

From Urban Timber to Ecological Citizenship

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ART, ARCHITECTURE, DESIGN

Royal Danish Academy
Architecture Design Conservation

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The Clearing - Lesnes Abbey Woods, Bexley, London

Aim:

Enhance ecological citizenship in Lesnes Abbey Woods by creating community-made woodland furniture from local hardwood timber, using digital design tools and volunteer engagement.

Why?

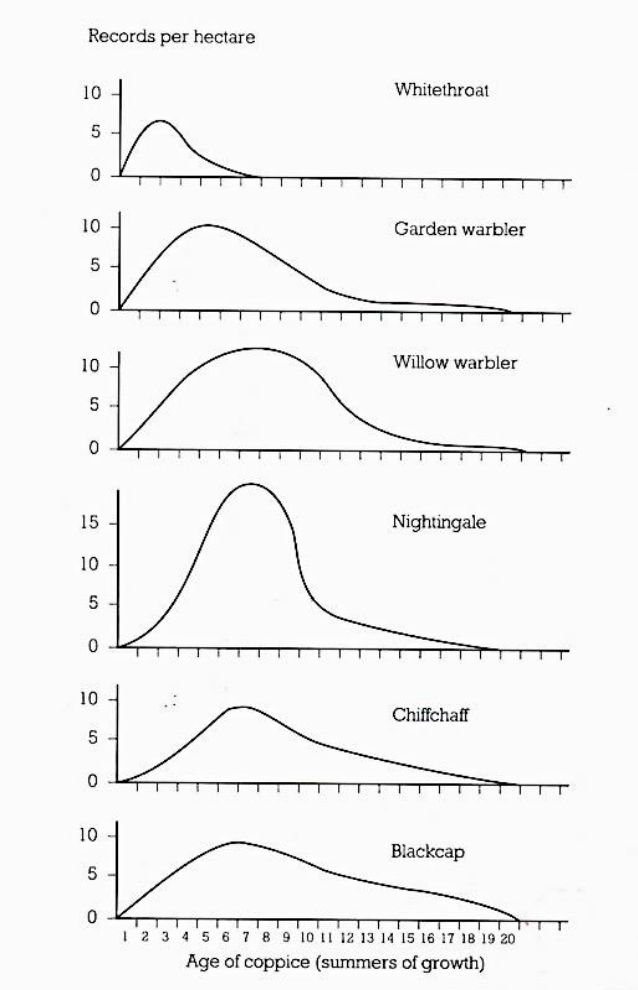
Active woodland management increases biodiversity and enhances public access. Our furniture demonstrates viable uses for overlooked urban hardwood timber. The community making process encourages local ecological advocacy.



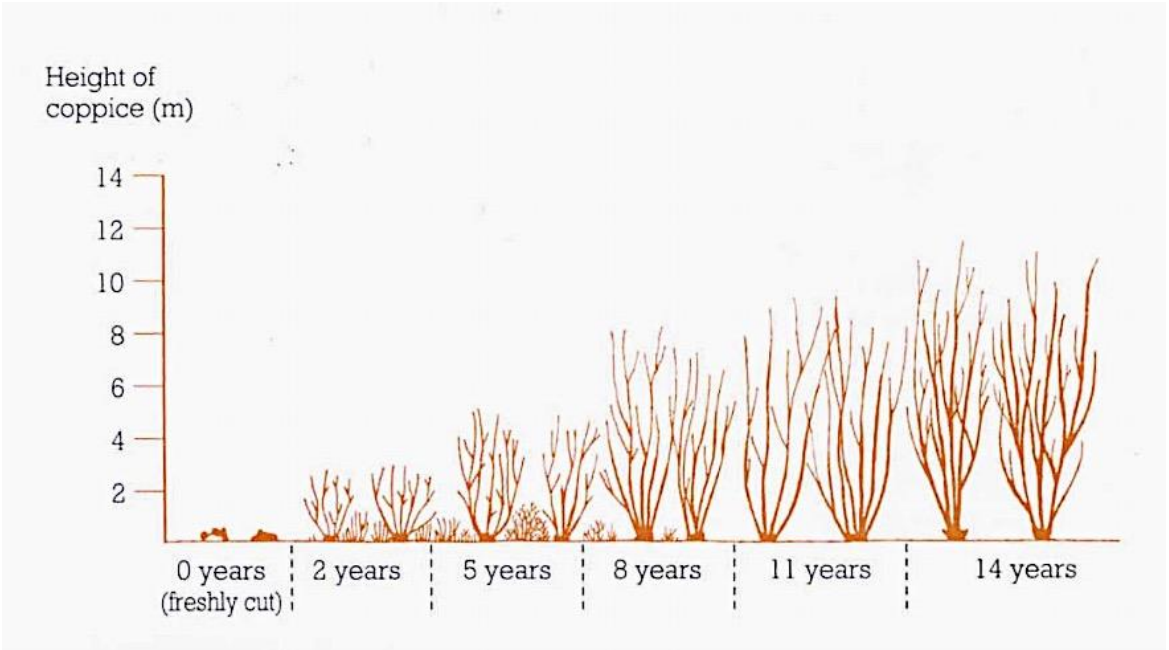


Source: Forest Research. 2022a. Forestry facts & figures 2022.

