Climate Action Strategy

Carbon Removals Spotlight

Natural Environment Board

July 2025

Carbon Removals Programme 2024 - 2027

City Corporation green spaces sequester **16,230 tCO$_2$e/year**. The Carbon Removals programme aims to:
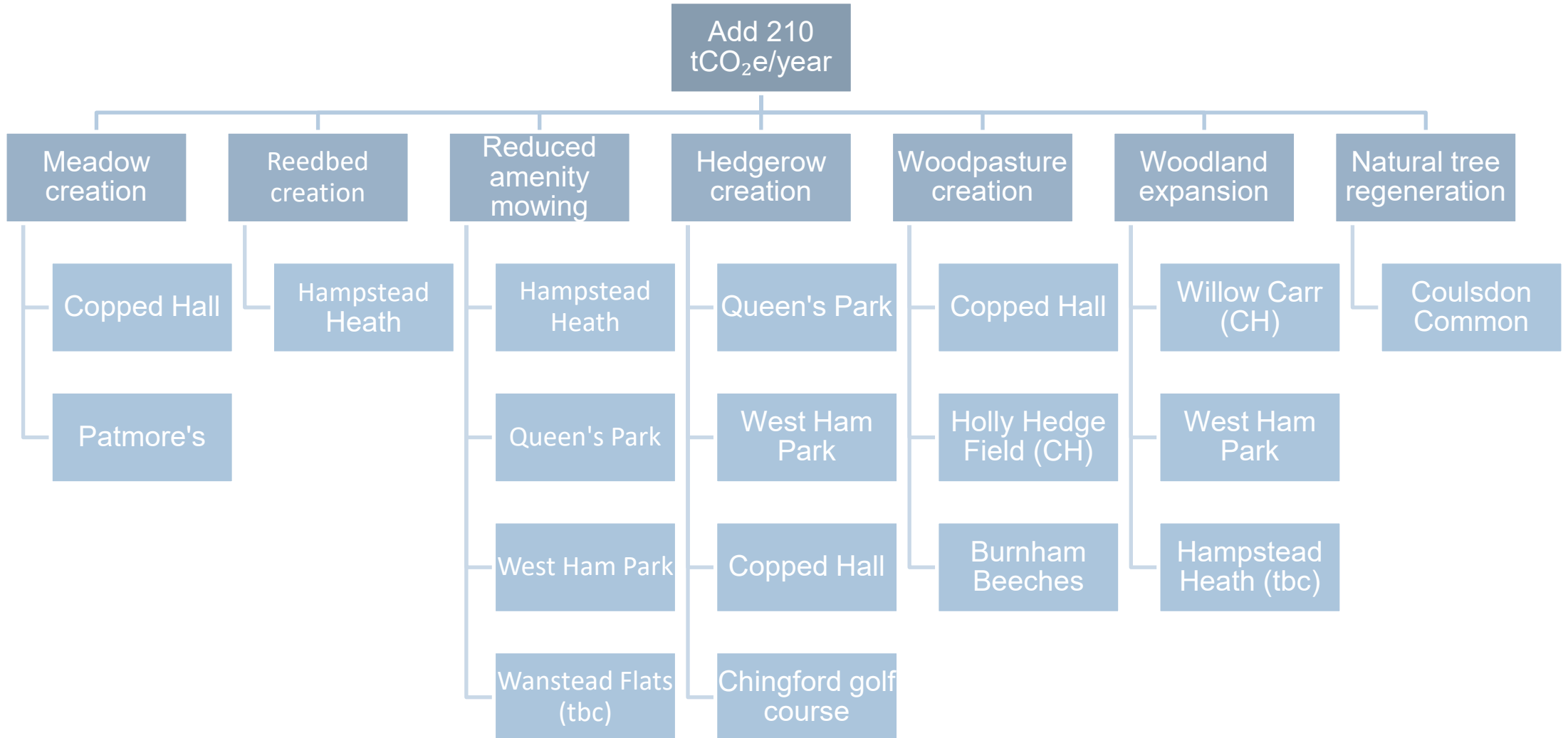
- **protect** existing sequestration from climate change,

