivers for each industrial sector, to identify business activities within the forest-related value chain that have a particularly significant relationship with nature. The results are as follows.

- The forestry sector in particular is highly dependent on many ecosystem services. The impact drivers of land use in particular were significant.
- Each manufacturing sector has a particularly high dependence on groundwater and surface water, with significant impacts of water use.
- Biomass energy production is strongly dependent on wood and other materials.

Based on these findings, we decided to prioritize the evaluation of nature-related issues in the forestry sector. We also decided to focus our evaluation on the manufacturing sector, and specifically, on water-related dependencies and impacts.

Dependencies

	Dependencies																				
	Animal-based energy	Fibres and other materials	Genetic materials	Ground water	Surface water	Maintain nursery habitats	Pollination	Soil quality	Ventilation	Water flow maintenance	Water quality	Bio-remediation	Dilution by atmosphere and ecosystems	Filtration	Mediation of sensory impacts	Buffering and attenuation of mass flows	Climate regulation	Disease control	Flood and storm protection	Mass stabilisation and erosion control	Pest control
Large-scale forestry	VL	VH		VH	VH		H	H		H		M		VL			VH	H	VH	VH	H
Production of forest and wood-based products				H	VH					M									M	L	
Production of paper products		M		VH	VH					M							VL				
Paper packaging production												L	L								
Biomass energy production		VH		M	M					M	L	VL		VL			VL		M	L	

Impact Drivers

	Impact drivers					
	Terrestrial ecosystem use	GHG emissions	Water pollutants	Soil pollutants	Water use	Non-GHG air pollutants
Large-scale forestry	VH	H	H			
Production of forest and wood-based products	H	H	H	H		
Production of paper products			H	H	VH	M
Paper packaging production			H	H	VH	M
Biomass energy production	H	H	H	H	H	H

VH	Very High
H	High
M	Medium
L	Low
VL	Very Low

2-1-2 Identifying Priority Locations

Forestry Sector

Forest resources used by the Oji Group are procured from throughout the world. As nearly half are procured from forests owned and managed by the Oji Group, we have decided to prioritize the evaluation and disclosure of direct forestry operations.

Identifying Priority Locations

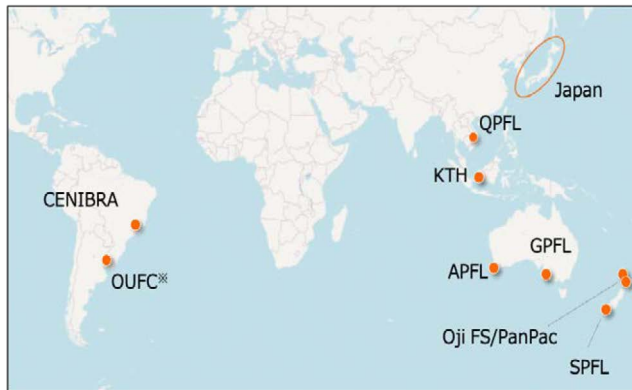
The Oji Group owns and manages approximately 635,000 hectares of forest in seven countries. Excluding the forest of OUFC (Uruguay) newly acquired in July 2024, we assessed approximately 600,000 hectares of forest for size and state of nature in surrounding areas to identify locations for prioritized evaluation and disclosure.

The locations and sizes of each are shown in the figure below. CENIBRA (Brazil) has the largest forest at approximately 250,000 hectares, followed by Japan, with approximately 188,000 hectares.

The state of nature in surrounding areas was assessed using Global Forest Watch, AQUEDUCT, and other platforms and multiple publicly available datasets on the importance of biodiversity, proximity to biodiversity significance area, biodiversity intactness, forest cover change, and water risk. The results are shown in the table.

We prioritized the evaluation of **CENIBRA's forests** and **forests in Japan** because of the large size of these forests and the high importance and integrity of biodiversity in the surrounding areas.

Group Forest Plantations Map



[OpenStreetMap](#)

Note : The forest of OUFC is not included in this assessment as it was newly acquired in July 2024.

State of Nature Assessment Results

Bases			State of nature				
Company	Country	Area (thousands of ha)	Biodiversity importance	Proximity to biodiversity significance area	Biodiversity intactness*1	Forest cover loss*2	Water risk
CENIBRA	Brazil	250	High	High	High	Low	Low
KTH	Indonesia	82	Medium	Low	High	High	Low
APFL	Australia	5	High	Low	High	Medium	Low
GPFL	Australia	3	Medium	Low	High	Low	Medium
Pan Pac, Oji FS	New Zealand	48	Medium	Medium	High	Medium	Low
SPFL	New Zealand	13	Low	Medium	High	Low	Low
QPFL	Vietnam	10	Medium	Low	High	Medium	Medium
-	Japan	188	High	High	High	Low	Medium

*1 Biodiversity intactness indicates the extent to which species and populations are being maintained in the surrounding area. The higher the value, the less change there is, and the healthier their conditions.

*2 Forest cover loss indicates the change in forest cover in the surrounding area since 2000. The higher the value, the more forest cover has been lost.

Oji Group Forest Resource Procurement Management

Direct Operations

All forests owned and managed by the Oji Group are managed appropriately in accordance with the [“Oji Group Sustainable Forest Management Policy”](#).

► Oji Group Sustainable Forest Management Policy

The Oji Group owns and manages vast forests and practices sustainable forest management in harmony with the environment and local communities based on our management philosophy, “Harmony with Nature and Society.”

Our business activities and local communities rely on ecosystem services such as water, climate control and forest products, while our forestry activities impact ecosystems, natural landscapes, and biodiversity. Therefore, we understand our responsibility of managing the forests we own and manage in an environmentally, socially, and economically sustainable way.

Complying with the relevant local, national and regional laws and all relevant international conventions and agreements regarding forest management and based on the applicable internationally recognized principles, we will

1. be complicit in neither deforestation nor illegal logging.
2. safeguard ecological health and functionality and promote sustainable forest and land management practices that aid the conservation of biodiversity, soil, and water resources.
3. respect the human rights of all people, not discriminate or act with prejudice, and never engage in the utilization of child labor or forced labor.
4. respect the unique economic and cultural rights and the legitimate rights of indigenous peoples, including traditional lands and land use.
5. contribute to maintaining or enhancing local communities' social and economic well-being.
6. monitor the condition of forests and the results of management activities, and verify sustainable forest management using tools such as forest certifications.

Suppliers

Wood raw materials procured from outside the Group are managed appropriately in accordance with the [“Wood Raw Material Procurement Guidelines”](#) and the [“Oji Group Sustainability Action Guidelines for Supply Chains”](#). All of these raw materials are FSC™ certified materials (FSC™C014119, etc.), recycled materials or other controlled materials that meet FSC™ requirements, and confirmed 100% traceability. In addition, as stipulated in the Act on Promotion of Distribution and Use of Legally-Harvested Wood and Wood Products (“Clean Wood Act”), we completed registration as a Class-1 and Class-2 Registered Wood-related Business Operator in March 2018. In procuring wood raw materials and biomass fuels, we work with the Japan Paper Association to conduct legally certified due diligence to confirm legality.

■ Suppliers Map



[OpenStreetMap](#)

► Wood Raw Material Procurement Guidelines

The Oji Group requires and verifies that all suppliers produce sustainable wood raw materials. We will implement responsible procurement by surveying wood raw materials from all suppliers to ensure traceability and only purchasing materials from properly managed forests. If the source or forest management status of the purchased wood is unknown or the wood does not conform to the following, we will engage in dialogue with the supplier and request improvements. We will not source from suppliers who do not make improvements.

- a. Raw materials production area (logging area, forest ownership form, differentiation between plantation wood and natural forests)
- b. Forest management method (applicable forestry laws, forest management regulations)
- c. Acquisition status for forest certification
- d. Avoidance of illegal logging (verification of forest certification, harvest permits, records of round logs received.)
- e. Avoidance of genetically modified (GMO) wood
- f. Avoidance of logging in High Conservation Value (HCV) Forests
- g. Avoidance of raw materials associated with major social conflicts
- h. Ensuring the protection of human rights and labor rights

2-1-2 Identifying Priority Locations

Manufacturing Sector

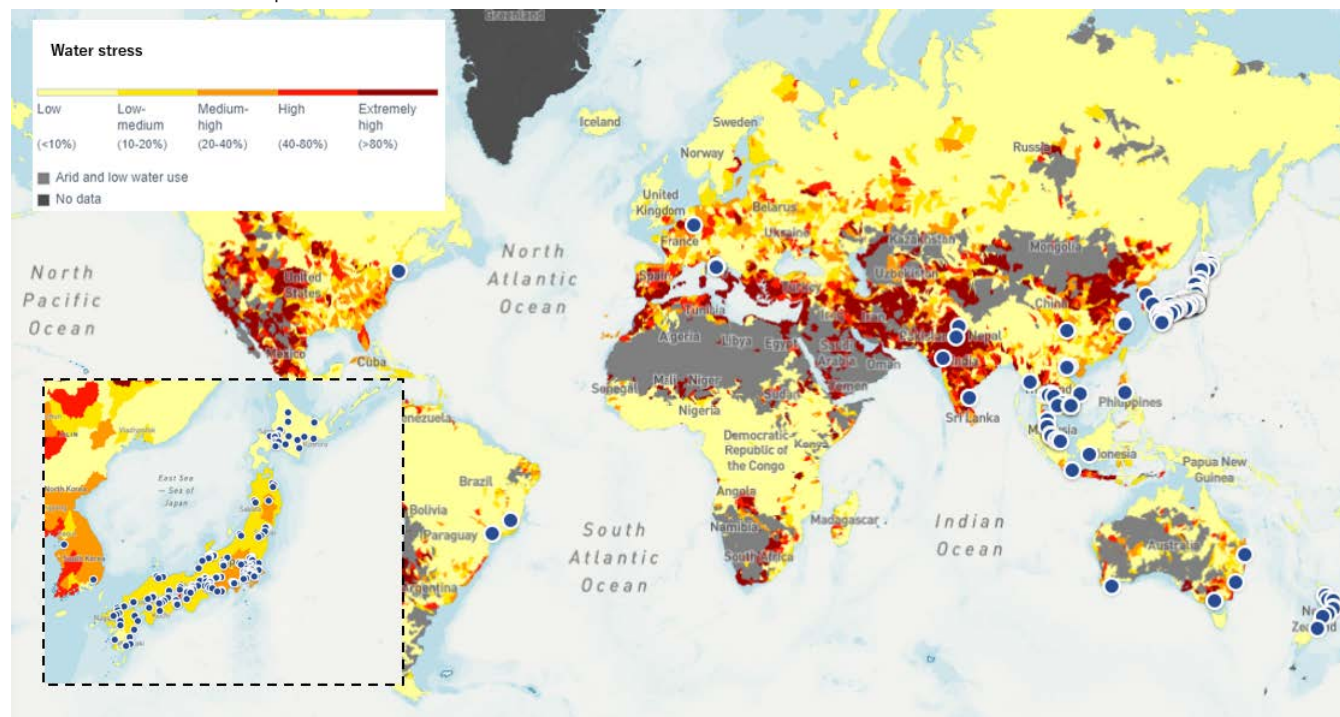
The Oji Group utilizes forest resources to manufacture a wide range of products, including pulp, containerboard, folding cartons, packaging paper, household paper, specialty paper, and printing paper.

