



KELP FOREST
FOUNDATION

2025

Annual
Report



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Foreword

Dear Supporters and Stakeholders,

2025 marked the midway point of the UN Ocean Decade, and this has been reflected in the energy, passion and grit that we continue to observe in the ocean community. This year brought together the global community through a series of events in Nice around the United Nations Ocean Conference.

A clear shift can be observed: as a community, we are moving from creating awareness and understanding around the importance of our ocean and coastal ecosystems, to **real solutions being implemented at scale**. This shift is reflected in Kelp Forest Foundation's progress, and we are proud to see our years of building the science turning into measurable results.

When we work towards nature restoration and nature-based solution, the key challenge is measuring the impact of the solution. How much does a healthy kelp forest contribute to biodiversity, water quality, and carbon sequestration?

Once we truly capture the value of a kelp ecosystem in numbers, we believe it will be a no-brainer to adapt kelp as a nature-based solution. Our mission is to continue building these numbers and showcasing how kelp has an incredible impact on our coastlines.

Research

- The groundbreaking study led by Cawthron Institute and Sequench have uncovered the unique barcode of giant kelp (*Macrocystis pyrifera*) - one of the most productive kelp species forming giant forests - for future tracking and analysis of its contribution to biodiversity, carbon sequestration and ocean health.
- The publishing of our white paper quantifying the carbon sequestration over 2024 using state-of-the-art ocean modelling together with atdepth at Kelp Blue's site.
- Three of our MSc scholars graduated - meaning they contributed meaningfully to the global knowledge base around kelp.

Awareness & Storytelling

- Globally, we represented the voice of kelp again, with the highlight being the United Nations Ocean Conference (UNOC) and the events surrounding it, including the One Ocean Science Congress and the Blue Economy Finance Forum in Monaco.
- Our team represented kelp and our work across podcasts, webinars and online teaching classes.

Capacity Building & Ocean Education

- The Blue House Fellowship, our flagship MSc scholarship programme, has continued to support students in their marine science degree – with a clear focus on measuring benefits from cultivated kelp.

From building the science to showcasing in the water

For years, our work has been about establishing the evidence: proving, rigorously and patiently, that kelp forests are worth protecting and restoring. That foundation remains essential — but 2025 marked the shift where we stopped waiting for the complete picture before acting on the parts we already understand.

Every kelp forest we could still lose while refining a model is a forest we cannot get back. So this year, Kelp Forest Foundation moved deliberately from evidence-building toward evidence-in-action: deploying real structures, in real water, and learning as fast as the ocean will let us. We would rather learn from an imperfect reef in the water than from a perfect one on paper.

Our first artificial kelp reef is now deployed – a small, concrete, physical answer to a question we had spent years answering only in theory: can engineered structures support kelp forest growth at scale, in the places that need it most?

"After almost 100 years on the planet, I now understand the most important place on Earth is not on land, but at sea."

– Sir David Attenborough



Xu Ben Zhang
Managing Director



Anne Janssens
Director of Strategy &
Partnerships



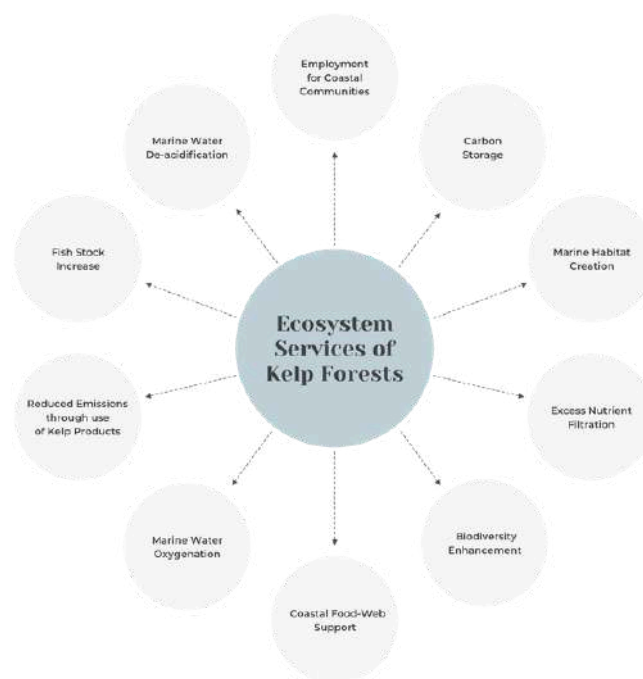
ABOUT

Kelp Forest Foundation

We are a Netherlands-based nonprofit with a mission to unlock kelp as a nature-based solution to restore the health of the planet. We advance kelp science, bridging knowledge gaps by working together with research institutions, coastal communities and industry. Next to our research, we aim to inspire and support the next generation of ocean stewards through education and training.

