

CARY SCIENCE CONVERSATION

VIRTUAL EVENT

Restoring Resilient Tropical Forests

Presented by

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www.caryinstitute.org

FIELD STUDY SITES



Panama



Ecuador



Brazil



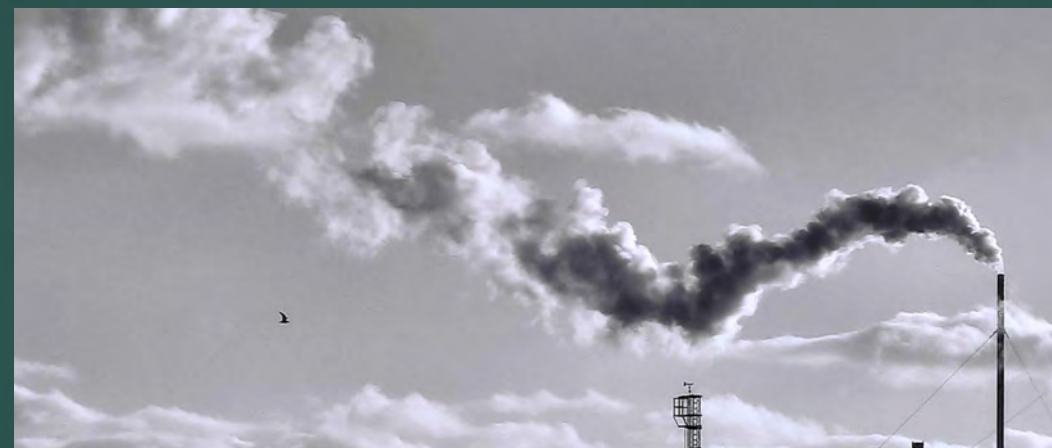
GLOBAL CARBON BUDGET

In billion tons CO₂/yr (GtCO₂), average 2010-2019