- create 210 tCO$_2$e **additional sequestration** by 2027
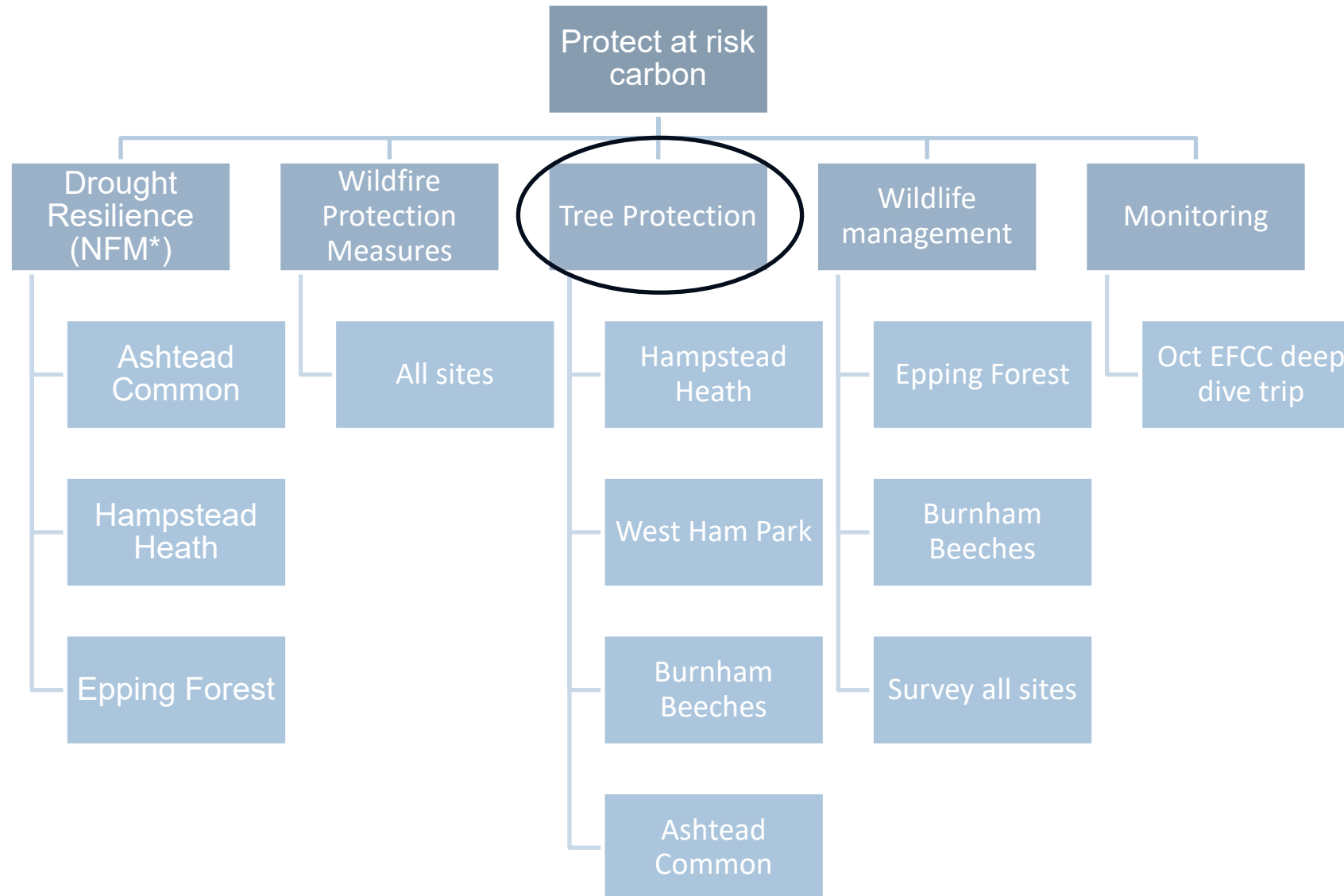
- increase biodiversity

Propped tree: Burnham Beeches

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Carbon Removals: Additionality

Biodiversity

Add 210 tCO$_2$e/year

Meadow creation
- Copped Hall
- Patmore's

Reedbed creation
- Hampstead Heath

Reduced amenity mowing
- Hampstead Heath
- Queen's Park
- West Ham Park
- Wanstead Flats (tbc)

Hedgerow creation
- Queen's Park
- West Ham Park
- Copped Hall
- Chingford golf course

Woodpasture creation
- Copped Hall
- Holly Hedge Field (CH)
- Burnham Beeches

Woodland expansion
- Willow Carr (CH)
- West Ham Park
- Hampstead Heath (tbc)