Why kelp?

Kelp forests are among the most diverse and ecosystems in the world. Covering approximately 25% of the world's coastlines, their estimated value is up to \$500 billion a year, primarily driven by the value of three ecosystem services they provide: fisheries production, nutrient cycling, and carbon removal. Kelp forests act as key marine habitats, where over 1800 species can find food and shelter, acting as an ecosystem engineer, creating a supportive habitat for marine life to thrive in.



Kelp can be processed into many high-value compounds, such as agricultural products, foods, cosmetics, nutraceuticals, packaging, and more. Despite their value, these magical underwater forests have gone largely understudied. At Kelp Forest Foundation, we help deploy kelp as a nature-based solution in coastal waters to restore biodiversity, capture carbon, and protect shorelines, while building the knowledge and standards around kelp.

The **Power** of Kelp

25%

of the world's coastlines are covered by kelp forests (in comparison, only 0.5% of the world's coastlines are coral reefs)

\$500 billion

The world's kelp forests combined provide this value in ecosystem services

1000+

A single kelp forest can host over this many different marine species

Why we exist

Kelp forests - one of the most productive and biodiverse marine ecosystems, are disappearing at an alarming rate, with more than 50% already lost. Despite their importance for biodiversity, coastal resilience and climate regulation, kelp forests remain understudied, underfunded and structurally overlooked in science, policy and markets. This systemic neglect allows the rapid loss of kelp forests to continue, with direct consequences for ocean health and coastal communities.

Mission

Kelp Forest Foundation enables kelp to be valued and applied at scale as a nature-based solution for ocean health. We develop tools, standards and best practices that make kelp's ecosystem services visible, trusted and actionable -unlocking its application at scale across science, policy and markets.

Vision

We envision a world where healthy kelp forests flourish along coastlines worldwide, forming a vital foundation for ocean health, biodiversity, and climate resilience and coastal communities. In this world, Kelp is fully recognized, valued and integrated into science, policy and markets as a nature-based solution for planetary health.

Focus areas



Frameworks & Standards

We identify the scientific questions that are actively blocking kelp from being valued at scale, build the collaborative programs to answer them, and translate findings into the standards and frameworks that policy and markets can work with.



Demonstration Projects

On-the-water pilots with partners that generate real ecological and climate data in real conditions. Designed from the start to be replicable, so what works in one place can be applied somewhere else.



Storytelling and Activation

Projects only create change if the right people hear about them. We translate our work and broader kelp knowledge into content, platforms and narratives that move policymakers, funders and the public to act.

Our **Impact** so far

€2.4m mobilised towards kelp research

ACADEMIC RESEARCH

1

1st ever ocean CDR
model published

21

Research projects

23

Research partners
worldwide

WE FUNDED

11

Master's students

2

PhD students

5

Postdoc
researchers

KNOWLEDGE SHARING

46

Interviews, conferences,
webinars and podcasts

8

Media mentions



ACHIEVEMENTS 2025

Research



Explore the work we carried out in 2025 as part of our mission to scale kelp from a niche scientific curiosity into a widely recognized nature-based solution.

Research themes

Carbon sequestration

Building peer-reviewed methodologies that quantify how much carbon kelp captures — so carbon and biodiversity markets can actually use the data.

Biodiversity & ecosystem health

Developing monitoring frameworks that make kelp's biodiversity value visible and credible, so it can finally count in nature recovery policy and markets.

Coastal resilience

Quantifying how kelp buffers coastlines and supports adjacent marine habitats — creating science that feeds into planning frameworks for ports and coastal managers.

Bioremediation

Measuring kelp's ability to absorb excess nutrients and buffer ocean acidification — directly relevant for ports, fish farms and coastal industries facing tighter regulations.