TOTAL EMISSIONS: +40



Fossil fuels & industry



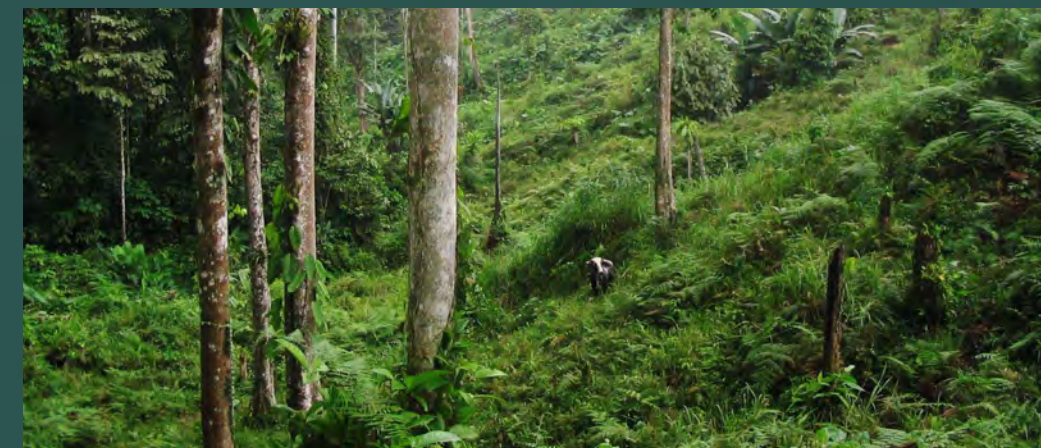
Land use change



TOTAL SINKS: -22



Land sink



Ocean sink



FOREST CARBON CYCLE

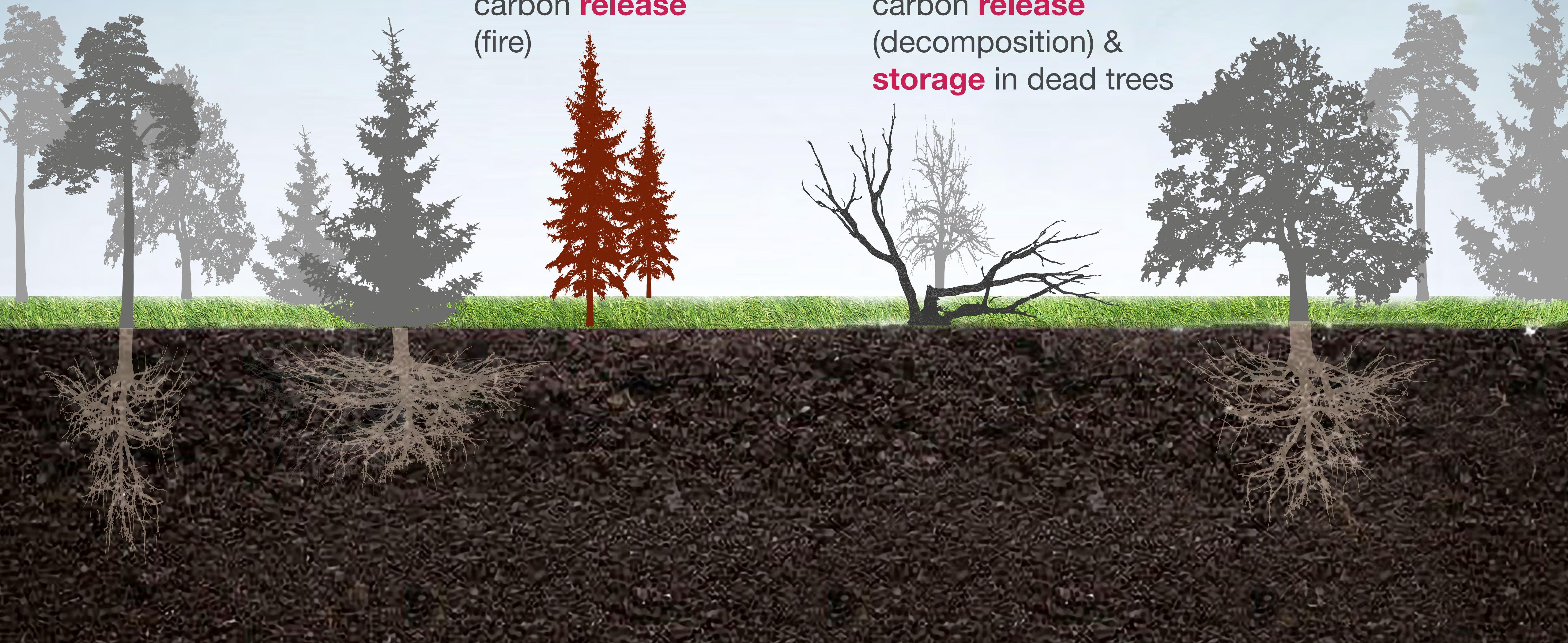
carbon **uptake** &
storage (growth)

carbon **uptake** &
storage (re-growth)

CARBON

carbon **release**
(fire)

