Nature Positive Initiative State of Nature Metrics: Terrestrial Pilot Case Study - LanzaJet

LanzaJet is a US-based sustainable aviation fuel (SAF) producer, with an expanding global pipeline of projects, leveraging the organisation's Ethanol-to-Jet technology. Their product is fully compatible with existing commercial aircraft and airport re-fuelling infrastructure. They are considered as a key player within the airline industry's net zero transition. LanzaJet applied state of nature metrics to explore how they could provide a science-based, standardized way to measure ecological integrity and impact across different sites and feedstock landscapes.

A) Where LanzaJet applied the metrics

Location	Sarawak (Malaysia) and Northwest Borneo
Pilot site	Four RAW Biofuels feedstock sites, a prospective feedstock (Hybrid Tropical Switchgrass) supplier for LanzaJet's fuel production
Pilot area size	3,000 hectares
Ecosystems covered	Degraded grasslands, former plantation areas, and secondary forests
Metrics piloted & granularity	- Ecosystem extent, natural-habitat proportion and habitat connectivity were completed at medium granularity level - Site and landscape condition, and species-extinction risk were completed at low granularity level
Piloting partner(s)	Global Reporting Initiative (GRI)

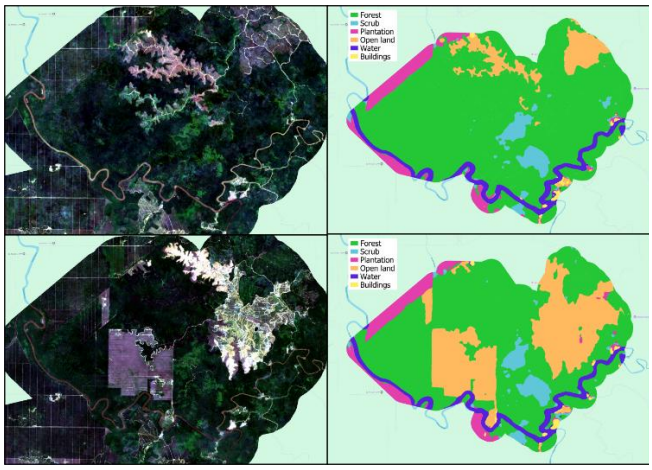

Figure 1: Landcover classification of one of the sample sites for 2020 (top) and 2025 (bottom) (Credit: RAW Biofuels)

B) How and why the piloting project was completed

By piloting the state of nature metrics, LanzaJet aimed to (i) test how data could inform responsible land selection and use for SAF feedstock production, (ii) guide nature-positive investment decisions by demonstrating natural capital appreciation, and (iii) create a transparent, evidence-based baseline for impact reporting. For the sample sites especially, LanzaJet sought to identify low-risk, high

Figure 2: Pig-tailed macaques captured by one of the cameras at the Project Area. (Credit: RAW Biofuels)

restoration potential land for Hybrid Tropical Switchgrass cultivation - avoiding high-value ecosystems, restoring degraded soils, and quantifying the biodiversity co-benefits from such regenerative energy production.

LanzaJet relied on a data-driven and field-validated approach to assess the condition of nature across their sites. The pilot was co-led by RAW Biofuels (a potential supplier), Gentian (a biodiversity intelligence platform), and LanzaJet, with technical support from GRI. Indigenous cooperatives played a central role, providing local ecological knowledge and access for ground-truthing. Additional input came from biodiversity specialists and remote sensing scientists.

Regarding species, field diversity data (species richness, canopy height, and vegetation density) were used to validate condition categories, and confirm that no Critical Habitats were present that would trigger a Critical Habitat Assessment (CHA) under the International Finance Corporation (IFC) Performance Standard 6 (PS6).

C) Key measurement approaches and tools used

	Ecosystem (extent and condition)	*Species*
Approaches	- Used satellite and aerial imagery to develop an AI model of the ecosystem types present, which was trained using ground mapping data collected between 2024 and 2025; - Followed the High Carbon Stock Approach for forest classification, equivalent to GET Levels 4-5; - The model was verified by cross-referencing against on-the ground biodiversity baseline survey data; - Field diversity data on species richness, canopy height, and vegetation density were used to validate ecosystem condition categories.	- Extinction risk was measured at low granularity using the Land-cover change Impacts on Future Extinctions (LIFE) metric (Eyres et al. 2025).
Tools / data sources	- Ecosystem imagery: 10-metre Sentinel-2 satellite imagery, Light Detection and Ranging (LiDAR) data, and Very High Resolution (VHR) aerial imagery (30 cm) - Field data for condition measurements: Quadrat and transect sampling, camera traps, and vegetation diversity indices (Simpson's and Shannon–Weiner) - Landscape-level data: Hansen Global Forest Change v1.12 (2000-2024) (30m resolution)	- Open-source data: LIFE database, IUCN Red List

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

		NPI notes: How feedback was incorporated
All indicators	▶ *Field access/ground-truthing constraint:* limited field access limited the possibilities for ground-truthing. LanzaJet worked with local Indigenous cooperatives, along with local and international ecological experts, providing essential validation and field observations.	▶ The Measurement Guidance was updated to only require ground-truthing at the landscape scale at high granularity and to also include more detail about when and how high resolution remote-sensing data can be used for ground-truthing where site access is restricted
Species	▶ *Dataset availability for species:* as it considered species records for Sarawak and Borneo limited, LanzaJet supplemented open-source data with targeted field data collection and intends to expand future monitoring with environmental DNA (eDNA) surveys.	▶ A Species Selection Filter has been drafted in the Measurement Guidance to help companies prioritise species data collection on where it is most needed. Example data sources are also provided for the estimation approaches at the different granularity levels of species population metrics.

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

According to LanzaJet, the State of Nature metrics offer a common, science-based framework for understanding how business operations interact with ecosystems and biodiversity. They consider knowing their impacts and dependencies on natural capital to be a competitive advantage.

They note that the metrics allow companies to:

- Turn ecological data into actionable insights, enabling informed, low-risk sourcing and land-use decisions.
- Build a credible foundation for nature-based and positive claims, aligned with the likes of the TNFD, SBTN and GRI.
- Help identify priority areas for restoration, protection or regenerative production, thereby both balancing and optimising environmental and business outcomes.
- Create traceable, defensible evidence for investors, regulators and customers.
- Demonstrate how low-carbon fuel production in the SAF industry can also deliver broader ecosystem recovery and regeneration, contributing directly to Natural Capital appreciation
- Leverage scalable, remote data solutions that can offer sufficient granularity levels, helping to complement or reduce over-reliance on costly and logistically challenging manual surveys.

"Using these metrics can help expand SAF's value proposition by showing how renewable fuels can regenerate their own system of supply - rather than deplete. This delivers simultaneous outcomes of risk mitigation and value creation, strengthening SAF's investment attraction and ability to deliver long-term fuel sales"

Daniel Bloch, Director, Strategic Partnerships, LanzaJet

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