Factsheet 2.1

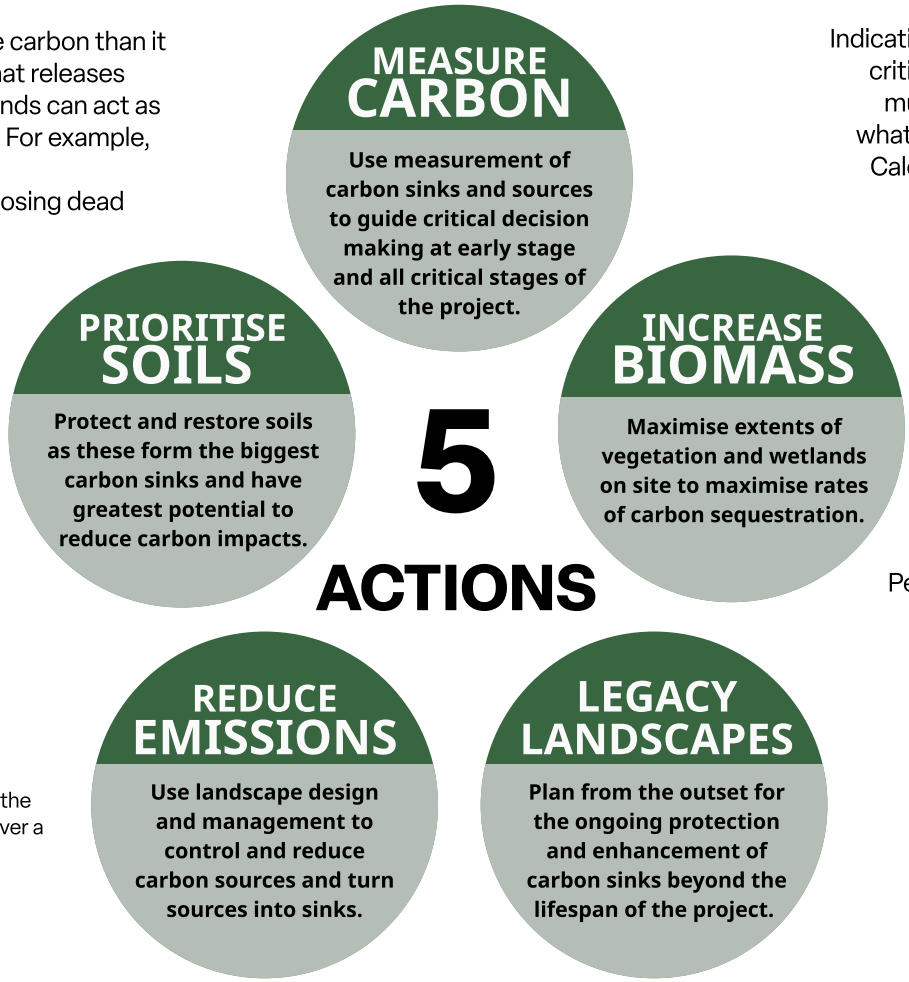
PROTECT CARBON STORES

Landscape Institute

The simplest and most effective way to reduce carbon impacts is to protect, restore and increase the existing carbon sinks in our soils, woodlands, scrublands, grasslands and wetlands.

Carbon Sinks

A carbon sink is any reserve of carbon that absorbs more carbon than it releases, and a carbon source is any reserve of carbon that releases more carbon than it absorbs. Soils, woodlands and wetlands can act as sinks or sources depending on their stage and condition. For example, soils can be carbon sinks if they are absorbing carbon from the atmosphere and decomposing dead organic matter, and carbon sources if the soils become exposed to the atmosphere and release more carbon than they absorb. The aim on any project is to protect and expand carbon sinks and manage and reduce carbon sources.



0 Strategic Definition

1 Preparation and Briefing

Undertake early survey and analysis to understand the extent and condition of carbon sinks and sources on site. Use carbon calculations to understand the potential impacts of the project and how these can be mitigated.

2 Concept Design

3 Spatial Coordination **4 Technical Design**

Use detailed survey and analysis of carbon sinks and stores to inform the development of the design. Use carbon calculations to guide and deliver a design that protects and restores carbon sinks.

5 Construction **6 Handover**

Minimise impacts on carbon sinks during construction through ensuring effective protection is in place.

7 Use

Inbuild adaptability so the design can continue to protect and expand carbon sinks during the operational stage.

8 End-of-life

Inbuild provisions for carbon sinks to be protected and retained at the end of the project as part of a longer term landscape legacy.