carbon **release**
(decomposition) &
storage in dead trees



TROPICAL FORESTS & CARBON BUDGET

Existing tropical forest

Re-growing tropical forest

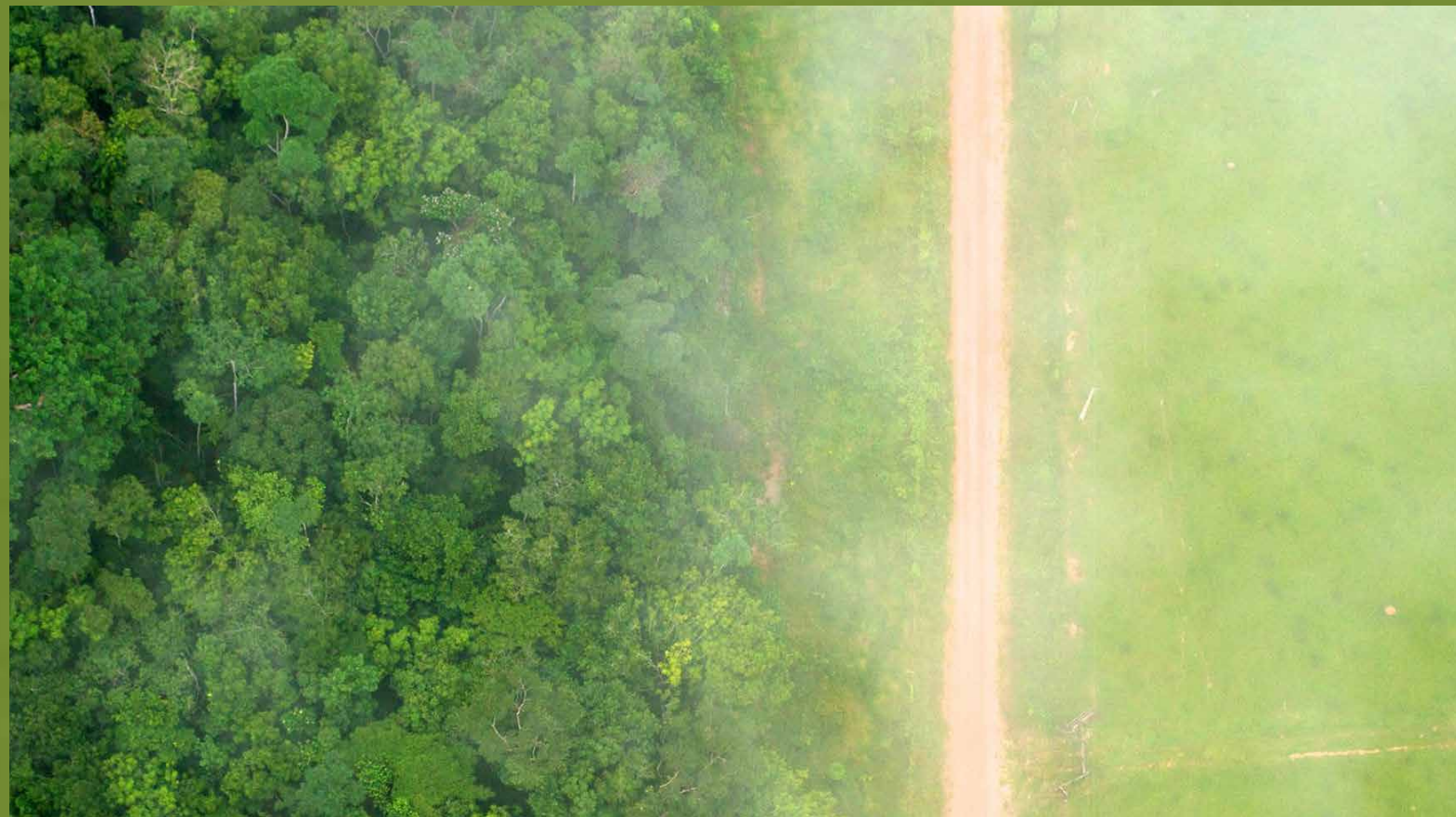
Tropical deforestation



TROPICAL FORESTS AS CARBON SINKS: CHALLENGES

70%

of global forest sinks
are in the tropics



halt deforestation

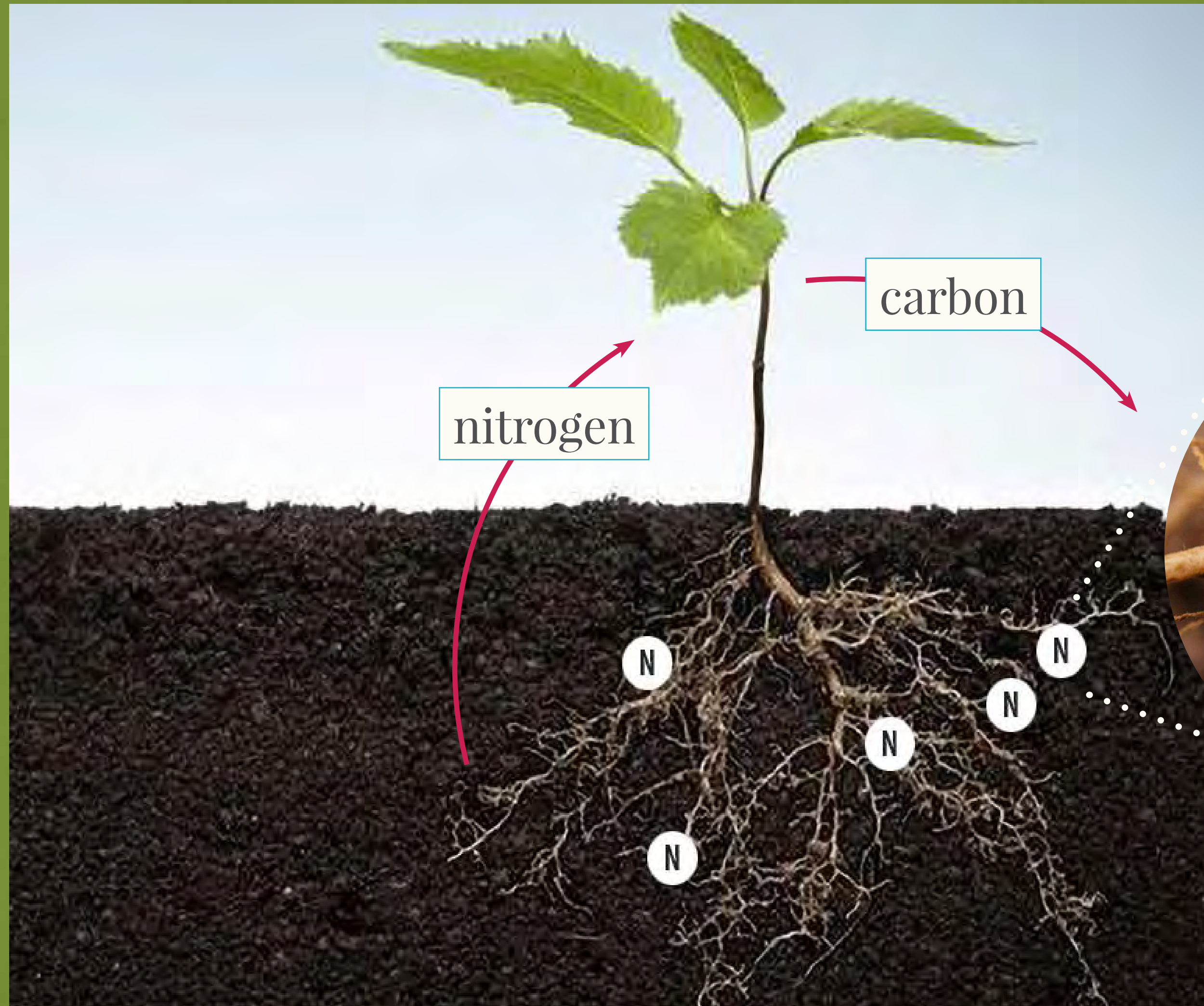


protect existing forests



return degraded lands to forest

TREE GROWTH & NITROGEN FIXATION



home for 'fixing' bacteria

NITROGEN FIXERS OF TROPICAL FORESTS

support biodiversity



fertilize soils



help forests grow back
faster & trap more carbon



Tachigali

REFORESTATION & NITROGEN FIXERS

NITROGEN-FIXING TREES



The Bonn Challenge

A global goal to bring 350 million hectares of degraded and deforested landscapes into restoration by 2030