Active woodland management good for biodiversity and bioregional materials



Abundance of breeding migrant birds in a Kentish woodland in relation to the age of coppice
from; Fuller, R. J., and Martin S. Warren. Coppiced woodlands: their management for wildlife. London:: Joint Nature Conservation Committee, 1993.



Height of Coppice / ground flora biodiversity in relation to age of coppice
from; ; Fuller, R. J., and Martin S. Warren. Coppiced woodlands: their management for wildlife. London:: Joint Nature Conservation Committee, 1993.

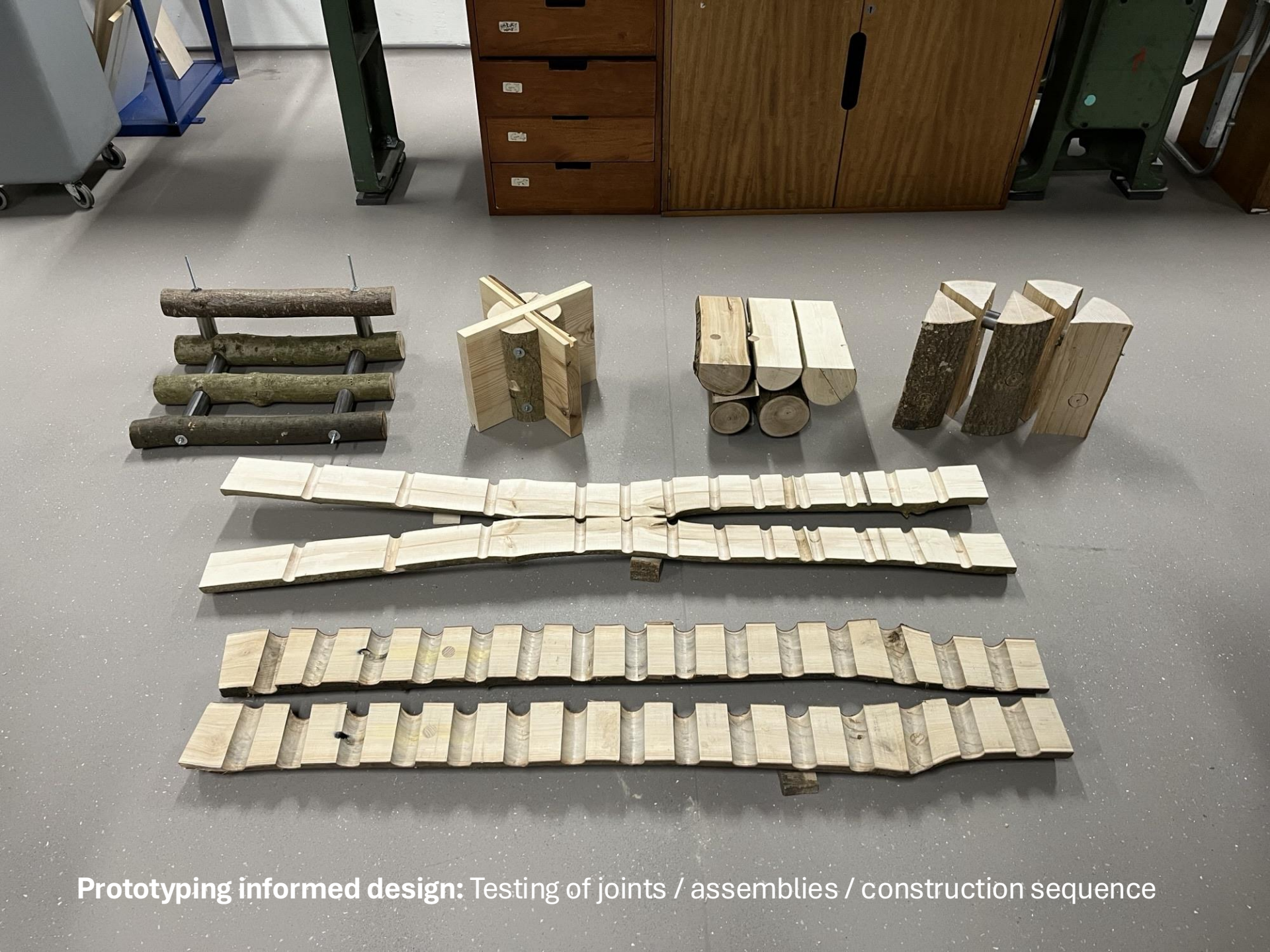

Volunteers: Ecological tours + Experiential Making



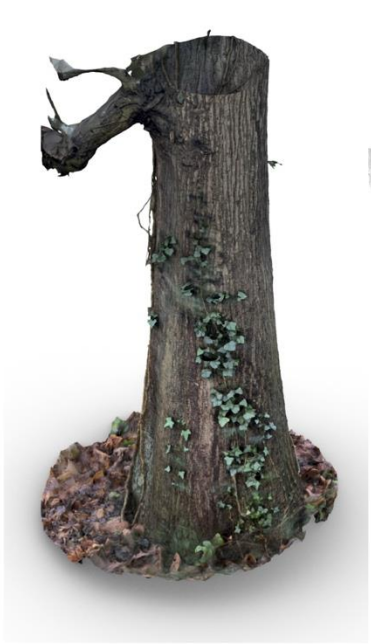


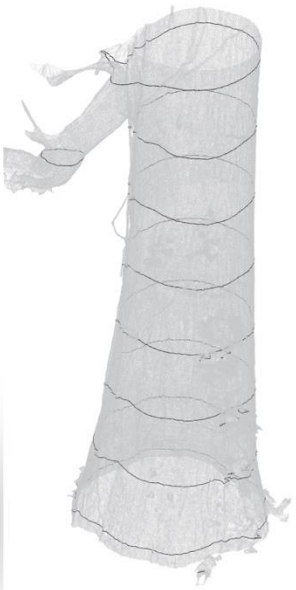
Volunteers: Simple craft processes + low cost tools = likelihood of replicability