Measuring Carbon Stocks

Indicative measurements relating to on-site carbon stocks are critical in reducing carbon impacts - you need to know how much carbon is stored in the soils and vegetation to know what needs to be protected and what needs to be restored. Calculations are indicative owing to the limited accuracy of carbon values relating to soils and vegetation. They require measurements of the different soil and habitat types across the site multiplied by the carbon density values attributed to these types.

Pathfinder and Elemental are quick and easy to use tools that enable the calculation of baseline carbon stores for specific sites. The Landscape Carbon Tracker tool is useful for larger scale, strategic planning and target setting, while the carbon calculators for the UK Woodland and Peatland Codes calculate baseline carbon stores relative to these components.

Carbon stocks can also be measured independently from standardised tools by multiplying areas with the appropriate values.

Links to information on carbon:

Carbon Storage and Sequestration by Habitat 2021 - NERR094
Living England 2022-2023 | Natural England Open Data Geoportal
The Carbon Cycle
Carbon Sources and Sinks

Carbon Data and Tools for measuring carbon sinks:

Climate Positive Design | Pathfinder
Elemental
Carbon Conscious App
NatureInsight
UK Woodland Carbon Codes
Peatland Codes

PROTECT CARBON STORES

Soils as Carbon Sinks

Soils contain 80% of terrestrial carbon; this is almost three times as much carbon as in the atmosphere. Prioritising soils can be achieved through following these measures.

- Keep soils covered and undisturbed so that the carbon stays locked into the soil - this may mean working with existing levels and existing vegetation or minimising earthworks and vegetation clearance where possible.
- Use soil survey information and soil testing to determine which areas should be protected from development and which should be protected by being kept covered with permanent vegetation.
- Use Special Protection Zones (SPZ) to protect soils from construction processes, especially compaction from heavy machinery.
- Develop Soil Strategies to ensure soil is excavated and stored in line with best practice guidance and reused on site rather than taken to landfill.

Vegetation as Carbon Sinks

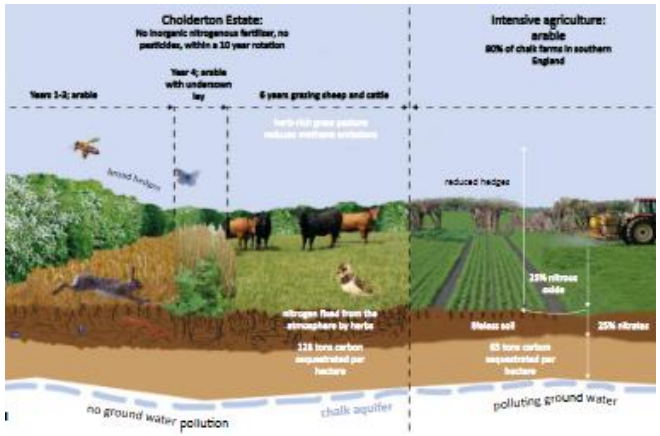
In order to maximise the absorption of carbon, it is important that vegetation is given space to grow big over a long time.

- Use a mix of native tree species, with fast growing trees delivering high absorption rates over a shorter lifespan and slower growing trees delivering medium absorption rates over a longer lifespan.
- Maximise growth by matching species with soils, aspect, slope and microclimate, selecting native species of local providence, ensuring a mix of species and ages, factoring in climate and disease resilience and creating symbiotic plant communities.
- While trees are most effective for carbon absorption, all plant material helps, with greater habitat diversity boosting overall biodiversity.

Wetlands as Carbon Sinks

Wetlands are areas that are either permanently or seasonally flooded or saturated by water. Under the water and sediment, they lock away large volumes of carbon drawn from dead organic matter and animal waste. Wetlands can store 50 times more carbon than rain forests.

The UK has lost 90% of its wetlands over the past 100 years. Following the mitigation hierarchy, development of wetlands must be avoided, and efforts made to protect, restore and expand all our wetlands. There is also the potential to reclaim wetlands lost to other land uses and create new wetlands in flat and low-lying areas where conditions are right. New wetland areas are often well-suited in areas prone to flooding as they can also help to alleviate flood risks.



Links to information on soils:

British Society of Soil Science information;
LandIS - Land Information System - Cranfield Environment Centre
Soils in Planning and Construction Task Force
DEFRA Sustainable Use of Soils on Construction Sites
Digging Deep: Soil, life and landscape by Landscape, the journal of the Landscape Institute - Issuu

Links to information on vegetation / wetlands:

Carbon Storage and Sequestration by Habitat 2021 - NERR094
Landscape Design for Carbon Sequestration | ASLA 2020 Student Awards
Wetlands | The Wildlife Trusts