COULD SEQUESTER ADDITIONAL

6.7 GTCO₂

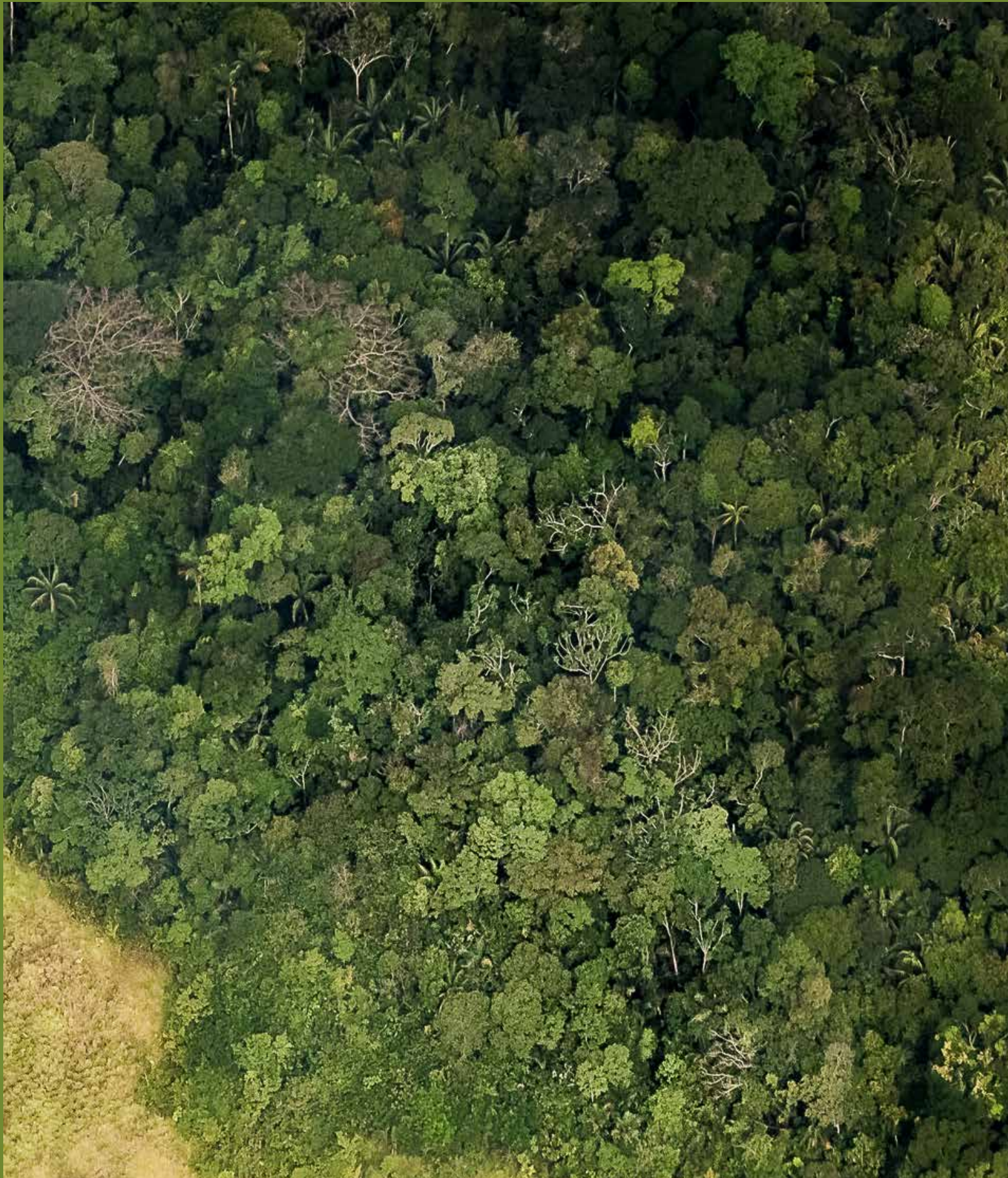
OVER NEXT 20 YEARS



5 years of US vehicle emissions

RESILIENT FORESTS OF THE FUTURE

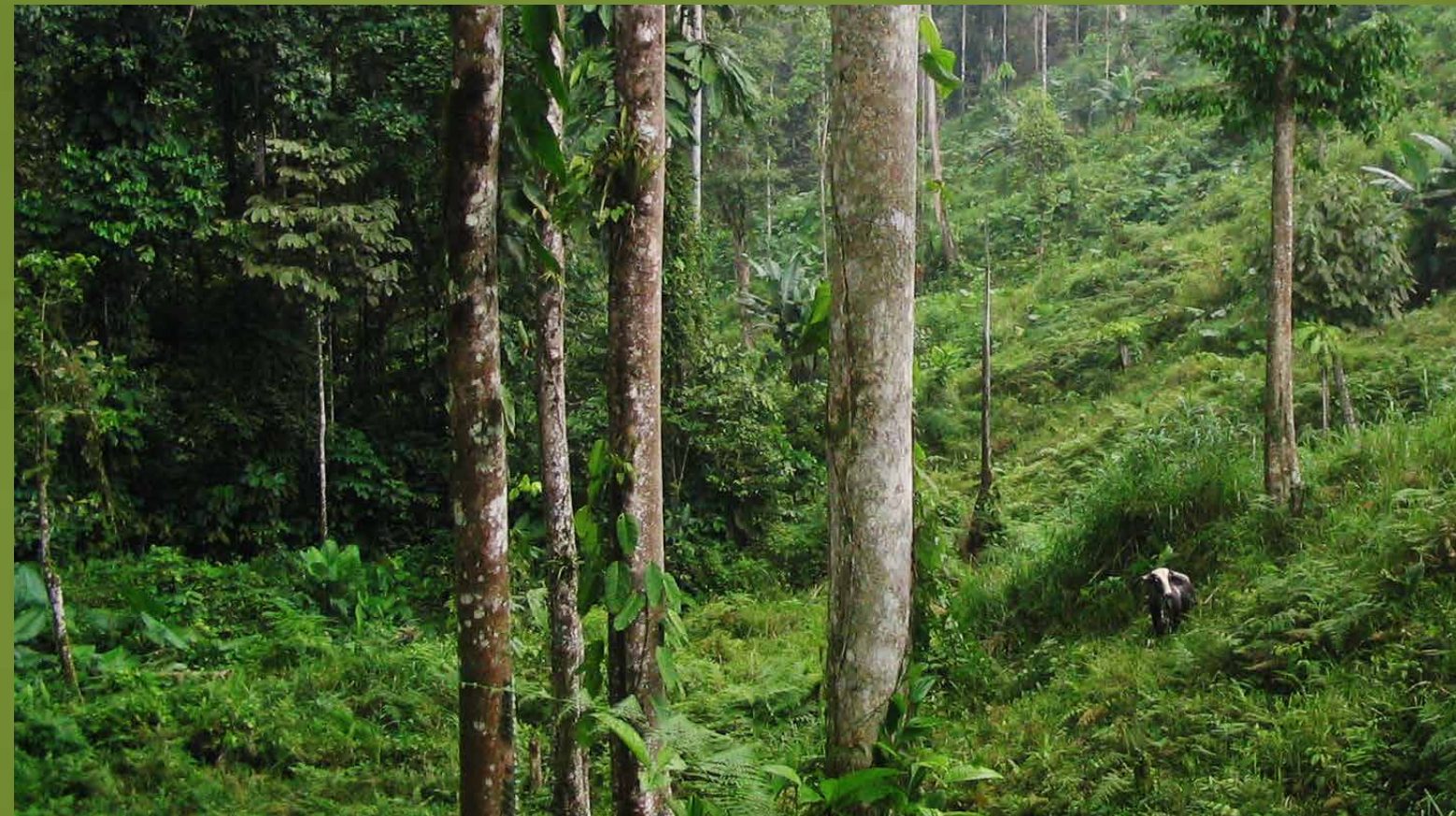
PROTECT TROPICAL FORESTS



STRATEGIC RESTORATION

Do

Plant a diverse mix of tree species



Avoid

Planting 'plantations' of non-native tree species like eucalyptus or pine or limited species mixes



FROM SCIENCE TO MANAGEMENT PRACTICES

GOAL: Develop a science-based recipe for reforestation success

WHAT WE ARE EXPLORING...



The importance, function, and diversity of nitrogen-fixing trees

The unique roles played by all trees

How nutrients influence forest growth and carbon storage

RECOMMENDATIONS

- ✓ Plant diverse tree species or allow diverse species to grow back
- ✓ Ensure there are some, but not all, nitrogen-fixers
- ✓ Select tree species to fulfill specific roles
- ✓ Pay attention to soils

WHAT CAN YOU DO?

Minimize Your Impact



Reduce your carbon footprint and offset the rest

Decrease consumption of beef and palm oil

Buy responsibly sourced products

Support Science



Reforestation efforts are more effective when science informs management choices

Use Your Voice



Value the climate benefits of forests through a carbon price

RESEARCH SUPPORTERS

LEVERHULME
TRUST



NERC
SCIENCE OF THE
ENVIRONMENT