Blue Carbon Research

Kelp, through photosynthesis, absorbs carbon from surrounding waters and stores it in its tissues. An important research question in our work is to what extent kelp contributes to climate action, and whether this can meaningfully contribute to financial support of kelp cultivation and conservation through carbon credits. Our work focuses on unlocking the carbon credit potential of kelp ecosystems through backing collaborative projects that help build the peer-reviewed methodologies this field needs.

Gold Standard Methodology

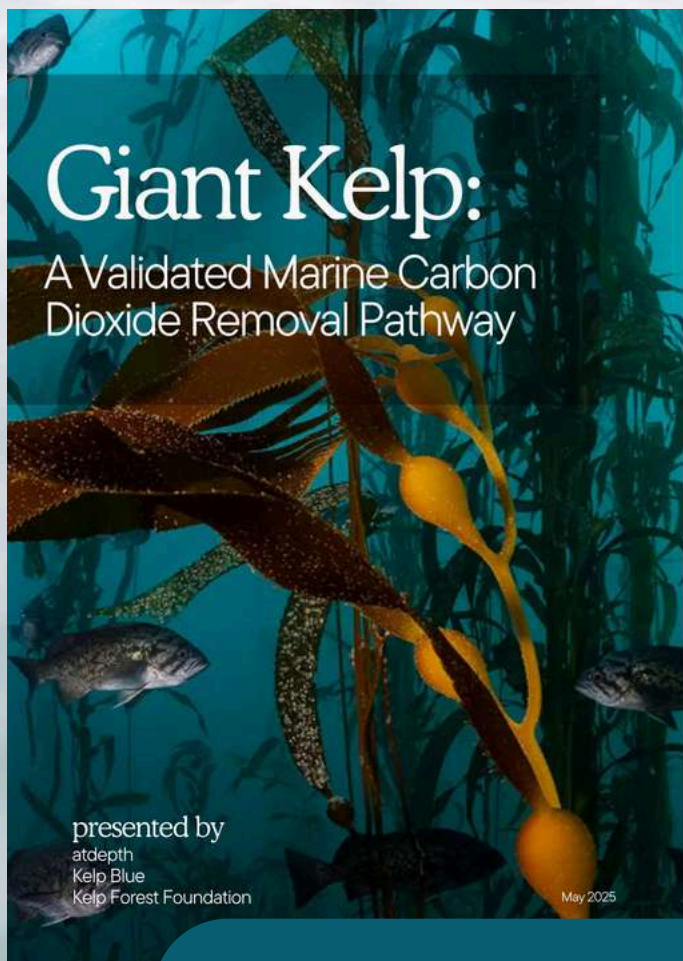
Gold Standard is a leading international body for certifying high-integrity carbon credits, founded in 2003 by WWF and other NGOs. KFF's methodology will be the first internationally recognised standard for measuring carbon sequestration in kelp ecosystems — both wild and farmed — a gap that currently exists nowhere else in the field."

MRV Whitepaper

Through an independent collaboration with [atdepth](#) and [Kelp Blue](#), we achieved the quantification of atmospheric CO₂ removal from an operational kelp farm in Namibia.

eDNA Research

A research collaboration with Cawthron Institute, Sequench, and NatureMetrics investigated the genetic makeup and global divergence of giant kelp with the goal of establishing its unique genetic "fingerprint" for use in eDNA technology. This fingerprint will make it possible to identify giant kelp within samples - particularly in sediment carbon cores - confirming its presence and contribution to long-term carbon sequestration.



Our Whitepaper

Using high-resolution ocean modeling operated by atdepth, and real-world monitoring, the project marks a big step forward for marine carbon dioxide removal (mCDR):

- ✓ Application of a credible way to measure and verify CO₂ removal from kelp
- ✓ Clear distinction between commercial harvest and carbon storage
- ✓ A science-based foundation for future carbon methodologies

Our next step is to ensure this becomes part of open-access certification standards - so that kelp farms and kelp forests worldwide can be incorporated in emerging carbon credit frameworks. For this, we will need to reduce scientific uncertainty around a few topics - which are discussed in the whitepaper.



Gold Standard Methodology

For kelp to enter climate markets, the science must translate into accepted standards for permanence (how long carbon stays stored) and attribution (proving it came from kelp). KFF is developing a Gold Standard methodology to quantify carbon sequestration from kelp cultivation, restoration, and conservation — flexible enough to apply across sites, species, and project types.