Identifying Priority Locations

In the manufacturing sector, which is heavily dependent on water and significantly impacts water usage, we prioritize the evaluation and disclosure of information on operating sites located in areas with high water risk. To survey water risks at each site, we utilized the Water Risk Atlas Baseline Water Stress of the World Resources Institute (WRI) water risk assessment tool "AQUEDUCT." Of the 308 sites surveyed, 21 sites, a relatively small number, were located in areas with Extremely high and High levels of risk.

Extremely high sites are located in Italy, China, Thailand, and India, while the High sites are located in Germany, Indonesia, and Australia. We identified these 21 sites as focal points for the evaluation of nature-related issues.

Water Risks and Sites Map



Source: [WRI AQUEDUCT](https://www.wri.org/aqueduct)

Number of Sites by Water Risk

Evaluation results	Number of sites
Low (<10%) or No data	70
Low to medium (10%–20%)	122
Medium to high (20%–40%)	95
High (40%–80%)	4
Extremely high (>80%)	17

Oji Group Water Resource Management

All Oji Group operation sites have formulated water management plans to manage the amount of water intake and discharge, and the quality and temperature of wastewater. We are also making efforts to conserve water, make effective use of water resources, and reduce our environmental impact. Paper and paperboard manufacturing mills use copious amounts of water throughout the entire production process, including pulp digesting, washing, bleaching, preparation, and papermaking. The water we use in each process is collected and reused after undergoing purification treatment. Furthermore, water used in the final stage of the papermaking process, drying with steam, is also collected and reused (see [website](#) for details).

Environmental Action Program 2030 targets a minimum 6% reduction in water intake intensity by 2030 compared with fiscal 2018.



CENIBRA (Brazil) forest

2-2 Forestry at CENIBRA (Brazil)

CENIBRA, established in 1973 as a joint venture between Brazil and Japan, has consistently practiced sustainable forest management since its inception. In an era where global deforestation is a pressing concern, the approximately 250,000 hectares of vast owned forests have been maintained without reduction for nearly 50 years. In addition, the conservation forests, which make up 40% of this area, have contributed to the maintenance and enhancement of biodiversity.

As a result of these long-term efforts, in August 2024, CENIBRA obtained public certification with its biodiversity conservation activities recognized as having a positive impact that far outweighs the pressures of corporate activities.

This section shows the assessment of CENIBRA's forestry using the LEAP approach.

In August 2024, CENIBRA obtained LIFE certification

As a result of the quantitative assessment using the TNFD recommended tool “[LIFE Key](#)”, it was shown that the positive impact on biodiversity from conservation activities significantly exceeds the pressure on biodiversity from corporate activities. CENIBRA obtained LIFE certification, which proves our contribution to the conservation of natural capital and ecosystem services through corporate activities and biodiversity conservation activities, after undergoing a third-party audit by [TECPAR](#), a public certification body in Paraná, Brazil.

- [For more information, see page 27](#).
- [Audit report by TECPAR](#).



LIFE Certification document

2-2-1 State of Nature

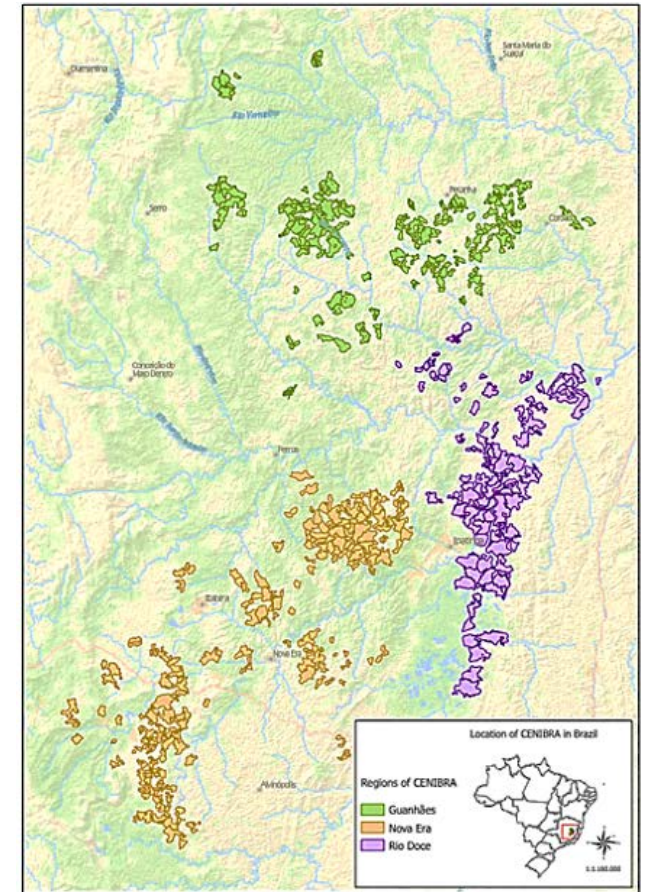
CENIBRA Business Activities and Bases

CENIBRA is an Oji Group company that produces timber through its forest plantation business, which is then used for the manufacture and sales of pulp. More than 30% of the wood raw materials procured by the Oji Group comes from forests managed by CENIBRA.

Based in the state of Minas Gerais, Brazil, CENIBRA manages approximately 250,000 ha of land across 54 municipalities within a biome known as the Atlantic Forest, characterized by high biodiversity and a high proportion of endemic species. It is home to a large human population and serves as a water source for the surrounding area. CENIBRA's forests border three state-protected areas—Doce State Park, Serra da Candonga State Park, and Rio Corrente State Park—as well as the Southern Environmental Protection Area of the Metropolitan Region of Belo Horizonte (APA Sul da RMBH) and 25 municipal nature reserves.

Within the CENIBRA management area, Macedonia Farm is designated as a high conservation value area. Part of this area (560 ha) has been officially designated as a Private Natural Heritage Reserve (RPPN) by the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA).

Map of CENIBRA-owned Forests



Atlantic Forest Characteristics

▸ **High biodiversity importance**

- 20,000 species of plants (40% of which are endemic)
- More than 2,000 species of vertebrates (30% of which are endemic)
- 298 species of mammals (90 of which are endemic)
- 1,023 species of birds (about 200 of which are endemic)
- 475 species of amphibians (286 of which are endemic)
- 306 reptiles (94 of which are endemic)

▸ **Connection to people**

Approximately 150 million people (about one-third of South America's population) live in the Atlantic Forest ecoregion, which accounts for 70% of Brazil's GDP.

A source of water for the surrounding region.

References:

[World Wildlife Fund \(WWF\)](https://www.worldwildlife.org/)

2-2-1 State of Nature

State of Nature

Understanding risks and opportunities related to nature requires a correct understanding of the state of nature at the base of operations and surrounding areas. CENIBRA regularly monitors the state of nature in the forests it manages and responds accordingly.

► Climate

As CENIBRA forests experience distinct dry and rainy seasons with large fluctuations in annual rainfall, CENIBRA has established 10 meteorological stations to collect data on rainfall and temperature, facilitating the implementation of appropriate responses. From 2008 to 2013, high annual rainfall of 1,437 millimeters was recorded in this area, but from 2014 to 2019, annual rainfall was 1,044 millimeters, with consecutive years of rainfall below forecasts. The average temperature from 2008 to 2013 was 19.96°C, and the average temperature from 2014 to 2019 was 20.96°C, indicating an increase in temperature.

► Land Cover

Of the approximately 250,000 hectares of land that CENIBRA manages, approximately 143,000 hectares are eucalyptus plantations and approximately 107,000 hectares are conservation forests, such as permanent conservation areas and legally protected areas. CENIBRA manages its forests in an appropriate manner, and 98% of the land is certified by FSC™ (FSC™C008495) and PEFC. CENIBRA is also making efforts to regenerate forests on degraded land and establish ecological corridors to improve forest coverage and continuity.

► Water Resources and Quality

There are more than 4,500 springs and more than 4,000 kilometers of waterways within the managed area that are protected in accordance with legal standards. The Doce River, which is also the source of water for CENIBRA, is 850 kilometers long and spans 228 municipalities, providing water supply services to around 3.5 million people. In 2015, the water quality of the Doce River deteriorated due to an external factor: the collapse of the tailings pond. In addition, due to the decrease in rainfall, low water levels have been observed at some water intakes during the dry season.

CENIBRA monitors biological indicators in rivers and works to promote biodiversity. Water levels are also monitored at each intake point, and reservoirs are constructed to address water shortages in areas where low water levels are observed. When the water quality deteriorates, CENIBRA implements measures that include restrictions on wastewater discharge.

► Soil Quality

CENIBRA monitors soil fertility and physical characteristics and has observed a decrease in soil organic matter content and physical compaction. In response, it is taking measures that include selecting fertilizers and plowing.

► Biodiversity

Since 2002, CENIBRA has regularly monitored biodiversity in its conservation areas and adjacent protected areas.

Fauna is monitored every six months, and as of fiscal 2023, 639 vertebrate species had been recorded, including 415 bird species, 84 mammal species, 60 amphibian species, 45 reptile species, and 35 fish species. Of these, 45 species (23 bird species, 18 mammal species, three fish species, and one reptile species) are considered endangered, including Mutum (*Crax blumenbachii*), thought to have gone extinct in Minas Gerais in the 1970s, and the buffy-headed marmoset (*Callithrix flaviceps*), one of the 25 most endangered primates in the world.

Flora is monitored every five years, with the most recent survey in 2022 identifying 550 species. Of these, 29 species are considered endangered, including garapa (*Apuleia leiocarpa*), jussara palm (*Euterpe edulis*), Brazilian rosewood (*Dalbergia nigra*), Brazilian sassafras (*Ocotea odorifera*), and brauna (*Melanoxylon brauna*).

In addition, various diversity assessments were conducted incorporating the Shannon-Weiner index, Simpson's index, Pielou evenness index, and Gentsch mixing coefficient, which suggest that species abundance is high and individual distribution is uniform.

■ Categories of Endangerment of Species Observed in CENIBRA's Forests

Endangerment categories		Fauna			Flora	
		MG-COPAM	ICMBio	IUCN	ICMBio	IUCN
CR	Critically Endangered	8	0	1	3	2
EN	Endangered	13	4	5	12	5
VU	Vulnerable	15	18	15	7	7
NT	Near Threatened	n/a	11	16	n/a	4
LC	Least Concern	n/a	606	602	n/a	86

2-2-2 Dependencies, Impacts, Risks, and Opportunities

Dependencies and Impacts Evaluation

Evaluations were conducted to determine how CENIBRA forestry activities depend on and impact nature.