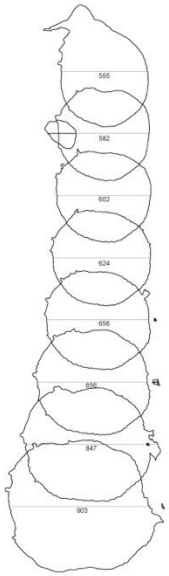


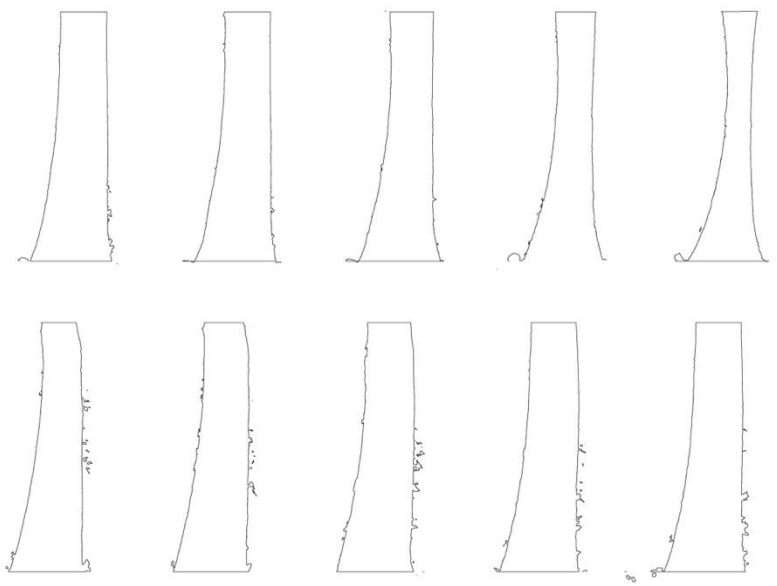


Prototyping informed design: Testing of joints / assemblies / construction sequence





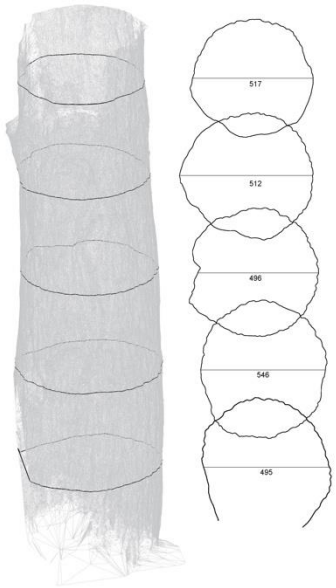


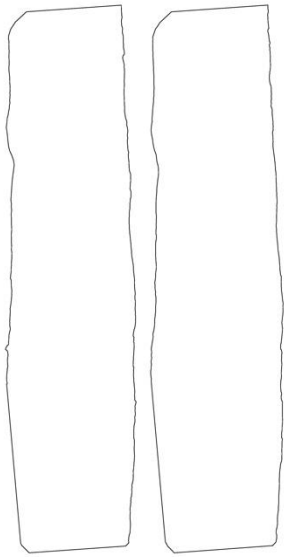


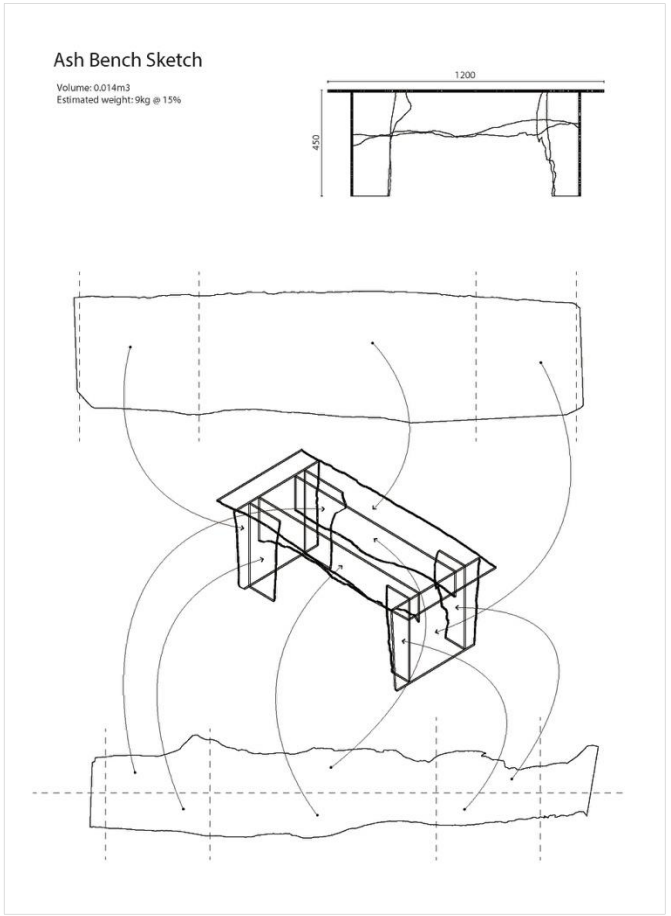
Tree scanning (photogrammetry)

