



Long-term woodland monitoring supports better management decisions

How quickly trees grow matters for sustainable harvesting, woodland productivity and understanding carbon sequestration. Research from protected teak woodlands in north-western Zimbabwe provides rare long-term evidence on how woodland recovery is shaped by tree growth rates, competition and changing environmental conditions.

THE RESEARCH AT A GLANCE

To assess woodland productivity and tree growth dynamics over time, research was conducted in north-western Zimbabwe from 1994–2021.



27 years
of ecological
monitoring



2,466
individual tree
stems



33
woodland
species

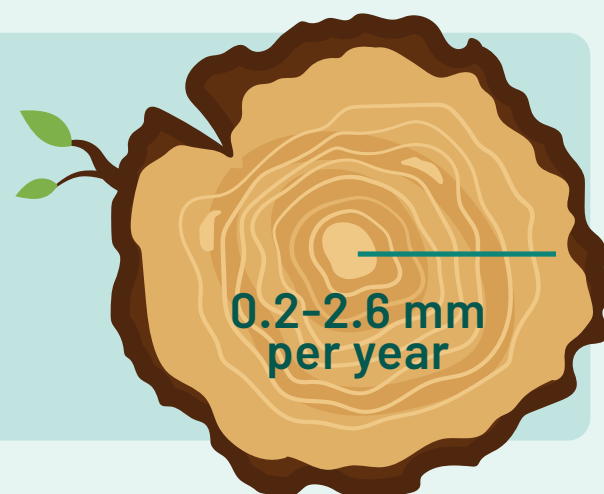


11
permanent
sample plots

3 key insights for woodland management

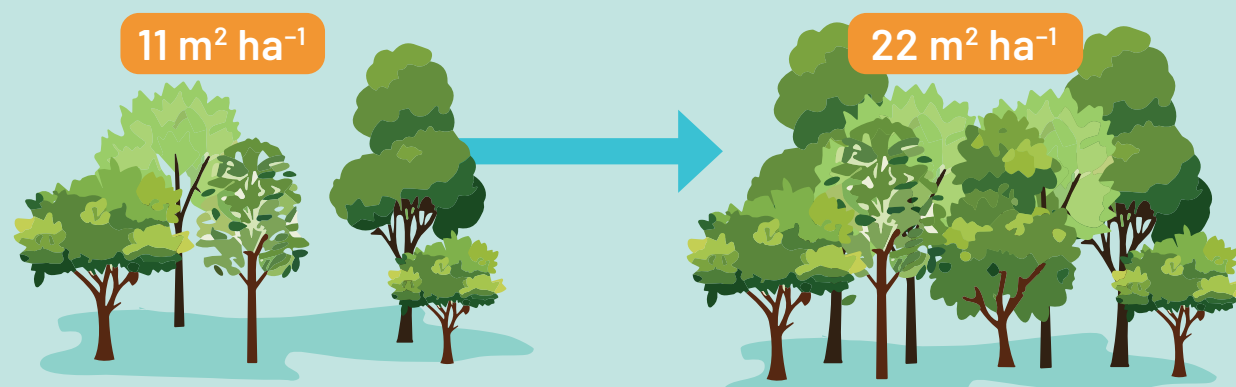
1 Woodland recovery takes time

Key timber species take around 150 years on average to grow from 5 cm to a harvestable diameter of 35 cm.



2 Growth depends on woodland and environmental conditions

Tree growth is not determined by time alone. Tree-to-tree competition can substantially slow growth. Growth also increased during periods of higher water availability and at higher atmospheric CO₂ concentrations.



Time to harvestable size increases from **189 years** to **419 years**.

3 Long-term monitoring is a strategic investment

Woodland productivity changes over time. Across the 27-year monitoring period, trees experienced considerable variation in water availability, including periods affected by severe drought and flooding. Monitoring over decades makes it possible to identify changes in woodland recovery, growth and productivity that short-term assessments cannot capture.



A tagged tree inside a PSP; SEOSAW and Zimbabwe Forestry Commission Team collecting data from the PSPs in the Teak woodlands in Gwampa Forest Reserve, Zimbabwe.

SUGGESTED SUSTAINABLE HARVESTING GUIDELINES



Align harvesting cycles with tree growth rates and growing stock.



Reduce competition through intermediate thinning, including provision of firewood and poles.



Apply species-specific silvicultural prescriptions to manage residual stock and reflect differences in species growth and recovery.



Continue long-term monitoring through permanent sample plots to track woodland productivity, growth and recovery over time.

Find out more! Visit futureecosystems-africa.org or scan the QR code below and download the policy brief.