► Dependency Identification and Evaluation

Dependencies on ecosystem services and their pathways were identified as shown in the table on the right. Dependence intensity was measured in terms of input loss, economic loss, and social impact resulting from the loss of ecosystem services.

Timber and water supplies are essential ecosystem services for forestry and directly affect the ability to conduct operations. Climate regulation, soil quality, and water flow regulation are also important ecosystem services.

	Low	Medium	High
Input loss	Production can continue as is or with minor changes	Production can continue if significant changes are made, such as production delays or use of alternative products	Operations are hindered
Financial loss	No possibility of significant impact on profits	Possibility of significant impact on profits	Financial viability might be affected
Social impact	Impacts are temporary and minor	Possibility of substantially restricted access to ecosystem services	Social access and use of ecosystem services could be restricted

■ Dependency Assessment

Ecosystem service dependency	Dependency pathways	Input loss	Financial loss	Social impact
Biomass provisioning	The forestry business directly depends on the growth of trees.	High	High	Low
Water supply	In addition to dependence on water for use in seedling production and dust prevention, it is essential for tree growth.	High	Medium	Medium
Soil and sediment retention	Soil stability prevents trees from toppling over and weakened roots caused by erosion.	Medium	Medium	Low
Flood mitigation	Extreme flooding can affect productivity, but the area has terrain that is not easily affected.	Low	Low	Low
Climate regulation	Temperature, rainfall, and wind speed affect tree growth.	Medium	High	High
Pollination	The tree species used for plantation do not depend on pollination, but the health of the surrounding ecosystem depends on pollination	Low	Low	Medium
Soil quality regulation	Soil fertility and soil structure affect nutrient supply and water retention capacity, which in turn affects tree growth.	Medium	High	Medium
Water flow regulation	Maintaining water flow and water cycles affects the stability of water availability and is necessary for maintaining forests.	Medium	High	High
Disease control	The spread of pathogens could potentially affect human health and livelihoods in the surrounding areas, but there have been no disease outbreaks.	Low	Low	Medium
Pest control	The pest control function reduces the use of pesticides and herbicides.	Medium	Medium	Medium
Bioremediation	Bioremediation contributes to the purification and restoration of the environment by breaking down, reducing, and detoxifying contaminants.	Low	Low	Low

2-2-2 Dependencies, Impacts, Risks, and Opportunities

► Impact Identification and Evaluation

The impact drivers of forestry activities, and their impact on nature, local communities, and business activities, have been identified as shown in the table on the right. Impacts were measured in terms of spatial extent, duration, and magnitude. GHG emissions and absorption have a wide-ranging and long-term impact, extending beyond business sites and surrounding areas. However, by measuring emissions and absorption and comparing them, magnitude was determined to be low. Land use has a long-term impact on business sites and surrounding areas. As CENIBRA's forestry business properly manages forests and engages in reforestation and efforts to utilize waste land, the impact of its magnitude was determined to be high, mainly in a positive context. The impact of forestry activities on pollution and water use was determined to be low.

	Low	Medium	High
Spatial extent	Occurs in a small overall area to a specific aspect of biodiversity	Occurs in a moderate overall area to a specific aspect of biodiversity	Occurs in a large overall area to a specific aspect of biodiversity
Duration	Impact is limited, recovers in 1-2 years	Impact continues for 2-10 years	Impact continues for more than 10 years
Magnitude	The magnitude of impact drivers is small compared to biodiversity element sensitivity	The magnitude of impact drivers is moderate compared to biodiversity element sensitivity	The magnitude of impact drivers is large compared to biodiversity element sensitivity

■ Impact Assessment

Impact drivers	Impacts	Metrics	Direction	Value (2023)	Spatial extent	Duration	Magnitude
GHG emissions absorption	The balance between GHG emissions from the use of forestry and other machinery, and the absorption and stock of GHG by trees has an impact on global climate change. If climate change progresses, there is a possibility that the speed of timber production will slow down, restrictions on water intake will be imposed, and the severity of disaster damage will increase.	GHG emissions from the use of forestry and other machinery	-	62,014 tCO ₂ /year	High	High	Low
		GHG absorption by trees	+	1,519,520 tCO ₂ /year			
		Forest carbon sequestration	+	44,913,879 tCO ₂			
Land use	Land use directly impacts biodiversity and various ecosystem services. If deforestation occurs, there is a possibility of soil degradation, changes in water flow, and increasingly severe damage from disasters. On the other hand, proper land management can improve the multifaceted function of forests.	Total area of land under management	- / +	254,010 ha	Medium	High	High
		Forest certification acquisition rate	+	97.56%			
		Conservation forest area within company-owned forests	+	106,505 ha			
		Regeneration and restoration area	+	358.60 ha/year			
Pollution	Excessive use of pesticides and fertilizers can cause eutrophication in soil and rivers, leading to ecosystem degradation. On the other hand, when used in appropriate amounts, they can improve soil health.	Amount of pesticide used	- / +	124.4 t/year	Low	Medium	Low
		Amount of fertilizer used	- / +	38,467 t/year			
Water use	Excessive water intake lowers river levels and leads to aquatic ecosystem degradation. It might also reduce the availability of water in surrounding areas.	Water intake for seedling production, dust suppression, etc.	-	216,410 m ³ /year	Low	Low	Low

2-2-2 Dependencies, Impacts, Risks, and Opportunities

Identifying and Assessing Risks and Opportunities

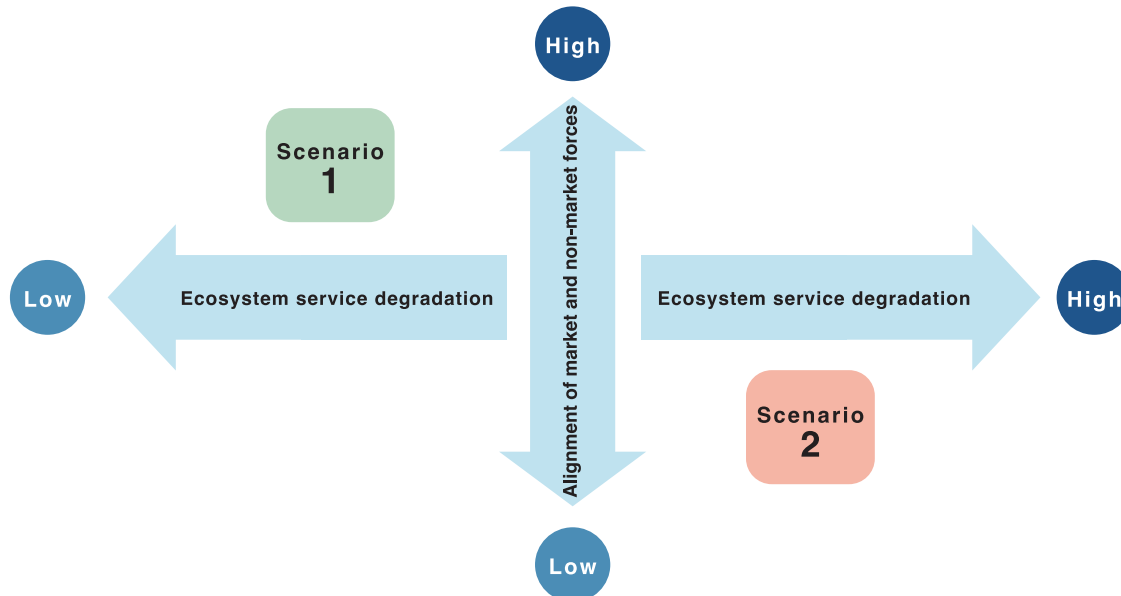
Nature-related risks and opportunities arising from the state of nature and the dependencies and impacts of our business activities on nature have been assessed as follows.

▸ Assessing Risks and Opportunities

CENIBRA promotes activities in response to identified risks and opportunities, and after considering their effectiveness, assesses them on a three-tier scale based on two criteria: magnitude, indicating the financial effects posed by risks and opportunities, and likelihood, indicating the potential for risks to materialize or opportunities to be exploited. The assessment considered short-term (2025), medium-term (2030), and long-term (2050) timeframes.

The assessments for 2030 and 2050 used two exploratory scenarios.

■ TNFD Recommended Uncertainties Matrix



▸ Scenarios

The scenarios used for the 2030 and 2050 assessments were developed with reference to TNFD guidance on scenario analysis, focusing on two major uncertainties closely related to physical and transition risks. In Scenario 1, policies and regulations are strengthened and environmental awareness among investors and consumers increases, resulting in the conservation and restoration of nature worldwide. In Scenario 2, this transition does not occur and natural degradation continues worldwide.

Furthermore, in consideration of the close relationship between natural capital and climate change, we have combined climate change—and nature-related scenarios.

In using these two scenarios, we are preparing for future uncertainties and ensuring we do not overlook any risks or opportunities.

■ Scenarios

▸ Scenario 1

- Policies and regulations to conserve and restore nature are introduced and strengthened.
- The preference for sustainable consumption among investors and consumers rapidly increases.
- Nature is conserved and restored, leading to a transition into a nature-positive society. People will enjoy sustainable benefits through ecosystem services.
- In terms of climate change, GHG emissions are reduced and the 1.5°C warming (RCP1.9) scenario unfolds.

▸ Scenario 2

- No major changes in policies or regulations.
- Low interest in and demand for efforts to conserve and restore nature and nature-based products.
- Nature continues to deteriorate, and the quality of ecosystem services declines.
- In terms of climate change, there is no progress in reducing GHG emissions, and the 4°C warming (RCP8.5) scenario continues unabated.

2-2-2 Dependencies, Impacts, Risks, and Opportunities

► Results

The list of risks and opportunities, and the results of their assessment, are shown in the table on the below. Countermeasures described in the table are explained in detail on page 24 and beyond.

In Scenario 1, transition risks were primarily assessed as high. Specifically, these are expected to involve increasing financial impacts due to strengthened reporting obligations and the introduction of new natural capital-related regulations, as the negative image associated with deforestation continues to expand. However, responding appropriately to reporting obligations, engaging in conservation and restoration activities, and implementing sustainable business activities will boost investor and consumer preferences, and become business opportunities.

In Scenario 2, mainly physical risks were assessed as high. Specifically, this is expected to involve rising temperatures that reduce timber productivity, increase the frequency of fires, and drive costs higher due to soil degradation. Business opportunities primarily involve improving resilience to nature loss, which requires reducing the impacts of resource scarcity through the efficient use of resources.