Enables simulated ‘digital sawmilling’ of trunk to determine tree selection / felling









‘Digital sawmilling’ of tree scans: informs design & precision forestry decisions

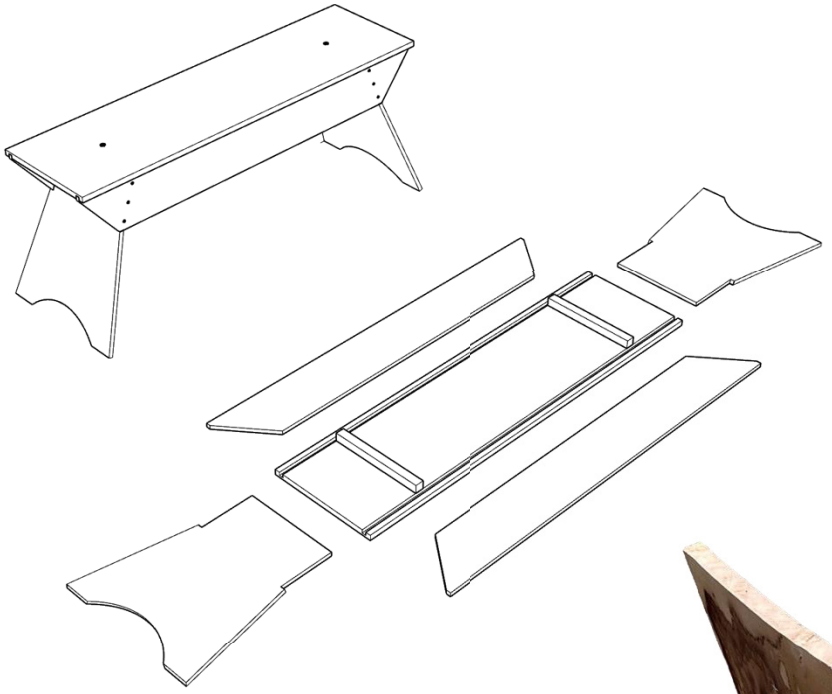


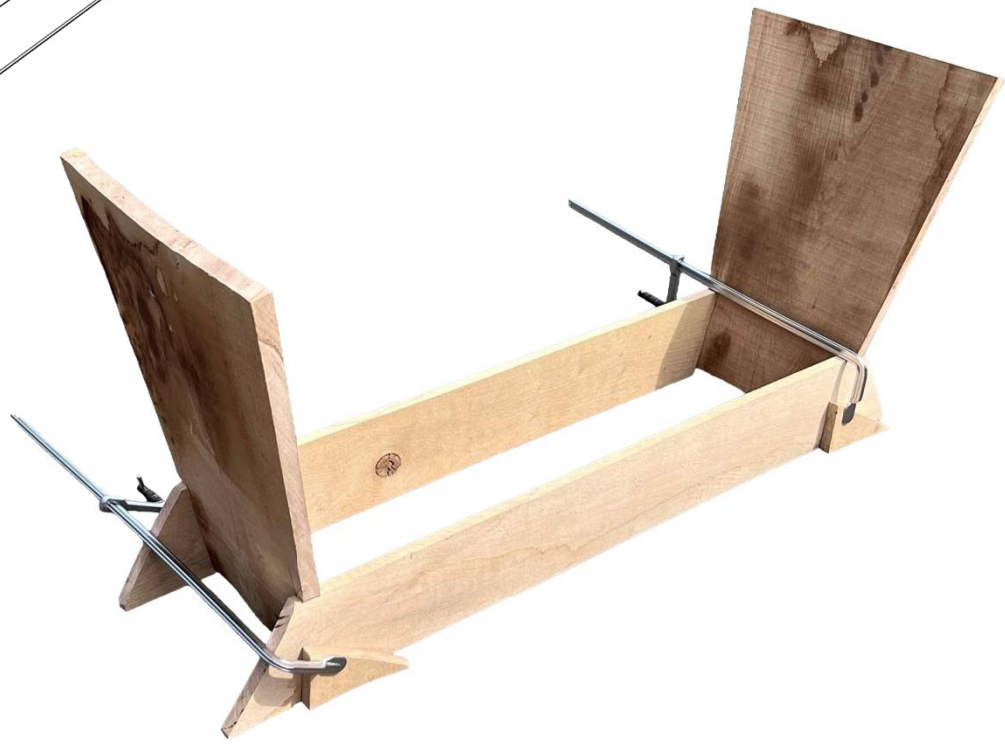




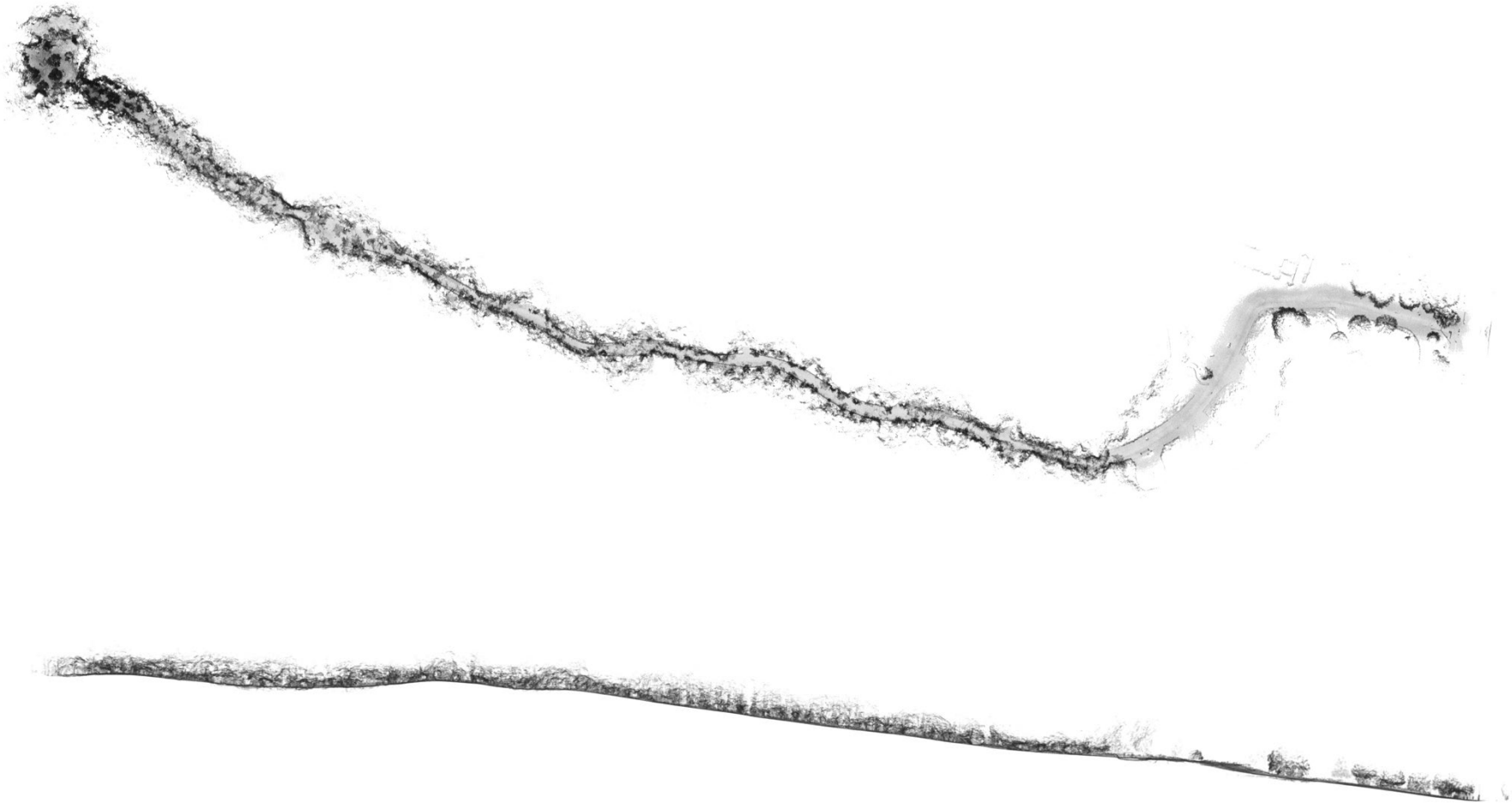


In-situ mobile sawmilling: Bioregional processing