Natural tree regeneration
- Coulsdon Common

Carbon Removals: Baseline Protection

Biodiversity →

Protect at risk carbon

- **Drought Resilience (NFM*)**
  - Ashtead Common
  - Hampstead Heath
  - Epping Forest
- **Wildfire Protection Measures**
  - All sites
- **Tree Protection** (circled)
  - Hampstead Heath
  - West Ham Park
  - Burnham Beeches
  - Ashtead Common
- **Wildlife management**
  - Epping Forest
  - Burnham Beeches
  - Survey all sites
- **Monitoring**
  - Oct EFCC deep dive trip

*NFM: leaky dams

Tree Protection

The problem

High footfall and a changing climate leads to **soil compaction and poor structure**, severely limiting **microbial biodiversity**. These conditions **restrict oxygen flow, water infiltration, and root penetration**.

Note: Arcadis reported that 10% of CoL's tree sequestration capacity is at risk from climate related impacts.

Tree dieback (soil compaction - lack of water, poor soil health): Hampstead Heath

Tree Protection

The solution

Improving **soil structure and alleviating compaction**, through excluding footfall and aerating soil, are key to fostering healthy **microbe biodiversity** and accumulating **soil organic carbon.**

Looser, well-aerated soils support diverse microbial communities.

Better pore connectivity enhances nutrient cycling and microbial activity.

Reduced compaction allows for deeper root growth and organic matter input.

Soil decompaction: West Ham Park

Tree Protection

The solution: part 2 Boosting Microbial Life

To further enhance microbial diversity, amendments are being added.

- **Compost teas** introduce beneficial microbes.
- **Zeolite** improves nutrient retention and porosity.
- **Biochar** enhances soil structure, water retention, and microbial colonisation, carbon storage and root system development.
- **Woodchip mulch** protects the soil surface, moderates temperature, and slowly releases carbon-rich compounds.

Compost tea application: West Ham Park

Tree Protection

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Mulch application: Hampstead Heath

Tree Protection

Monitoring parameters

- **Carbon**: organic, inorganic, total

- **Nitrogen**: total nitrogen, C:N ratio

- **Bulk density** (for carbon stock and organic matter calculation)

- **pH, available phosphorus, potassium, magnesium**

- **eDNA**: total counts of bacteria, fungi, protozoa, nematodes; fungal:bacterial ratio

- **Soil moisture** at 90cm depth (canopy dripline)

- **Soil compaction** (penetrometer)

- **Tree moisture stress** using TreeSense sensors

Surveying soil compaction: Golders Hill Park

Tree Protection

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Soil core sampling: WHP

Tree Protection

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Tree moisture monitoring: West Ham Park

Tree Protection

The solution- excluding footfall

Movable dead-hedge: Burnham Beeches


Rope fence: Golders Hill Park

Tree Protection

Monitoring

Fungi-to-bacteria ratio in soils inside and outside fenced areas surrounding veteran beech and oak trees at Hampstead Heath (NLOS, May 2025).

Soils outside the fenced areas are subject to greater disturbance from recreational activity, including compaction.