■ Risk Assessment

Category	Risks	Financial effects	Countermeasures	2025	Scenario 1		Scenario 2	
					2030	2050	2030	2050
Physical	Higher temperatures and increasing number of extremely hot days	Increased costs and decreased sales caused by declining lumber productivity	Climate change mitigation	●	●●	●●	●●	●●●
	Decreased precipitation and longer drought periods	Increased costs and decreased sales caused by declining lumber productivity and operational restrictions due to unstable water supply	Installing reservoirs, subsoiling	●	●	●	●	●
	Increased frequency of flooding	Operational restrictions due to submerged trees and soil runoff	Installing reservoirs, subsoiling	●●●	●●●	●●●	●●●	●●●
	Worsening fire weather and increasing frequency of forest fires	Increased reforestation and fire prevention costs	Climate change mitigation fire prevention	●●●	●●●	●●●	●●●	●●●
	Accidental water pollution caused by external factors such as the collapse of a tailings dam	Operational restrictions due to restrictions on water intake and wastewater	Water quality monitoring	●	●●	●●	●●	●●
	Deterioration of soil quality due to soil compaction caused by forestry machinery and absorption of soil nutrients by planted trees	Increased costs and reduced sales due to declining lumber productivity and increased costs of fertilizer and pesticide use	Appropriate fertilizer selection, subsoiling	●	●	●●	●●	●●●
	Significant loss of biodiversity due to inappropriate land management	Responsibility for the decline in access to ecosystem services due to ecosystem degradation and the loss of biodiversity	Avoiding deforestation, establishing conservation forests, preserving water sources	●	●●	●●	●●●	●●●
Transition	Increasingly stringent reporting requirements for nature-related risks and impacts	Increased monitoring costs and fines for delayed responses	Acquisition of various certifications, compliance with new regulations, development of monitoring technologies	●●	●●●	●●●	●●	●●
	Stricter laws pertaining to rights, permits, and distribution of natural capital	Restrictions on tree felling, water intake, and other operations	Water intake reductions	●	●	●●	●	●
	The spread of negative perceptions regarding tree felling and misunderstandings caused by simple forest assessment tools (confusing permanent deforestation with properly managed forest management areas)	Declining demand due to deteriorating reputation	Disclosure of monitoring with satellite imagery analysis of forest	●●	●●●	●●	●●	●●

• Magnitude

High	●
Medium	●●
Low	●●●

• Likelihood

High	●●●
Medium	●●
Low	●

2-2-2 Dependencies, Impacts, Risks, and Opportunities

Opportunity Assessment

Opportunities	Financial effects	Countermeasures	2025	Scenario 1		Scenario 2	
				2030	2050	2030	2050
Increasing demand for renewable resources, including alternative uses for non-renewable resources, and increasing demand for certified products in line with preference for nature-based products	Increases sales	Developing products, acquiring various certifications, responding to new regulations	●●●●	●●●●	●●●●	●●●●	●●●●
More efficient use of wood and water resources	Reduces costs, improves resilience to resource scarcity, and reduces negative impacts from land and resource use	Developing applications for lumber, recycling resources	●●●●	●●●●	●●●●	●●●●	●●●●
Wasteland utilization	Improves resilience to resource scarcity, avoids negative impacts of land use, improves land health, and improves quality of various ecosystem services	Forest restoration	●●●●	●●●●	●●●●	●●●●	●●●●
Ecosystem preservation and recovery activities	Improves quality and reputation of various ecosystem services	Establishing conservation forests, forest restoration, Establishing ecological corridors, reintroducing endangered species	●●●●	●●●●	●●●●	●●●●	●●●●
Water conservation activities, water quality and provision management	Reduces risk of potential water shortages and improves reputation	Water conservation	●●●●	●●●●	●●●●	●●●●	●●●●
Access to green funds and trading of forest carbon and biodiversity credits	Improves access to capital and funding		●	●●	●●●●	●	●
Enhanced reputation through participation in initiatives, collaboration with stakeholders, and contributions to local communities	Enhances reputation, expands opportunities for collaborations	Promoting social contribution activities, implementing communications activities with local communities	●●	●●●●	●●●●	●●	●●

· Magnitude

High	●
Medium	●
Low	●

· Likelihood

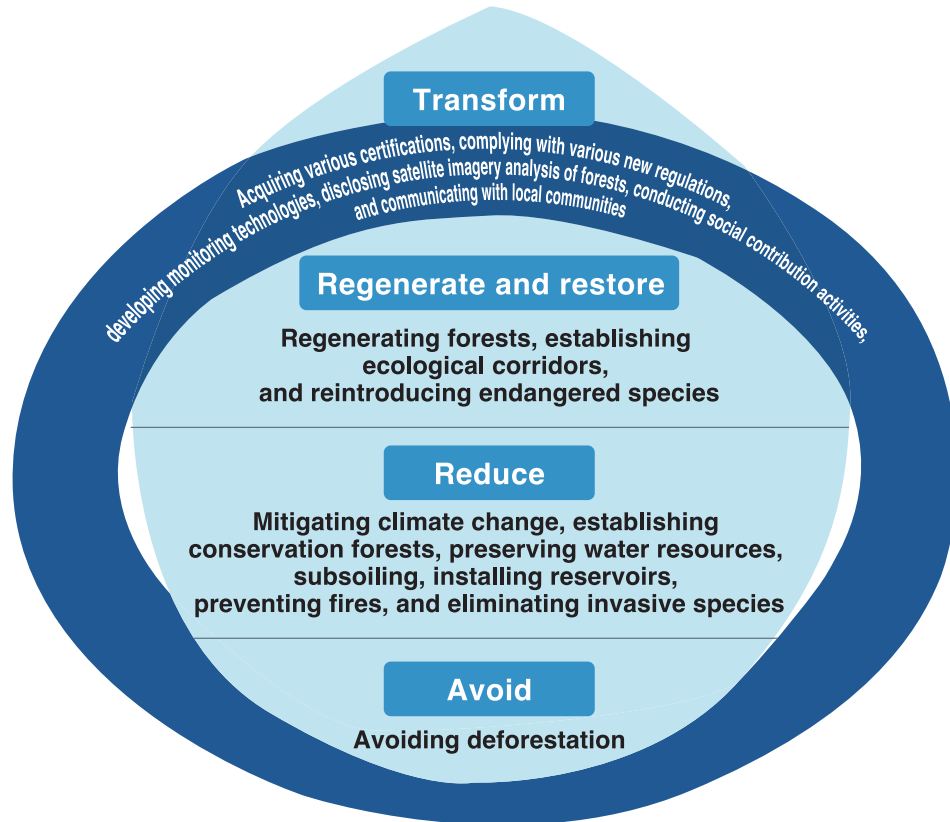
High	●●●●
Medium	●●
Low	●

2-2-3 Response Actions

Response to Risks and Opportunities

In response to identified risks and opportunities, we are implementing actions to “avoid,” “reduce,” “regenerate and restore,” and “transform” based on the principle of mitigation hierarchy, in line with the Action Framework (AR3T) introduced by the Science Based Targets Network (SBTN), an international organization that develops methodologies for science-based targets for nature.

■ Action Framework and Countermeasures



► **Avoid**

• **Avoiding deforestation**

We conduct forest management with the aim of avoiding negative conversions of natural forests and deforestation.

► **Reduce**

• **Climate change mitigation**

We engage in sustainable forest management and efforts to regenerate and restore, maintain, and promote the absorption and stock of carbon from the atmosphere. At CENIBRA, annual GHG absorption exceeds annual emissions.

• **Conservation forest creation and water conservation**

We manage approximately 106,000 hectares of conservation forest and preserve 4,500 springs onsite and 969 springs on adjacent third-party land. We also conduct **mosaic forest management**, which involves a balanced arrangement of production forests and conservation forests, and a mosaic distribution of diverse forest ages and tree species. This minimizes environmental impacts and increases resilience against pests, diseases, and weather hazards, as well as the availability of other ecosystem services.



Mosaic forest physiognomy

2-2-3 Response Actions

► **Reduce**

• **Installation of reservoirs**

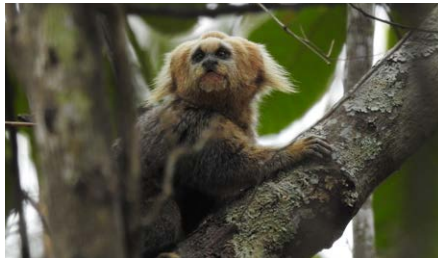
Since launching this initiative in 2018, we have installed 377 reservoirs within CENIBRA's forests as of 2023. These reservoirs provide a stable water supply throughout the year, helping to address declining precipitation in recent years. In addition, water stored during the rainy season slowly percolates underground, boosting the groundwater recharge functions. The locations of these reservoirs were selected so that local residents can also use them, thus ensuring harmony with local communities in the use of water resources.

• **Subsoiling**

We plow the soil as a way of ameliorating soil compaction caused by the use of forestry machinery and other equipment. Plowing encourages the regular infiltration of rainwater into the soil and can improve the growth of plantation trees. We also disseminate technologies that contribute to restoring groundwater recharge functions, reducing soil erosion, and improving water quality.



Subsoiling



Buffy-headed marmoset

• **Preventing fires**

In recent years, large-scale forest fires have rapidly emerged as a global issue. CENIBRA has launched an innovative fire prevention system that utilizes artificial intelligence (AI). In forests, there are 39 observation towers fitted with 360-degree rotating cameras and a monitoring center that operates 24 hours a day. When the AI detects smoke or fire, the fire brigade members closest to the scene are contacted from the monitoring room, and firefighting operations are swiftly implemented. High-performance AI-equipped cameras can pinpoint the exact location of fires within 1–2 minutes, which has been successful in substantially reducing the risk of forest fires.



Fire Monitoring Center

• **Controlling invasive species**

Invasive grass species that affect the growth of eucalyptus seedlings and native species have been identified across the property, and CENIBRA is proactively working to control these species to ensure the sustainability of the forest. Furthermore, the introduction of a non-native marmoset, which competes with the endangered buffy-headed marmoset (*Callithrix flaviceps*), threatens the stability of the native population. There is also the issue of hybridization between native and non-native marmosets. CENIBRA, in partnership with the Center for the Conservation of Marmosets (CCSS) at the Federal University of Viçosa, has undertaken an initiative to capture and sterilize hybrid marmosets.

2-2-3 Response Actions

► Regenerate and Restore

• Forest regeneration

When necessary, we conduct activities to regenerate and restore natural forests, either on natural forests that have been damaged by natural disasters, or on newly acquired land. Restoration activities are conducted on the basis of scientific advice from the university and verified by third-party organizations. As part of restoration efforts, more than 600,000 trees comprising 40 different native tree species have been planted to date.



Reforestation in wastelands

• Establishing ecological corridors

To conserve forest ecosystem biodiversity, we must ensure wildlife migration routes and promote habitat expansion and mutual interactions. CENIBRA is engaged in the Ecological Corridor Project on third-party grazing land that is fragmenting the natural forest. We work with landowners to restore vegetation on degraded land between fragmented natural forests and to prevent livestock from entering by fencing land around water sources..