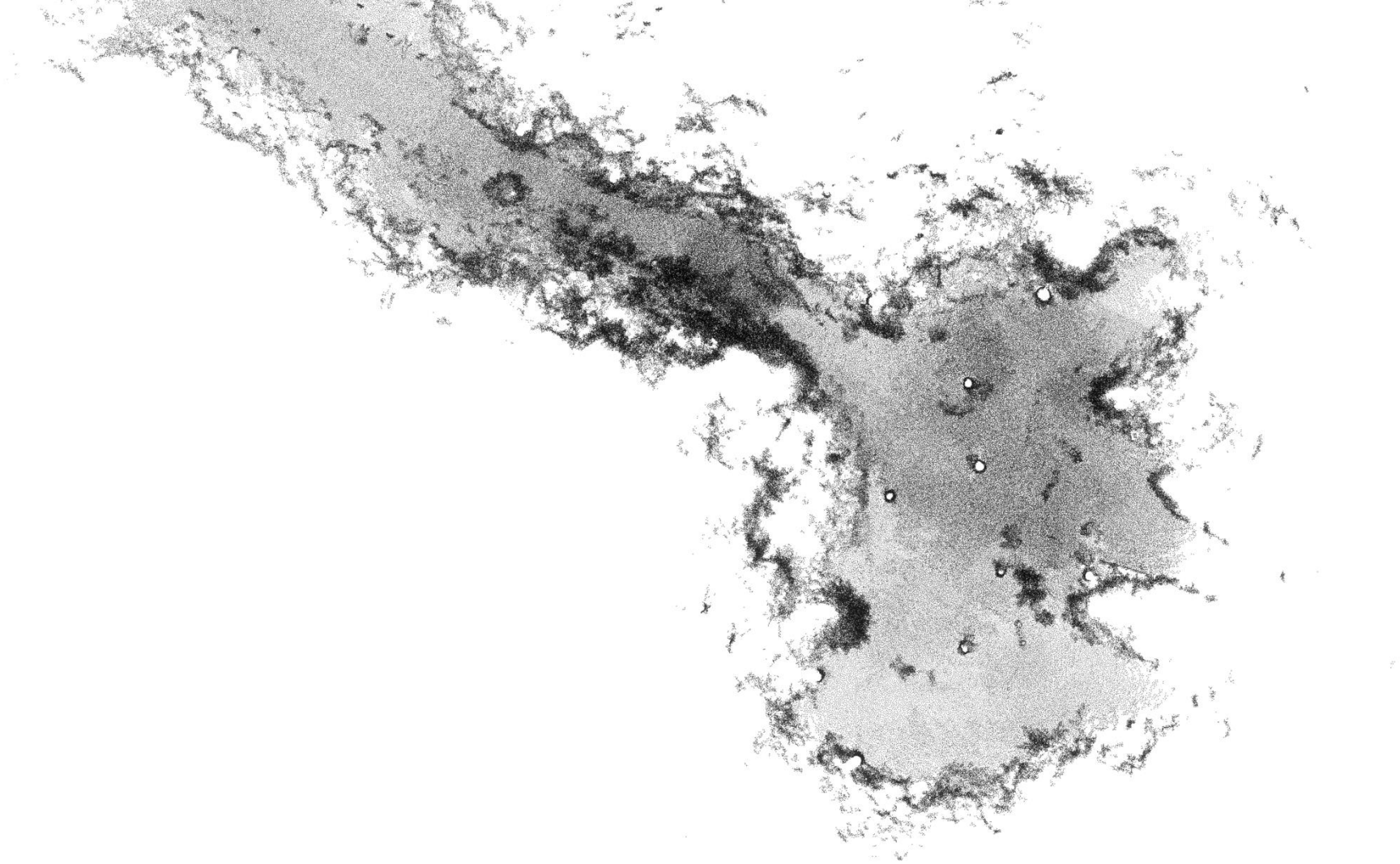




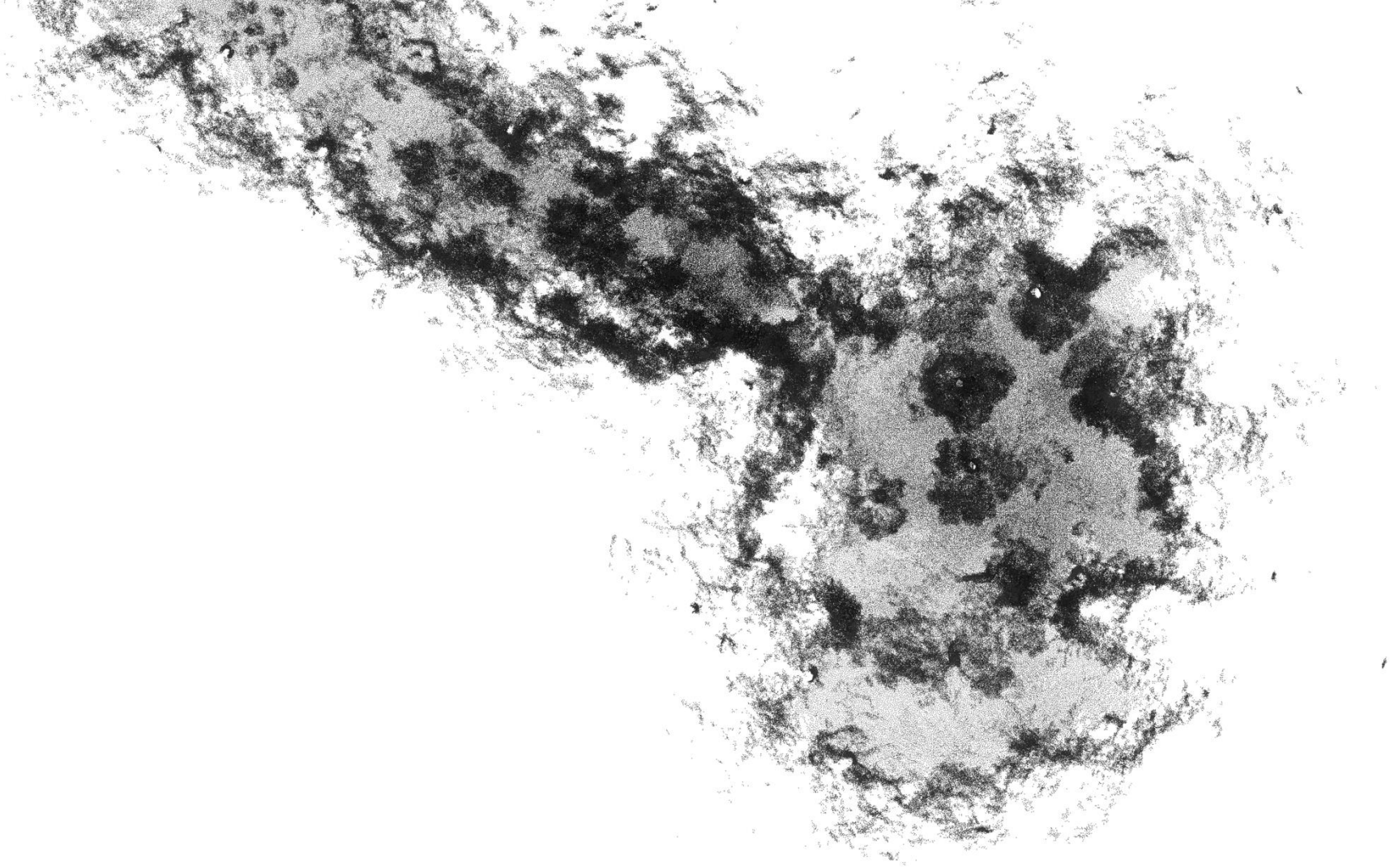
Simple, cost-effective processes: sawmill direct to unseasoned assembly