- First methodology draft submitted to Gold Standard in early 2024; currently under revision
- First time kelp carbon is assessed against the same criteria as other natural climate solutions
- Modeled in spirit on Japan's J-Blue Credit system, but designed as an internationally applicable framework

eDNA Biomarkers, with Cawthron Institute, Sequench and NatureMetrics

Traditional methods like isotopes or lipid markers cannot reliably prove that buried carbon came from kelp rather than other marine sources. KFF is working with the Cawthron Institute and Sequench in New Zealand to develop eDNA tools that trace kelp carbon directly to its source.

- Building a genetic “fingerprint” library for giant kelp (*Macrocystis pyrifera*)
- Detects kelp DNA in trace amounts within sediment, even far from the source forest
- Scalable, non-invasive, and highly sensitive — unlike older indirect tracing methods
- Lets researchers test, rather than assume, whether kelp fragments reach deep-sea burial sites — putting attribution on firmer scientific ground.

Sessile Marine Invertebrates in Kelp Forests

RESEARCH PROJECT

Marine Invertebrates Diversity in Kelp Farms and Native Kelp Forests

Research Overview

This MSc study assessed the diversity, evenness, and community composition of sessile marine invertebrates (an organism that is fixed permanently to a surface like a rock, reef, or the ocean floor) on artificial structures within a kelp farm compared to adjacent natural kelp forests along the Namibian coast. The research evaluated how substrate type and habitat age influence community assembly in cultivated kelp systems.

Key Findings

Natural kelp forests had a wider, more balanced mix of species. Kelp farms, on the other hand, had fewer species overall and were mostly taken over by fast-growing opportunists like mussels and sea anemones. This suggests that man-made farm structures — especially in newer or actively managed farms — tend to favor a handful of quick, competitive species rather than a diverse community.

Impact and Contribution

These findings help us understand how life develops around kelp farms and how the farm structures themselves shape which species thrive. This knowledge can guide better farm design and ocean planning, helping farms support more biodiversity without sacrificing how much kelp they produce.

MSC STUDENT DORTEA HAMUKOTO'S 2025



January 2025

Field sample collections



March 2025

Submitted thesis



July 2025

Joined SEAmester



September 2025

SANUMARC conference

Rock Lobster Habitat Cultivated vs. Natural Kelp Forests

RESEARCH PROJECT

Comparative Assessment of Rock Lobster Habitat Use in Cultivated vs. Natural kelp Forests and Fish Larvae Associations.

Research Overview

This study compared habitat use of West Coast rock lobster (*Jasus lalandii*) – a key commercial species in the area relying on the rocky reefs and protective shelter provided by giant kelp – in cultivated and natural kelp forests off Lüderitz, Namibia. The research assessed lobster abundance, size structure, sex ratios, and larval diversity to determine the ecological role of cultivated kelp systems.

Key Findings

Cultivated kelp supported significantly higher lobster abundance with predominantly smaller juvenile lobsters, indicating nursery habitat function. Natural kelp forests hosted larger, adult lobsters and showed a male-biased sex ratio, suggesting reproductive habitat importance. Fish larvae were 11 times more likely to occur in cultivated kelp, with eight taxa recorded and multiple developmental stages observed, highlighting active habitat use and high biodiversity.

Impact and Contribution

The findings demonstrate that cultivated kelp forests enhance juvenile recruitment and biodiversity, while natural kelp forests support adult reproductive populations. Together, these complementary roles highlight the ecological benefits of kelp aquaculture and its potential contribution to fisheries sustainability and coastal ecosystem management.

MSC STUDENT SAKARIAS MALYENGE'S 2025



April 2025

Concluded fish larvae and
lobster sampling



August 2025

Submitted thesis



September 2025

Presented at SANUMARC



November 2025

Submitted Manuscript for review
to Regional Studies in Marine
Science

Ocean Acidification and Kelp Forests

RESEARCH PROJECT

Ocean Acidification in Kelp Farms and Native Kelp Forests

Research Overview

Paula's MSc research explored how kelp takes up carbonic acid during growth to buffer ocean acidification. Her work included field sampling, laboratory processing, and data management. These activities established the foundation for the final phase of data analysis and thesis development, with submission and defence planned in 2026.