Creating ecological corridors on third-party land

The restored vegetation will function as a corridor enabling wild animals to move between the natural forests, contributing to the conservation of the ecosystem and biodiversity. We achieved our goal of connecting more than 20,000 hectares of natural forest by 2023.

• Reintroduction of endangered species

The Mutum Project has been running since 1990 at the Macedonia Farm, comprising 560 hectares registered as a Private Reserve Natural Heritage Reserve (RPPN). We have entered into a technical and scientific cooperation agreement with a Brazil-based NGO (CRAX, Wildlife Stewardship and Reproduction Research Society) and are breeding and raising endangered species, including the Mutum (red-billed curassow), with the aim of returning them to the wild. To date, a total of 480 birds comprising seven species have been released, and more than 300 of those released have given birth in the wild.



Mutum live in company-owned forests

2-2-3 Response Actions

► Transform

• Social contribution and communicating with local communities

Established in 2002, the CENIBRA INSTITUTE strives to maintain close relationships with the community, while working to respect culture and the environment, strengthen local economies, and engage in excellent public management. These initiatives involve providing support for agriculture, tree planting, beekeeping, and other activities aimed at maintaining stable farm incomes in areas surrounding tree plantations.



Support for beekeeping

CENIBRA also works with municipalities and local NGOs to provide free lectures and training, textbooks, meals, transportation, and other resources to support young entrepreneurs, while promoting the local procurement of materials and goods to invigorate local economic activity.

• Efforts related to new regulations

CENIBRA has established a working group and is currently considering how to respond to the requirements of the European Union Deforestation Regulation (EUDR), a new regulation that will be applied in the European Union (EU), one of our major markets.

• Development of monitoring technologies

By combining optical remote sensing technologies (LiDAR) with machine learning, we classified the regeneration stages of conservation forests. Utilizing this technology, we were able to identify the existence of rocky outcrops, which are fragile ecosystems that play an important role in protecting the endemic species of the Atlantic Forest.

• Disclosure of monitoring with satellite imagery analysis of forest

In recent years, advancements in satellite data analysis technology have made it easier to monitor forests over wide areas and long periods. However, due to issues with analysis accuracy and the lack of reflection of actual on-site conditions, careful handling of the data is necessary. Oji Holdings commissioned a third party to analyze forest changes by combining satellite data and on-site information for CENIBRA's forests. The results show that most of the areas shown as deforested in the publicly available datasets are not actually deforested, such as plantation areas (Areas properly logged and reforested.) and areas that have already regenerated after a temporary decline due to natural disasters.

• Acquiring various certifications

We are acquiring various certifications, including FSC™ and PEFC certification, to demonstrate our sustainable forest management efforts.

In 2024, CENIBRA became the first company in the forestry sector to obtain LIFE certification. LIFE certification is an international certification that certifies that an organization practices sustainable activity and contributes to the conservation of biodiversity and the maintenance of ecosystem services. To obtain LIFE certification, the Biodiversity Pressure Index (BPI), which shows the scale of pressure on biodiversity from corporate activities; the Biodiversity Minimum Performance (BMP), which is the minimum score required to compensate for the pressure; and the Biodiversity Positive Performance (BPP), which is the score of voluntary actions carried out by the organization for the conservation of biodiversity, are calculated according to the LIFE methodology. In the case of CENIBRA, BPP was about three times higher than BMP, and the third-party audit verified that CENIBRA contributes to the conservation of biodiversity and maintenance of ecosystem services through its corporate activities and biodiversity conservation activities.



LIFE Certification documents

2-2-4 Setting Metrics and Targets

Setting Metrics and Targets

In consideration of risk and opportunity assessment results and significant impacts on society, we have set three nature-related metrics and targets, as shown in the table on the right. After avoiding deforestation, reducing GHG emissions, reducing water intake, and implementing other direct avoidance and reduction measures, we will expand regeneration and restoration activities.

CENIBRA conducts native tree planting and revitalization on land that has been damaged by natural disasters or other causes that is in poor condition, as well as on newly purchased wasteland. We will continue efforts to create ecological corridors (fenced areas to prevent livestock from entering) on third-party land (mainly pasture land) to promote revegetation. The benefits of these activities include the expansion of habitats for native populations, including rare and endangered species, increased diversity, improved soil quality, increased water source cultivation, and climate change mitigation. As a result, this will also enable CENIBRA to more effectively reap the benefits of nature. For example, forests with rich diversity are less susceptible to the spread of pests and diseases, facilitating the reduced use of pesticides. Furthermore, if large-scale flooding occurs on derelict land, soil will be washed into rivers, causing topographical changes and lowering river levels, which in turn reduce water availability. Regenerating forests on derelict land make this type of damage less likely to occur, reducing the risks of water shortages and natural disasters.

These targets were considered and developed in line with the LEAP approach, which we implemented with the assistance of KPMG AZSA LLC. Furthermore, after deliberations at Oji Group Board of Directors meetings, these issues are incorporated into sustainability material KPIs and managed accordingly. The progress of these efforts is disclosed in the TNFD report, which we plan to publish annually going forward.

■ Metrics and Targets

Metrics	Targets
Area of natural forest regenerated on property*1	At least 3,000 ha between 2024 and 2033
Number of native tree species planted on property*2	At least 500,000 seedlings between 2024 and 2033
Area of ecological corridors formed outside owned property*3	At least 3,500 ha between 2024 and 2033

*1 The area where planting and other activities were carried out to restore natural forests lost due to windthrow, fire, etc.

*2 The number of trees planted within the natural forests owned.

*3 The area enclosed by fences to promote the revegetation of degraded lands between fragmented natural forests and to allow wildlife to move freely, in collaboration with landowners.

■ Effects

Impacts on Nature and Society

- Expands habitats
- Increases biodiversity
- Improves soil quality
- Increases water source cultivation
- Mitigates climate change

Impacts on CENIBRA

- Mitigates damage from pests and diseases
- Mitigates water shortage risks
- Mitigates climate change risks
- Mitigates natural disaster risks
- Mitigates reputational risks



Ecotone (transition area) between forest and wetlands seen in the Sarufutsu Forest

2-3 Forestry in Japan

For many years, the Oji Group has been working on forestation in Japan, another of our priority regions. From Hokkaido to Kyushu, we own 188,000 hectares of company forests encompassing approximately 650 locations and engage in sustainable forest management in order to conserve biodiversity, maintain diverse functions of forests such as water source recharge, and enhance and utilize forest resources.

In recent years, companies have also been required to assess and disclose their impact on nature, as well as the dependencies, risks, and opportunities associated with their business activities. As a first step, we plan to disclose information on initiatives that quantify the diverse functions of forests and will further improve their environmental value through natural restoration.

We aim to establish the Oji Model, an evaluation method for measuring the value of natural resources, including biodiversity, CO₂, water, soil, and nutrients, as well as develop natural capital accounting, which converts the value of natural resources into monetary figures and discloses them. We will continue efforts to maximize the value of our forests with the aim of being nature-positive.

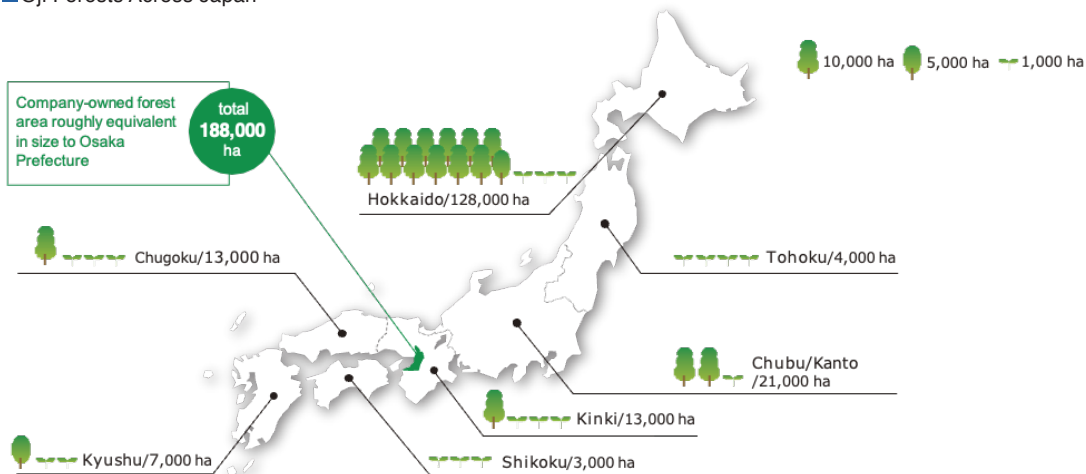
2-3-1 State of Nature

Domestic Forest Management

For many years, the Oji Group has been working on forestation in Japan, and from Hokkaido to Kyushu, we own 188,000 hectares of company forests encompassing approximately 650 locations.

Of this, plantations account for 41%, or 77,000 hectares, comprising mainly Sakhalin fir and Japanese larch trees in Hokkaido, and Japanese cedar and cypress in Honshu and southern Japan. These trees' average stand age is 60 years old, and they have reached the primary age for harvesting. While making use of forest resources (primary harvesting and replanting to rejuvenate the forest), we are also continuously engaged in thinning and other cultivation work to enhance resources for subsequent generations. Forest management divisions in each region promote sustainable forest management in order to conserve biodiversity, maintain diverse functions of forests such as water source recharge, and enhance and utilize forest resources.

■ Oji Forests Across Japan



▶ Renewable Forest Resources

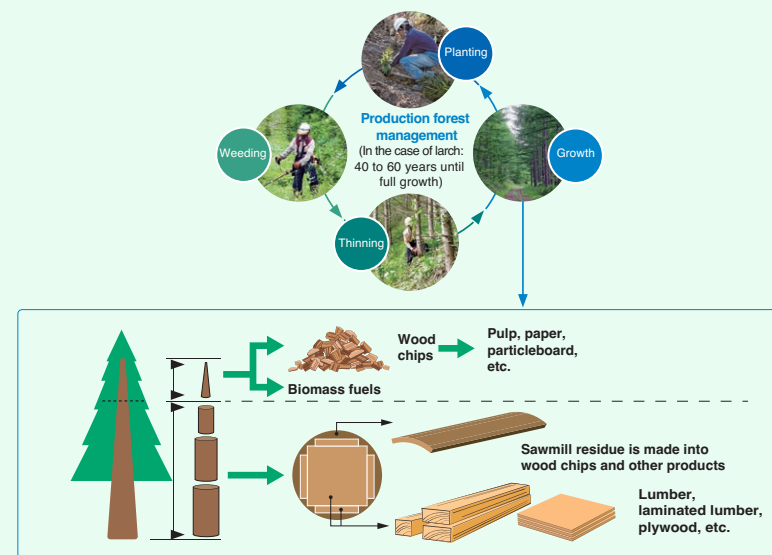
Forests are used as a sustainable resource that can be planted, grown, harvested, and replanted.