LiDAR scan of woodland route for tree felling /mobile sawmill access / removal
Top: Plan view.
Bottom: Long elevation view.



LiDAR scan - felling site: Monitoring of regrowth / evidencing biodiversity
Plan view: site after felling of mature oak and sweet chestnut coppice.



LiDAR scan - felling site: Monitoring of regrowth / evidencing biodiversity
Plan view: re-scan to capture/evidence biodiversity benefits of active harvesting



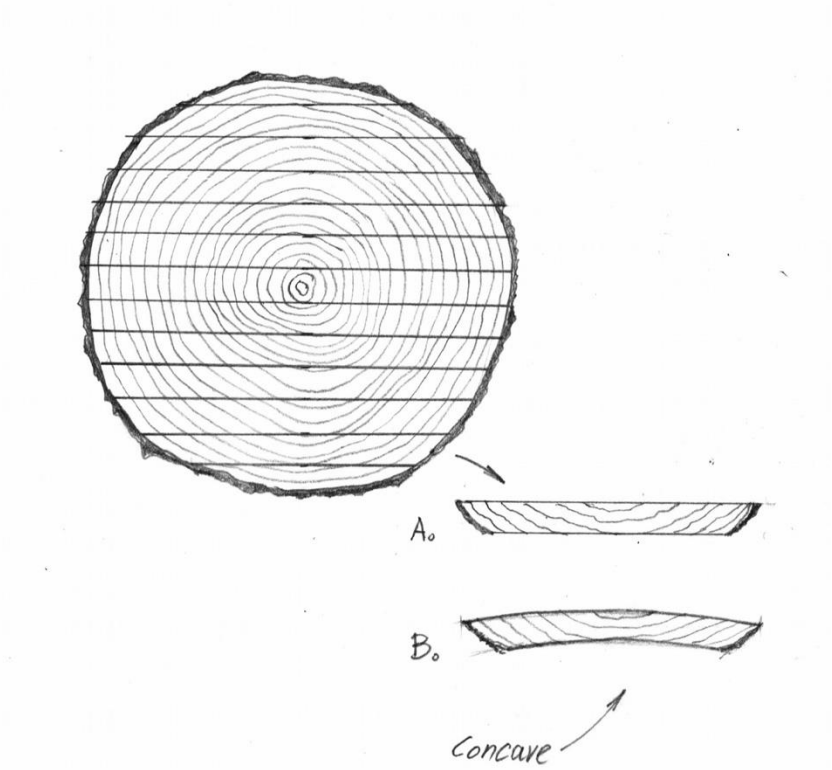






Novel uses for underutilised small diameter coppice – structural reinforcement using traditional green wood craft tools (froe / cleaving axe).


Design reflects specie relationships & local abundance
Mature Oak standards + Small Chestnut coppice understorey