The fungi-to-bacteria (F:B) ratio serves as a useful bioindicator of soil degradation, with higher ratios typically found in undisturbed or mature forest soils.
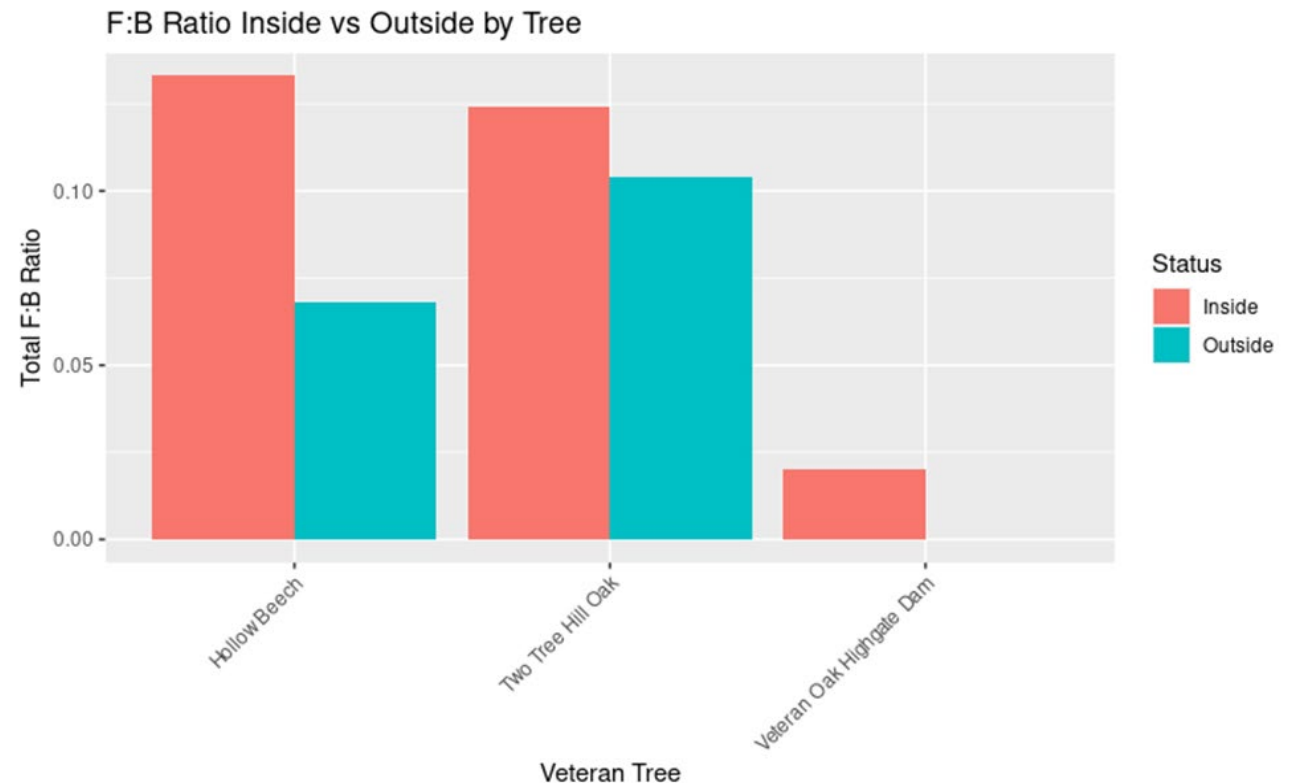
F:B Ratio Inside vs Outside by Tree

Tree Protection

Tree propping

The Druid's Oak, a veteran tree of high ecological, cultural value and carbon protection value, was recently supported with two custom-designed A-frame props.

By physically supporting the tree and preventing premature loss, the intervention:

- **Preserves existing carbon stocks** in both above- and below-ground biomass (~14 tCO2e).
- **Avoids emissions** that would result from decay or removal.
- **Supports continued sequestration**.