Key Findings

Data analysis is currently underway, and findings will be communicated following validation and interpretation.

Impact and Contribution

Paula contributed to scientific engagement by presenting on ocean acidification at the 2025 Annual Research Conference, raising awareness on key environmental challenges. She also supported knowledge exchange by moderating a conference session and participated in outreach initiatives, including the Lüderitz Blue School Ocean's Day Club and field-based learning activities.

MSC STUDENT PAULA SACHEUS' 2025 SNAPSHOT



January 2025

*Joined
OceanX and OceanQuest*



May 2025

*Inspiring the next generation of
marine scientists*



September 2025

*Hosting a talk on ocean
acidification SANUMARC*



November 2025

AAORIA forum, Belgium

Cultivated Kelp Forests and Nutrient Cycling

RESEARCH PROJECT

Kelp Forest Nutrient Dynamics and their influence on phytoplankton communities along the Namibian coast

Research Overview

This study investigates the role of cultivated kelp (*Macrocystis pyrifera*) in nutrient cycling and phytoplankton dynamics along the Namibian coast (Lüderitz). A structured multi-site sampling regime was established from November 2025 to April 2026, generating spatial and temporal data on environmental conditions, nutrient concentrations, and phytoplankton communities. Kelp tissue nutrient analysis is currently underway to complete the dataset.

Key Findings

Environmental conditions showed notable variability (12.2–18.5 °C; salinity 29.9–35.2 ppt). Nutrient concentrations remained low but measurable, while phytoplankton cell counts increased substantially from 356 (December) to 3,680 (February), indicating seasonal productivity shifts potentially influenced by cultivated kelp.

Impact and Contribution

This research provides baseline data on cultivated kelp systems in Namibia, improving understanding of their role in nutrient cycling and coastal productivity. The findings support sustainable kelp aquaculture development and inform future coastal ecosystem management along the Namibian coast.

MSC STUDENT UASORA KAUTA'S 2025 SNAPSHOT



January 2025

Field work



May 2025

Inspiring the next generation of
marine scientists



September 2025

SANUMARC conference



November 2025

RGNO training



Advocacy and Awareness

EVENTS



Clean Decade Program for Blue Carbon

Ocean Decade Programme

We received a UN Ocean Decade Endorsement

The Blue House Fellowship Program was endorsed by the UN Ocean Decade, as part of the “Global Ecosystem for Ocean Solutions” (GEOS) initiative, led by Ocean Visions. This recognition highlights our commitment to supporting early-career professionals from coastal communities through scholarships, research opportunities, and essential skills training.

Our head of reforestation was appointed Secretariat of International Affairs by JBE

Our Head of Reforestation, Brian Tsuyoshi Takeda, was appointed Secretariat of International Affairs by the Japan Blue Economy Association (JBE).

Brian now works closely with global partners to help share lessons from Japan’s experience, and provide real-world context from his own hands-on work restoring wild kelp forests and developing blue natural capital credits.



World Economic Forum, Davos

Connecting with some 3,000 participants among whom are investors, business leaders, political leaders, economists and journalists, for a five-day summit discussing global issues.



One Ocean Science Congress

UNOC3 Special Event dedicated to Science, and to provide Heads of State, Government, and the broader society, with comprehensive scientific insights on the Ocean's health and future trajectory. Science-informed decisions should enable the conservation and sustainable use of the Ocean, optimize the solutions it offers, and safeguard the services and benefits it provides.

Blue Economy Finance Forum, Monaco

Our team KFF at the BEFF hosted in Monaco. Xu had the chance to present and highlight just how much of the world's coastlines are covered by kelp forests, and the ecosystem services they provide and their potential worth of \$500 billion per year globally.



United Nations Ocean Conference 3

UNOC3 offered a powerful platform to build new collaborations, advocate for blue carbon ecosystems, and start the conversation around kelp being recognized as a key player in the global ocean agenda.



London Climate Action Week

We joined an exciting event hosted by Kat Bruce and partners NatureMetrics, Better Worlds, Sea Change Row & The Protected Areas Foundation. Sea Change brought scientists, innovators, artists, and coastal communities together to spotlight the urgent need and opportunity for ocean recovery bringing in elements of adventure, science and storytelling.