The harvested wood can be utilized with zero waste for a variety of purposes, including lumber, plywood, woodchips for paper manufacture, and wood biomass fuel. Through these and other efforts, the Oji Group promotes the sustainable use of wood as a comprehensive forestry industry business group.

▶ Maximizing Performance of the Diverse Functions of Forests

Similar to forest products, we are also taking the lead in maximizing performance of the diverse functions of forests. Of our domestic forests, 12,000 hectares have been designated as conservation forests that are managed appropriately to maximally facilitate the conservation of biodiversity; the cultivation of water sources, which are an important resource for all living things; the use of forests for recreation and landscape maintenance; the prevention of soil runoff and collapse for the purpose of national land conservation; the protection of scientifically valuable forests; and other functions.

■ Forest Resources and Cascading Use



2-3-1 State of Nature

Quantifying Diverse Forest Functions

The Oji Group is committed to taking the lead in maximizing performance of the diverse functions of its vast forests. Furthermore, in recent years, companies have been required to measure and disclose their impact on nature, as well as the dependencies, risks, and opportunities associated with their business activities. In response, the first step is to measure the state of nature in forests and quantify their diverse functions. In our domestic surveys, we are working to quantify two functions in all company-owned forests, biodiversity and water source cultivation.

▶ Assessing Biodiversity importance

The map on the right shows the results of a comprehensive assessment of all company-owned forests. The importance of forest biodiversity increases as the score approaches 1.0 (red).

In calculating scores, we considered overlaps between company-owned forest and key biodiversity areas (KBAs*1), the number of vegetation types obtained from Ministry of the Environment vegetation data, the biota estimated by a species distribution model*2, and the coverage rate of endangered species in each area.

As our business operation in company-owned forests with particularly high scores might significantly depend and impact on nature including surrounding areas, we plan to identify and analyze several of these critical forests going forward.

*1 KBA: An area of key importance for conservation of biodiversity. KBAs are selected worldwide based on the concept of "criticality" (habitat of globally threatened species) and "non-substitutability" (particular location where survival of a species depends).

*2 Species distribution model: A method for estimating the spatial distribution of species using a dataset of environmental factors that influence distribution. The model has a spatial resolution of one kilometer and takes into account various environment factors such as climatic variables, geology, vegetation, land cover, and topography. Environmental suitability, which indicates the suitability of each location for the habitation of a given species, is obtained as a value between 0 and 1. Values of 0.7 or higher were considered to indicate high probability of habitation.

▶ Estimated Species Richness

In the process of creating the aforementioned map, we used a species distribution model to estimate the organisms that inhabit our forests and determined the possibility that there are more than 3,000 species of organisms inhabiting all company-owned forests in total, of which approximately 1,400 are endangered species.

Furthermore, estimates of endangered species included endangered species in Class I and II (groups with the highest risk of extinction) from the Japanese Red List for each prefecture. It is possible that long-term forest cultivation efforts could contribute to maintaining ecosystems in each region.

■ Number of Species Estimated to Live in Company-owned Forests

Taxon	Estimated species richness	Of which, endangered species
Amphibians	51	25
Birds	294	97
Seed plants	2,667	1,273
Total	3,012	1,395

■ Importance of Biodiversity in Company-owned Forests



Earthstar Geographics | Esri, TomTom, Garmin, FAO, NOAA, USGS

2-3-1 State of Nature

▶ Economic Value Assessment of Oji Forests

The economic value of forest functions was estimated using Forestry Agency evaluation and other methods*1 and as shown in the table on the right, the annual economic impact was approximately 550 billion yen.

The largest portion, approximately 212 billion yen of this amount, was for the soil runoff prevention function of forest understory vegetation and fallen leaves and branches, which prevents surface erosion.

▶ Water Resource Cultivation Assessment

The water resource cultivation function*2 was calculated using the National Land Information Platform, and the daily cultivation volume (amount of water seeping down from the ground surface) was calculated to be approximately 5.1 million cubic meters per day. This is equivalent to the amount of water used by approximately 16.9 million people per day*3.

Further, using costs required to construct irrigation dams, flood-control dams, and other facilities, the economic value came out to approximately 204 billion yen per year.

These results suggest that Oji forests both prevent soil erosion caused by rain and store water and slowly supply clean water, thereby bringing about significant economic benefits.

■ Oji Forests (Domestic Forest) Economic Value Assessment

Public benefit functions of forests	Value (billion yen/year)	Function details
Water resource cultivation function	204	The soil in forests stores rainfall, equalizes the amount of water flowing into rivers, prevents floods and droughts, and through this process, purifies water quality.
Soil erosion prevention function	212	The understory vegetation and fallen leaves and branches in forests play a role in controlling soil erosion.
Land slide prevention function	63	Forests prevent landslides due to their expansive root systems.
Health and rest functions	17	The role that forests play in providing people with relaxation and leisure time.
Wildlife conservation function (biodiversity conservation)	43	The role of forests as habitats for wild birds and animals.
Air quality conservation function (CO ₂ absorption)	11	The role of forests in absorbing CO ₂ and emitting oxygen during the course of their growth. (The amount of CO ₂ absorbed is calculated by replacing it with the price of purchasing carbon credits.)
Total	550	



*1 Calculation based on the methodology used in the Forestry Agency of Japan's 2000 Valuation of the Public Benefit Functions of Forests (calculated by multiplying the Forestry Agency's estimated national valuation by the ratio of Oji Holdings' forest area to the national forest area). The calculation unit and evaluation method were updated where possible (water resource cultivation, biodiversity conservation, air quality conservation).

*2 In forests, fallen leaves and other organic matter are decomposed by earthworms and microorganisms to form humus. The humus forms a sponge-like structure that stores water and allows clean water to slowly flow out.

*3 Calculated as 300 L of water used per person per day in each household.

2-3-2 Initiatives Focused on Nature

Various Conservation Activities

Focused on nature-positive outcomes, the Oji Group practices sustainable forest management in consideration of the environment and regional communities.

We also collaborate with governments, environmental NPOs, academic researchers, and community residents to protect and cultivate rare plants and animals, and maintain and recover ecosystems.

▶ Participation in the 30by30 Alliance

30by30 is a global target for the conservation of at least 30% of land and sea as healthy ecosystems by 2030. To this end, the Ministry of the Environment, together with a voluntary coalition of companies, local governments, and other organizations, launched the “30by30 Alliance”^{*1} in April 2022. Oji has participated since the launch of the Alliance and made efforts to register domestic company-owned forests with the Nationally Certified Sustainably Managed Natural Site^{*2}.

^{*1} The Alliance supports member registration of owned or managed land under Other Effective area-based Conservation Measures (OECM) and expansion of protected areas. OECM are areas where biodiversity is being conserved through private-sector efforts, including company-owned forests and *satoyama*.

^{*2} Certification of areas where biodiversity is being conserved through efforts by the private sector or other parties. Certified areas are registered as OECM in a global database, excluding any overlap with protected areas.

▶ Fairy Pitta Conservation and OECM Registration (Koyagauchi Forest, Kochi Prefecture)

The Oji Group has been working with the Ecosystem Trust Society since August 2016 to protect fairy pitta habitats in the Koyagauchi Forest, located in Kochi Prefecture. The Koyagauchi Forest was certified as a Nationally Certified Sustainably Managed Natural Site by the Ministry of the Environment in 2023 and registered on the World Database on OECMs in August 2024.

The fairy pitta is a migratory bird about 20 centimeters in length that arrives in Kyushu and Shikoku from spring to early summer to breed, then is said to migrate to Thailand or Borneo in the autumn to overwinter. As the detailed ecology of the species is unknown, it is designated as a Class IB endangered species on the Ministry of the Environment’s Red List.

▶ Sarufutsu Itou Conservation and Protection Activities (Sarufutsu Forest, Hokkaido)

In 2009, the Oji Group established the “Sarufutsu Itou Conservation Council” in collaboration with a local NPO, government agencies, and researchers for the purpose of protecting the endangered “Itou,” a salmonoid species that inhabits rivers in the Sarufutsu company-owned forest in Hokkaido. A total of 2,600 hectares of forest including river areas was designated a conservation area. Council activities include the removal of man-made objects that prevent the itou from migrating upstream, and surveys on spawning beds and the number of individuals migrating upriver.

▶ Alpine Plant Community Restoration Activities (Samani Forest, Hokkaido)

The alpine plant community on Mt. Apoi is home to many endemic plants with place names such as “Apoi,” “Samani,” and “Hidaka,” and was designated a national special natural monument in 1952. While the local government and residents continue working together to maintain trails to prevent trampling, patrol the area to prevent illegal digging, and conduct restoration experiments, the Oji Group provides support, such as offering a site for restoring alpine plants, free of charge.



Fairy pitta in the Koyagauchi company-owned forest. Listed as an Endangered IB on the Ministry of the Environment Red List. Photo provided by the Ecosystem Trust Society



Nuptial-colored Itou (male). Listed as an Endangered IB on the Ministry of the Environment Red List. Photo by Yo Chirai



Samani yukiwari blooming on a mountain trail



Apoi-azumagiku blooming in a test site

2-3-3 Future Initiatives

Aiming to Maximize the Value of Forests

Having started with the Sarufutsu Forest in Hokkaido, which scored very high in a survey of company-owned forest biodiversity and water source cultivation, we plan to proceed with the selection of several important forests in and south of Honshu, where we will utilize the latest start-up technologies and partnerships with academia to quantify the diverse functions of forests.

We will quantitatively assess the value of company-owned forest biodiversity and the natural environment that supports it (CO₂, nutrients, soil, water), and proactively implement and disclose initiatives aimed at increasing this value through nature restoration.



Sarufutsu Forest Mokeuni Wetland and Sea of Okhotsk

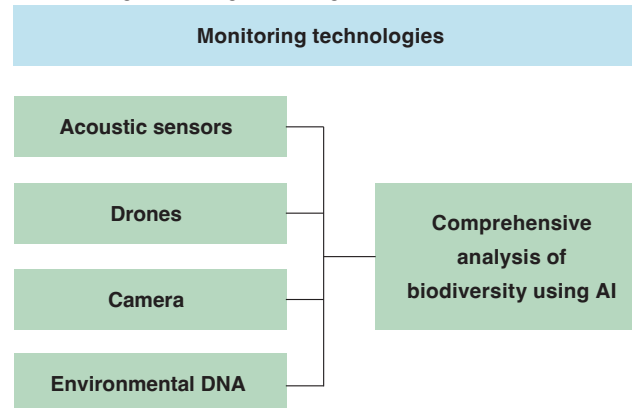
▶ Sarufutsu Forest Field Survey

In conducting field surveys, we collaborate with a start-up from UK where advanced legislation including biodiversity credits can be seen, actively developing technologies for visualizing biodiversity to combine multiple state-of-the-art field monitoring technologies, including drones, cameras, and acousticsensors, AI analysis, and environmental DNA, in an attempt to measure the diversity of various types of plants and animals using a comprehensive and globally applicable approach.

