

Nature Positive Initiative State of Nature Metrics: Terrestrial Pilot Case Study – Oji Holdings

Oji Holdings Corporation is a Japanese multinational focused on sustainable forest resources. It manufactures a diverse range of wood-derived products including pulp, paper, packaging, and advanced functional materials. As part of its activities, Oji Holdings owns approximately 640,000 hectares of forests globally. The group took part in the State of Nature (SoN) metrics piloting programme as part of its broader efforts to assess the value of its forests and the ecosystem services they produce, recognising that credible valuation depends on robust measurement of nature’s condition

A) Where Oji Holdings applied the metrics

Location	Northern Hokkaido, Japan
Pilot site	Sarufutsu Forest
Pilot area size	1,244 hectares
Ecosystems covered	Sarufutsu Forest is one of the most biodiversity-significant forests within Oji Holdings’ domestic forest estate. The study area includes natural forests, plantation forests, wetlands and rivers that provide habitat for the critically endangered Sakhalin taimen (Parahucho perryi).
Metrics piloted & granularity	- Ecosystem extent, site condition, condition of semi-natural habitat and species population abundance were piloted at high granularity level - Proportion of natural or semi-natural habitat, landscape condition and species extinction risk were piloted at medium granularity level
Piloting partner(s)	TNFD

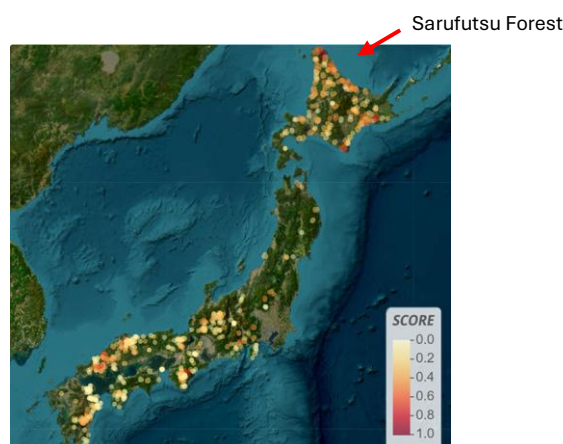


Figure 1: Biodiversity assessment of the approximately 650 Oji-owned forests in Japan conducted by Oji Holdings
Source: Oji Holdings

B) How and why the piloting project was completed

In 2024, Oji Holdings launched a “Forest Value Visualization Project” in the Sarufutsu Forest in Hokkaido, Japan, together with six researchers from Hokkaido University and a nature tech partner, to establish practical approaches for quantifying natural capital and assessing value creation through conservation and restoration activities.

At the same time, Oji has been actively exploring Natural Capital Accounting and the emerging concept of “Nature on the Balance Sheet”, which seeks to connect the value of natural capital with economic and financial decision-making. Oji considers credible valuation as possible *only* if



Figure 2: Ecotone (boundary) between Forest and Wetland observed in the Sarufutsu Forest
Source: Oji Holdings



the underlying condition of nature can first be measured in a scientifically robust way, hence its piloting of the State of Nature (SoN) Metrics.

Oji mainly used biodiversity and environmental datasets collected during 2024-25, through acoustic sensors, camera traps, environmental DNA (eDNA), drones and cameras. This data was processed with artificial intelligence and integrated with satellite imagery and GIS-based analysis. The project was undertaken with technical support, including from taxonomic experts.

C) Key measurement approaches and tools used

	<i>Ecosystem (condition and extent)</i>	<i>Species</i>
<i>Approaches</i>	- <i>Ecosystem extent</i>: created detailed ecosystem maps based on high-resolution satellite imagery and existing land cover, habitat, or forestry maps (GET Level 6 equivalent) and verified with ground visits - <i>Site condition</i>: measured through comparison of observed species composition, functional diversity, and habitat structure against expert-defined reference states, expressed on a standardised 0–1 scale reflecting alignment with expected ecological conditions - <i>Landscape condition</i>: applied the CPLAND index (Core Area Percentage of Landscape) to measure habitat fragmentation	- <i>Species Extinction Risk</i>: Estimated START - <i>Species Population Abundance</i>: tracked relative abundance of selected priority species over time using site-level field observations, with changes indicating trends in species of ecological importance within the site. Monitored taxa included birds, amphibians, mammals (including bats), vascular plants, trees and fish.
<i>Tools / data sources</i>	- <i>Ecosystem extent & landscape condition</i>: ecosystem map verified with ground data and Dynamic World land cover dataset - <i>Site condition</i>: ground-level species data, expert-derived lists of key indicator species, GBIF, Red List, Avonet, Planet (biomass dataset), fractional vegetation cover data (derived from ESA Sentinel 10m data)	- <i>Species Extinction Risk</i>: IBAT; - <i>Species Population Abundance</i>: primary, ground-level species data collected in 2024 and 2025, including passive acoustic monitoring, ground-level super-high-resolution photography, camera traps, drone imagery

D) Key challenges encountered and how the framework was adjusted to ensure practicality



► *Baseline and reference sites in dynamic ecosystems*: plantation forests are dynamic ecosystems that change throughout the forest rotation cycle and support different biodiversity values over time.



► *Buffer-zone assessments*: because neighboring land is often owned by third parties, obtaining field-based biodiversity data of similar quality was not feasible. Consequently, Oji Holdings had to rely more on regional

NPI notes: How feedback was incorporated

► Additional indicators are provided in the guidance to support with measuring shifting mosaic habitats and ensuring the biodiversity value is maintained over time at the landscape-scale.

► Further guidance was provided on the use of remote-sensing data for ground-truthing regional datasets. Additional guidance was developed for defining appropriate buffer zones and ground-truthing is now only





datasets and modelled information than on direct observations.

- **Scalability:** Oji considers that while detailed biodiversity assessments are valuable, applying the same approach across hundreds of thousands of hectares of managed forests would be difficult for many companies from a resource perspective.

required across landscapes at the high granularity level.

- The measurement guidance refers to credible existing frameworks (e.g. TNFD) for how companies can prioritise their measurement efforts. Three different granularity levels of metrics were maintained to enable companies to select the most appropriate for their use case (whilst being transparent on the rationale). Different levels can be used for different locations within a portfolio, and levels can be increased over time with reporting maturity and growing data/tools.

E) Why is it important for companies to measure state of nature metrics?

Oji Holdings considers the SoN Metrics to be a key global effort to establish a common language for measuring nature across sectors and geographies. They are expected to play an important role in the development and application of Natural Capital Accounting systems.

Recognising and rewarding investments in conservation, restoration, and sustainable land management requires credible measurement of changes in the state of nature. In this context, SoN metrics provide essential measurement infrastructure, linking ecological outcomes to economic value.

By enabling more robust and consistent quantification within Natural Capital Accounting systems, Oji highlighted that SoN metrics can support the integration of natural capital considerations into corporate decision-making, disclosure practices, and, ultimately, financial systems.



“If you want to see the value from something, you need to measure it. At Oji we are aiming to use the State of Nature Metrics to help quantify the value of nature and connect this to society.”

Yuya Toyoshima
Manager, Oji Forest Value-Creation & Promotion Dept., Oji Holdings



Learn more about the State of Nature Metrics: naturepositive.org/metrics