KFF at SANUMARC

Under the theme: “A Multidisciplinary Approach to the Climate Change, Food Security, Blue Economy Nexus.” It was an opportunity to learn, share knowledge, network, and engage with some of the best researchers in the SADC region. Paula, one of our Blue House fellows, was chair on a session on Policy Frameworks, introducing speakers, and highlighting the work of smart, innovative young scientists. During her presentation, she raised awareness about establishing a long-term ocean acidification monitoring along Namibia’s 1,750 km coastline. Another KFF speaker was Dorteia, who presented her research on the diversity and abundance of sessile marine invertebrates in the local kelp forest and kelp farm.



AAORIA Forum - Brussels, BE

Paula attended the four-day Intergenerational Dialogue Workshop, where she deepened her understanding of the BBNJ Treaty, contributed to an ocean awareness campaign presented to the AAORIA High-Level Board, and participated in the launch of the Blue Generational Program.



Hope Zones Foundation - Nazaré, PT

Hope Zones Foundation hosted a series of public events, beginning with the Seaweed & Sustainability Summit at the Cine Teatro Nazaré. The conference explored a wide range of themes ranging from regenerative seaweed farming, ocean education, sustainable tourism, and blue finance. We had the opportunity to give a talk on regenerative kelp farming practices. The following day, all attendees could join an inspiring three-hour Ocean Collage workshop on ocean education - diving into our impact on marine ecosystems, and the solutions ahead.

1% for the Planet, Amsterdam

We also attended the 1% for the Planet Sessions: Amsterdam, hosted at Patagonia. We've been proud 1% for the Planet environmental partners for over 3 years now, and it was great to be invited to showcase our work to a room full of curious, committed changemakers and 1% member businesses.



HALO Convening, Maine

Paula got the opportunity to contribute data from her ongoing MSc research at the Halo Convening in October, funded by WWF and hosted by Bigelow Laboratory for Ocean Sciences. The workshop, led by Dr. Nichole Price, brought together a team from around the world to explore the impact of seaweed farms on water quality with study sites stretching across various continents.

MEDIA MENTIONS

Breach the Surface Webinar

Breach the Surface is an organization expanding access to ocean education through mixed media resources that improve ocean literacy rates. Their podcast, Shellphone, and webinar series, Ocean Class, offer educational episodes and discussions on the different topics concerning our oceans.

Xu introduced Kelp Forests in the first pilot episode of the webinar series. We call it a Kelp Forest 101 - a first dive into what they are, what role they play and why they are important.



NatureBuilders Podcast

Our Head of Reforestation, Brian, was a guest on NatureBuilders Podcast. Listeners get to explore kelp forests and how Japan is leading the way with state-backed blue carbon credit systems.

Team

Core Team



Xu Ben Zhang
Managing Director



Anne Janssens
Director Strategy & Partnerships



Tiaan Engelbrecht
Marine Researcher



Maxine Mathias
Communications Officer



Brian Tsuyoshi Takeda
Head of Reforestation

Board of Directors



Arjan Poels



Dr. Kat Bruce Vincent Doumeizel



Sarah Mathies



Daniel Hooft

Scientific Advisory



Dr. Ian Hendy



Prof. Carlos Duarte



Dr. Finn Ross

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Great Island Foundation



**J, C & R KREDIET
CHARITABLE
FOUNDATION**



**PRINCE ALBERT II
OF MONACO
FOUNDATION**



Stolt-Nielsen



WANT TO SUPPORT US? GET IN TOUCH
Contact us at info@kelpforestfoundation.org

Financial statement

BALANCE SHEET

(after allocation balance of income and expenses)

ASSETS

Cash at bank	€	350.839
Current assets	€	0

Total assets € **350.839**

LIABILITIES

Current liabilities	€	16.636
Other reserves	€	334.203

Total liabilities € **350.839**

PROFIT AND LOSS STATEMENT

INCOME

Income from companies	€	21.232
Income from non-profits	€	370.655

Total income € **394.433**

Income minus expenses € **87.555**

EXPENSES

Spend on objectives	€	298.594
Cost of management/admin	€	7.046

Financial expenses € 1.238

Total expenses € **306.878**



KELP FOREST
FOUNDATION

STICHTING KELP FOREST FOUNDATION

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