▶ Balancing Forestry Activities in the Sarufutsu Forest with the Conservation of Biodiversity

Sarufutsu is located in a northern wetland area comprising a mixture of woodland, marshes, and streams. The woodland tree species composition is diverse, with natural forest covering 87% of the area, including coniferous species such as Sakhalin spruce, Todo fir, and broad-leaved species such as oak, some of which are more than 100 years old.

■ Combining Monitoring Technologies



In addition to being a valuable habitat for living creatures, wetlands are thought to supply nutrients to coastal ecosystems and store large amounts of carbon in the peat soil below ground. For many years, the Oji Group has been working at this site to balance forestry activities with the conservation of biodiversity, including the rare species of itou that live in the forest's rivers. For example, when felling trees as part of our forestry activities, we take particular care to avoid logging on steep areas to prevent soil runoff, and do not log within a certain distance of streams to protect the spawning beds of the rare itou that inhabits the Sarufutsu River.

In this way, through forest management centered on appropriate thinning, we aim to maintain rich diversity in the Sarufutsu Forest over the next 100 years.



Field Survey with Start-up

2-3-3 Future Initiatives

► Partnership with Hokkaido University

The Sarufutsu Forest has a diverse environment that includes woodlands, wetlands, and streams. These elements are assumed to provide a variety of natural value, but until now, the extent of this value has been unknown.

As part of its nature-positive activities, the Oji Group has launched efforts to quantitatively evaluate and further enhance the value of five key environmental elements (CO₂, biodiversity, nutrition, soil, and water).

Specifically, we have commenced research on themes listed in the table below, and for each theme we have a system in place to procure evidence, with support from Hokkaido University experts, including advice and on-site surveys.

Through this initiative, the Oji Group will consider not only timber production, which has been its traditional focus, but also how to maximize the value of forests by achieving a balance between the various functions that can be derived from forest management.

► Selecting Important Forests in and South of Honshu, and Assessing Biodiversity

We plan to select important forests in and south of Honshu and conduct assessments based on data from field surveys similar to those conducted at the Sarufutsu Forest.

► Future Initiatives

In recent years, companies have been required to assess and disclose their impact on nature, as well as the dependencies, risks, and opportunities associated with their business activities.

However, regarding methods for evaluation and visualization of nature, standards have yet to be established, even in academia.

As a first step, the Oji Group will move forward with state of nature evaluations, and in the future, we seek to develop an Oji model for biodiversity assessments linked to natural capital accounting, involving the conversion of natural value into a monetary sum.

Through these efforts, we will consider ways to reflect regional characteristics, improve accuracy, and add value from new perspectives to the calculated economic value of Oji forests, which we made on rough estimate basis using Forestry Agency methodologies this time.

We will maintain efforts to maximize the value of our forests with the aim of becoming a nature-positive company.

■ Survey Themes for Evaluating the Various Functions of the Sarufutsu Forest

	Category		Theme	Initiative
	Nature restoration	Value assessment		
All regions		○	Biodiversity assessment	Biodiversity assessments utilizing drones, cameras, acoustic sensors, environmental DNA, and other cutting-edge technologies
Rivers in forests	○		Re-meandering forest rivers	Re-meander small rivers that were straightened due to the construction of forest roads, altering organism habitats
			River structure improvements (e.g., culverts)	Increase connectivity by improving river structures that fragment habitats
		○	Biodiversity assessment (aquatic life)	Assess diversity before and after the above-mentioned nature restoration efforts
Marshes	○		Degraded marsh restoration	Ascertain current marsh conditions, which are degraded due to factors such as the encroachment of bamboo and stamping by deer, and conduct restoration efforts
			Biodiversity assessment (plants)	Assess diversity before and after the above-mentioned nature restoration efforts
			Iron supply function assessment	Assess using actual measured values in marshes, rivers, and oceans
Swamp forests, marshes		○	Swamp forests and marsh soil carbon assessment	Assess Sakhalin spruce swamp forest and marsh soil carbon content using actual measured values



Itaigawa Forest, Shimane Prefecture

2-4 Manufacturing Operations in Water Risk Areas

We conducted water risk fact-finding surveys at 21 business sites identified as being located in areas with high water risks based on a water risk survey using publicly available datasets. The results of the 2024 survey revealed no issues in production or operations at any of our business sites, and no actual risks were identified. We also quantified water dependency and impact drivers based on water intake and consumption, and estimated financial effects in the event risks were to materialize. As a result, risks to the Oji Group were judged as being low. However, we continue to implement initiatives aimed at reducing impacts and risks going forward. We also conduct water risk surveys annually in an effort to ascertain actual conditions.

On the other hand, the Oji Group has a major global opportunity to contribute to biodiversity and further improve the sustainability of our business through the water resource cultivation function provided by its vast company-owned forests. (For more information, see page 32.)

2-4-1 Water Resource Conditions

Business Sites in Water Risk Areas

Surveys using AQUEDUCT resulted in the identification of 21 business sites located in areas with high water risk in Italy, China, Thailand, India, Germany, Indonesia, and Australia. These business sites were mainly engaged in the manufacture of packaging and functional materials, and printing and processing. The production amount of these business sites was 312,000 tons and sales were 71.6 billion yen, accounting for approximately 2% of production and 4% of sales for the Oji Group overall.

Water Risk Fact-finding Survey

To understand the actual conditions at business sites evaluated as high risk, we conduct annual interviews to ascertain the impact of water shortages and flooding on operations, the frequency of their occurrence, and the countermeasures implemented. Interviews in 2024 revealed no issues with production or operations at any business site, and no potential risks were identified. We also confirmed that each site is implementing water risk mitigation measures.

2-4-2 Dependencies, Impacts, Risks, and Opportunities

Identifying and Evaluating Dependence and Impact

We used water intake and water consumption as metrics of dependence on water and water use (impact drivers). In water risk areas, water intake was 1,471,000 cubic meters, and water consumed was 354,000 cubic meters, representing less than 1% and 2%, respectively, of the Group overall. We found that water intake and consumption were relatively low compared to production and sales, and these sites have low dependency and low impact on water within the Oji Group.

Identifying and Assessing Risks and Opportunities

Although no immediately apparent risks were identified, it is important to understand and respond to medium- to long-term risks and opportunities in these areas. One potential risk is the suspension of operations due to a serious water shortage. However, the financial effects would be low in a worst-case scenario where all relevant sites were forced to suspend operations, as the sales of these sites account for 4% of the Group. Consequently, the risk has been assessed as low.

Opportunities include mitigation measures such as reducing water intake and consumption, improving resilience through the use of rainwater, working with stakeholders to develop water intake reduction plans, and implementing water source conservation activities.

2-4-3 Response Actions

Water-related Initiatives

In addition to the ongoing implementation of water risk mitigation measures at each business site, we will continue to conduct annual interview surveys. Furthermore, we formulated the “[Environmental Action Program 2030](#)” targeting a water intake intensity reduction of at least 6% compared with fiscal 2018 by 2030 across the entire Oji Group.

The following mitigation measures are currently being implemented at the relevant locations.

- Participating in water resource conservation activities led by public institutions
- Working with industrial water suppliers to formulate water usage reduction plans
- Monitoring water consumption and conducting activities to raise awareness about reducing water consumption and water pollution
- Utilizing rainwater and Group-owned well water
- Providing data to municipal governments and national government agencies on water consumption, wastewater volume, and water quality management
- Expanding the installation of drainage weir boards

Water Risk Survey Results*1

	2023										
	Business sites*2	Water intake (thousands of m ³)		Water consumption (thousands of m ³)*3		Production volume (thousands of tons)		Sales (billions of yen)		Assets (billions of yen)	
Low (<10%) or no data	70	342,312	49%	7,908	35%	6,594	44%				
Low to medium (10%–20%)	122	215,140	31%	4,529	20%	4,484	30%				
Medium to high (20%–40%)	95	135,898	20%	9,754	43%	3,607	24%				
High (40%–80%)	4	1,254	0%	266	1%	103	1%	71.6*4	4%*4	90.8*4	4%*4
Extremely high (>80%)	17	217	0%	88	0%	209	1%				
Total	308	694,820	100%	22,545	100%	14,998	100%	1,696.3*5	100%	2,442.5*5	100%

*1 WRI's water risk assessment tool AQUEDUCT (4.0) Water Risk Atlas - Baseline Water Stress 5-level evaluation: Indicates the degree of potential competition with other users of water, with higher values indicating more intense competition and higher risk → <https://www.wri.org/aqueduct>

*2 Excludes Main Offices, sales offices, and other business sites not involved in product manufacturing.

*3 Water consumption is calculated by subtracting the amount of water discharged from the amount of water intake.

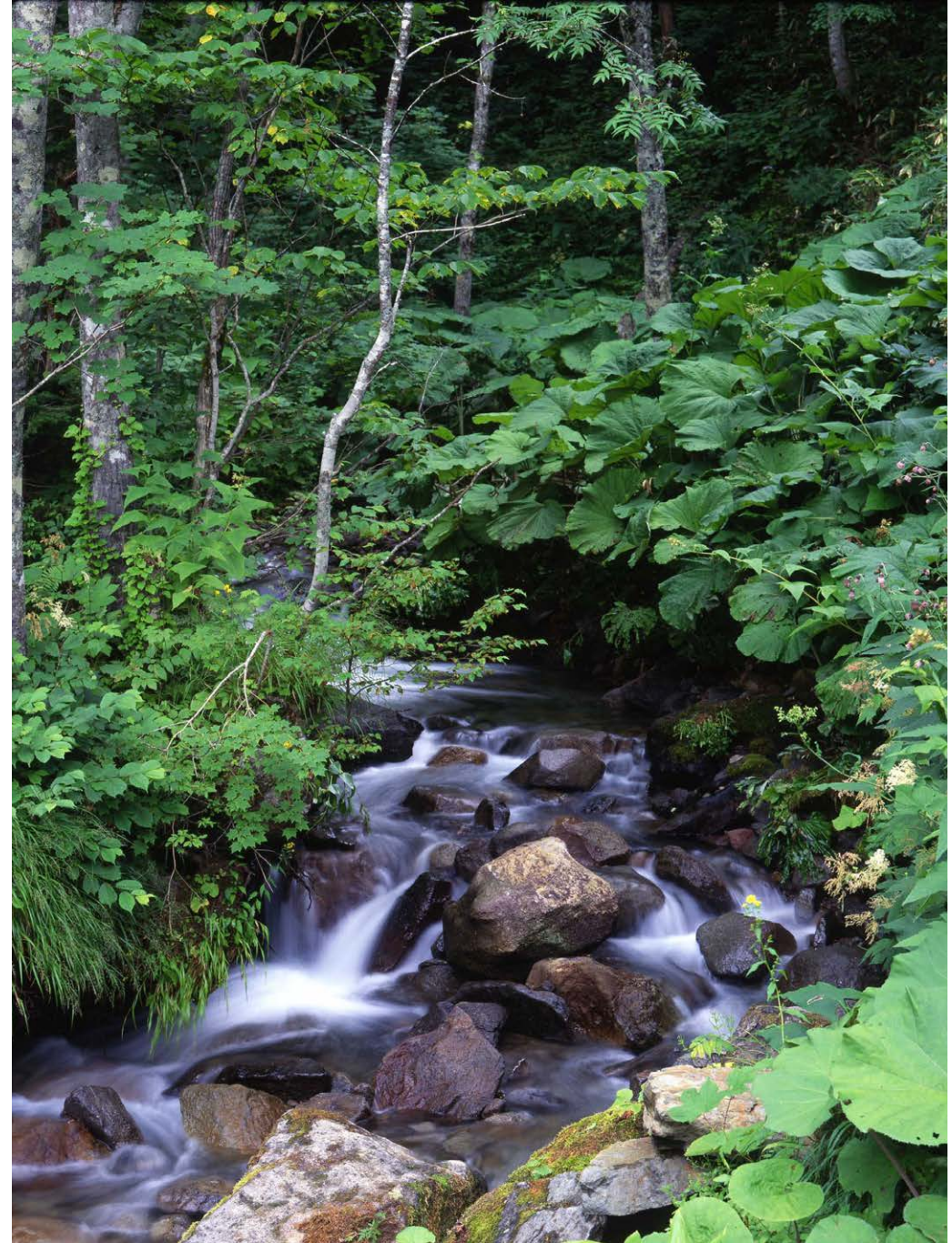
*4 Subtotal of sales and assets of companies that have business sites located in areas with high water risk (High and Extremely high), and the ratio to sales and assets of the entire Group.