Tree propping: Burnham Beeches

Tree Protection

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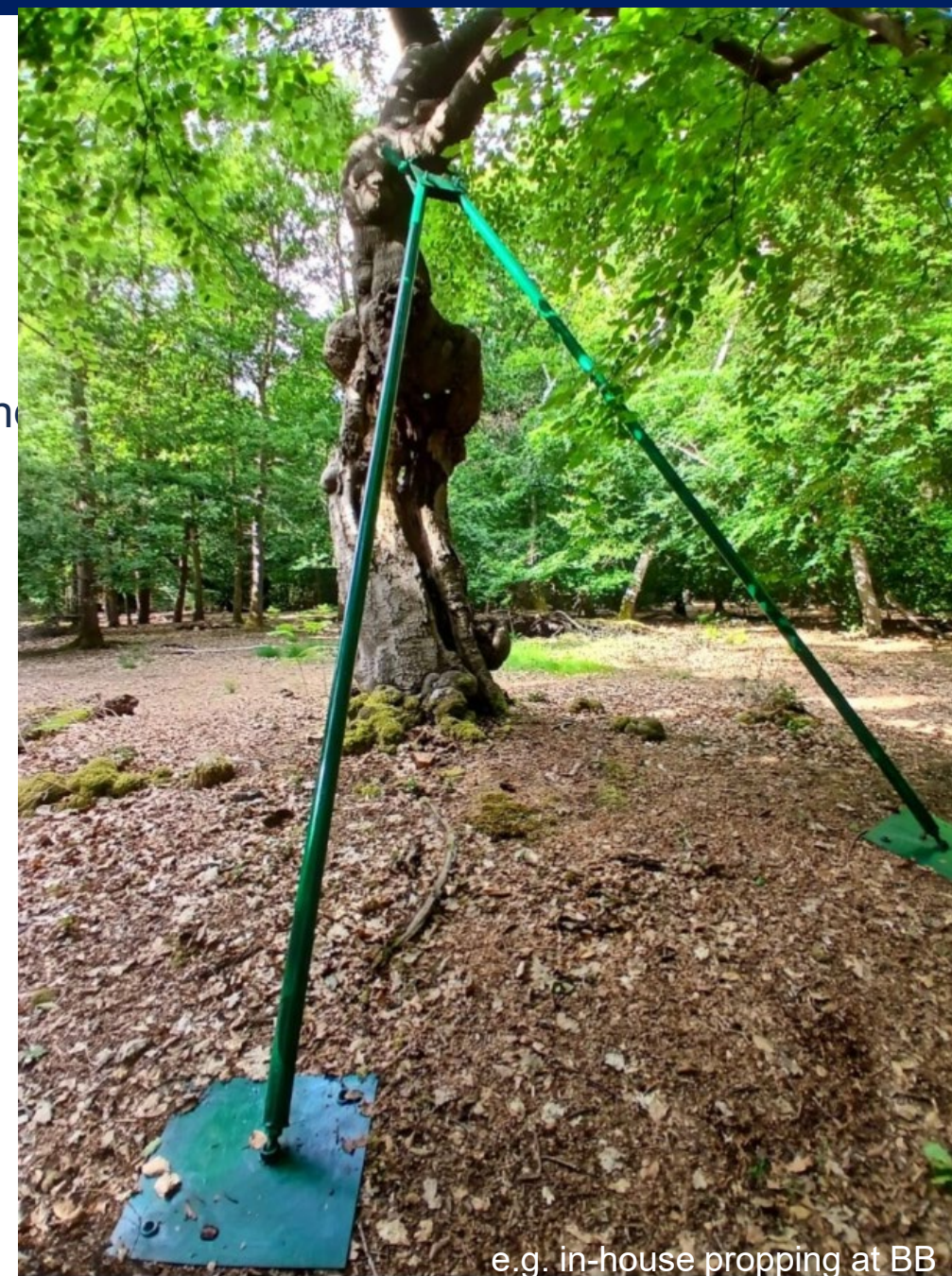
e.g. in-house propping at BB

Tree Protection

Enhancing Tree Management

Evaluate the root and stem stability of trees in extreme weather conditions.

With DynaRoot sensors and software measure the mechanical stability of tree roots.

Tree management teams can make **more informed decisions** about whether a tree requires pruning or not, ultimately aiding in tree survival (and safety) and ensuring the continued sequestration of carbon.
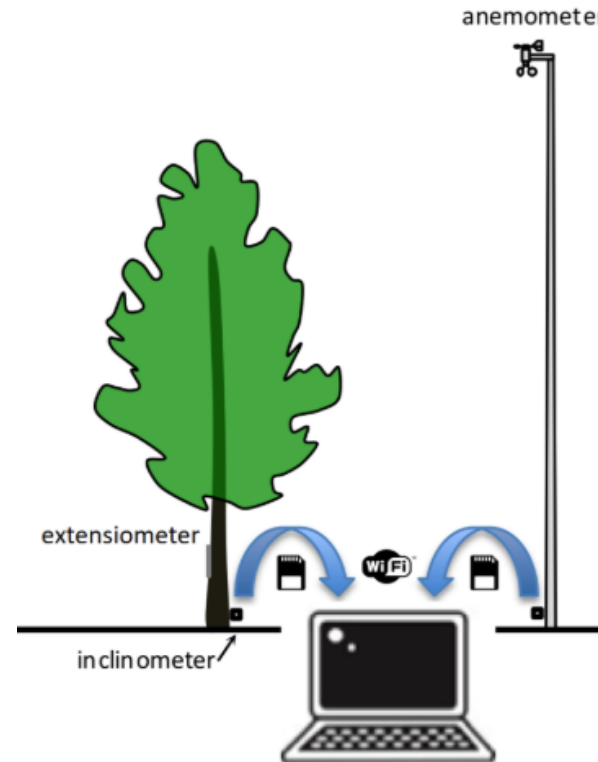
Tree Protection

Future pathway?

- Research collaboration – to inform effective soil and tree management
- Investment post 2027 - to scale up protection interventions

Compacted bare soil: Hollow Beech, Hampstead Heath

Biodiversity

Questions?

Below ground alone can sequester 3.3 - 4.8 $tCO_2e/ha/yr$* if managed sustainably.

Compacted bare soil: Hollow Beech, Hampstead Heath

* Knepp Estate study 2025