Green timber: ‘cupping’ associated with drying embraced as a design virtue



Stitching of timber components: pre-dates metal fixings

Stitched bench – tensioning ‘T’ tool











Stitched bench components - pre-drilled with drilling jig



Stitched bench components - pre-drilled with drilling jig









Prototype designs scanned (photogrammetry): Digital knowledge sharing







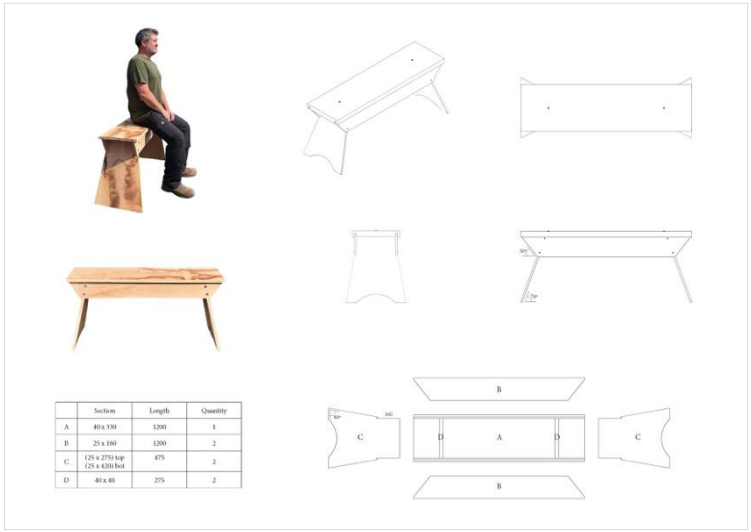




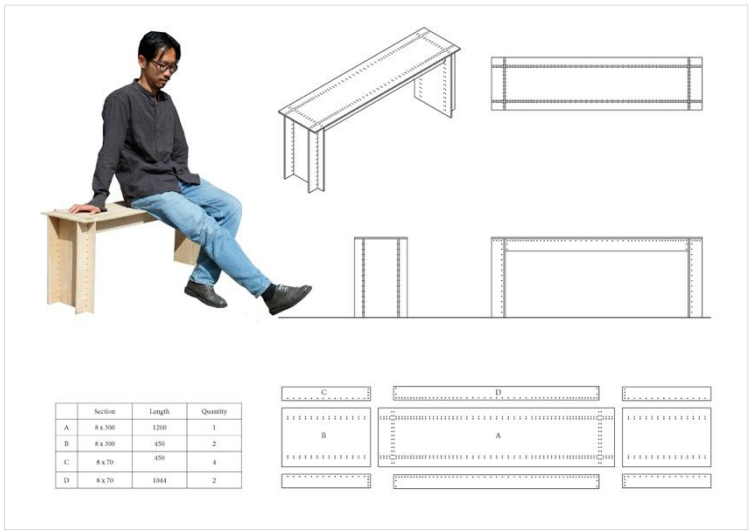
Bench designs

Top: Lightweight stowable benches (school groups)

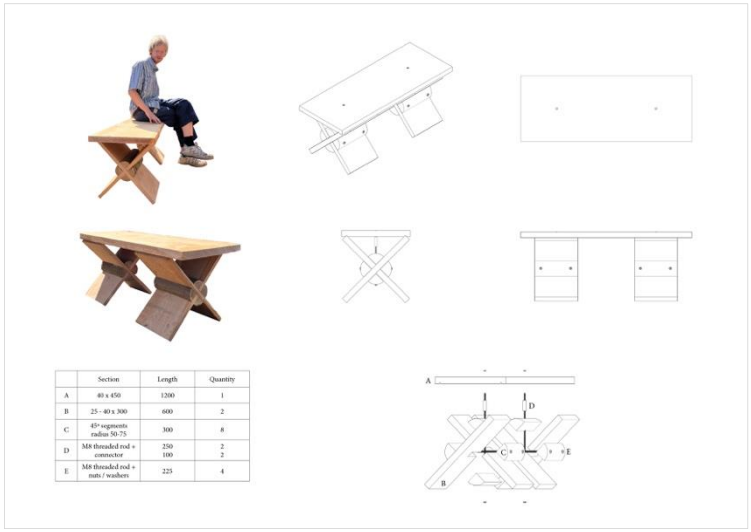
Bottom: Heavy duty / exterior durability (outdoor public use)



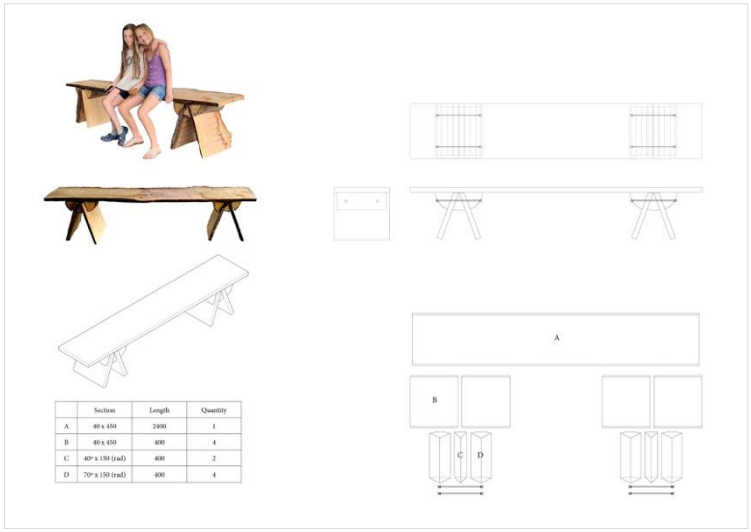
	Section	Length	Quantity
A	40 x 330	1200	1
B	25 x 160	1200	2
C	(25 x 275) top (25 x 420) bot	475	2
D	40 x 40	275	2



	Section	Length	Quantity
A	8 x 300	1200	1
B	8 x 300	450	2
C	8 x 70	450	4
D	8 x 70	1044	2



	Section	Length	Quantity
A	40 x 450	1200	1
B	25 - 40 x 300	600	2
C	45° segments radius 50-75	300	8
D	M8 threaded rod + connector	250 100	2 2
E	M8 threaded rod + nuts / washers	225	4



	Section	Length	Quantity
A	40 x 450	2400	1
B	40 x 450	400	4
C	40* x 150 (rad)	400	2
D	70* x 150 (rad)	400	4

Public domain toolkit: replication of methodology in other underused woodland sites.

Thank you !

Principal investigator: George Fereday, London Metropolitan University
Co-investigator: Dr. Xan Browne, Royal Danish Academy
Site partner: Ian Holt, Lesnes Abbey Woods

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