*5 Total sales of 1,696.3 billion yen and total assets of 2,442.5 billion yen are for the entire Group.

The Oji Group is aware of its responsibilities as a business that utilizes forests and has been working to create healthy forests for many years. Activities that improve forest health and biodiversity both improve the sustainability of Oji Group business activities, which depend on nature, and protect the lives and health of local communities and contribute to a nature-positive world.

This report discloses information on the Oji Group's nature-related issues and initiatives in line with the TNFD recommendations. With regard to forestry activities conducted by CENIBRA in particular, which owns and manages the Group's largest forests, we identified and assessed nature-related dependencies, impacts, risks, and opportunities; and set measurable targets for forest restoration, native tree species planting, and the establishment of ecological corridors. We plan to report on the progress of these targets once a year. Regarding forests in Japan, we have launched a new initiative to evaluate the state of nature with the aim of further contributing to nature positivity, maximizing forest value, and responding to the need for nature-related disclosures. We plan to establish the "Oji Model," an assessment method for measuring the value of natural resources and link it to natural capital accounting, which discloses the value of nature in monetary terms. We conducted a survey of water risks at manufacturing sites located in areas determined to have high water risk and confirmed that no risks had materialized. We will continue to reduce water consumption, engage in water resource conservation activities and conduct a survey of conditions annually going forward.

We aim to publish the TNFD Report on an annual basis. In fiscal 2025, we plan to disclose a progress report on CENIBRA forestry targets, the progress of forest activities in Japan, and updated information on water risk survey results. In the future, we will also consider expanding the scope of disclosure and integrating that with the TCFD recommendations.



Niseko Forest in Hokkaido

Appendix

Oji Group Dependencies and Impacts

Driver of nature change	Indicator	Metrics	FY2023 results
Climate change	GHG emissions	Scope 1	5,883 kt-CO _{2e}
		Scope 2	959 kt-CO _{2e}
		Scope 3	5,346 kt-CO _{2e}
Land/freshwater/ocean-use change	Total spatial footprint	Total area of company-owned forests	600,043 ha
		Forest certification acquisition rate of company-owned forests* ¹	98%
		Proportion of company-owned forests that is designated for conservation/restoration forest areas	25%
Pollution/pollution removal	Pollutants released to soil split by type	Amount of pesticides from forestry operations	173 t
		Amount of pesticides classified as highly hazardous by the FAO and WHO	0.04 t
		Amount of nitrogen fertilizer used	246 t
		Amount of phosphorus fertilizer used	548 t
Pollution/pollution removal	Wastewater discharged	Amount of total water discharged	672,275 kilo-m ³
		Discharged to rivers, lakes, and marshes	244,025 kilo-m ³
		Discharged into oceans	319,470 kilo-m ³
		Discharged into groundwater	21 kilo-m ³
		Discharged into the sewer	108,759 kilo-m ³
		AOX* ²	0.07 kg/t-pulp
		Nitrogen (only regulated work sites)	1,169 t
		Phosphorus (only regulated work sites)	242 t
		COD (only regulated work sites)	34,519 t
Suspended solid (only regulated work sites)	12,654 t		

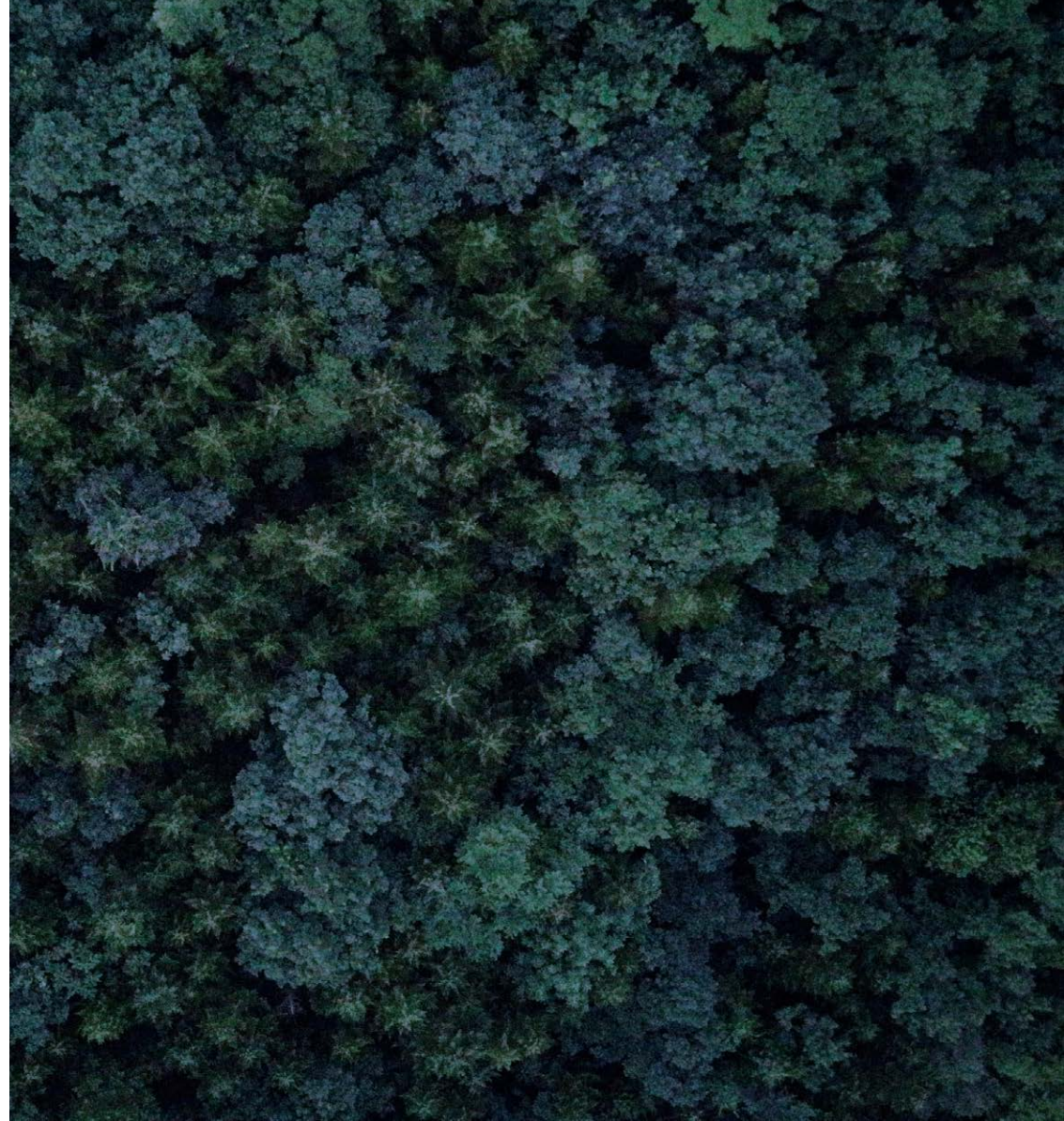
*1 Overseas: Area ratio in company-owned production forests. Japan: Area ratio in company-owned forests excluding shared forests.

*2 Jiangsu Oji Paper, Oji Fibre Solutions, and CENIBRA only.

Driver of nature change	Indicator	Metrics	FY2023 results
Pollution/pollution removal	Waste generation and disposal	Non-hazardous waste generated	2,849,895 t
		Incinerated (regardless of energy recovery)	1,271,574 t
		Landfilled	173,703 t
		Other waste disposal	6,581 t
		Recycled	1,582,511 t
		Hazardous waste generated	167,036 t
		Incinerated (regardless of energy recovery)	102,306 t
		Landfilled	67,231 t
		Other waste disposal	129 t
Recycled	2,808 t		
Pollution/pollution removal	Plastic pollution	Total plastic used or sold (packaging materials only)	30,433 t
Pollution/pollution removal	Non-GHG air pollutants	Soot and dust (only regulated work sites)	2,959 t
		NOx (only regulated work sites)	12,291 t
		VOC (work sites affected by the PRTR law)	159 t
		SOx (only regulated work sites)	5,052 t
		Mercury* ³	0.03 t
Resource use and replenishment	Water intake from high water risk areas* ⁴	Water intake and consumption from high water risk areas	1,471 kilo-m ³
		Water intake from water supply and industrial water	255 kilo-m ³
		Water intake from rivers	1,053 kilo-m ³
		Other	167 kilo-m ³
		Water consumption from high water risk areas	354 kilo-m ³
Resource use and replenishment	Quantity of high-risk natural commodities sourced from land/ocean/freshwater	Wood chip procurement	4,453 kilo-BDT
		Market pulp procurement	146 kilo-ADT
		FSC™ certified materials, recycled materials or other controlled materials that meet FSC™ requirements	100%
		Traceability implementation	100%

*3 Oji Paper, Oji Materia, and Oji F-Tex only.

*4 Areas with Extremely High and High Baseline Water Stress in the AQUEDUCT (4.0) Water Risk Atlas.



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