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What is a Root Protection Area and what does it mean?

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A root protection area is usually an arbitrarily calculated area which is intended to avoid damage to the tree's root system immediately under and just beyond the crown.

It is most commonly associated with planning applications but is also applicable in agricultural and forestry situations.

Root Protection Area is defined as a layout design tool indicating the minimum area around a tree deemed to contain sufficient roots and rooting volume to maintain the tree's viability, and where the protection of the roots and soil structure is treated as a priority.

Planning applications and trees

In the UK, all trees are a material consideration in planning. Local planning authorities need to understand the impacts of a proposed development on any trees present.

A British Standard has been developed for use in providing information to local planning authorities.

“British Standard 5837: Trees in relation to design, demolition and construction – recommendations”.

British Standards can be purchased or may be available to see in local planning authority offices.

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Tree roots can extend more than twice as far as the crown radius.

Credit: Jane Corey / WTML

How is a root protection area calculated?

The British Standard 5837, RPA is calculated by multiplying the diameter of the tree at breast height in metres by 12, but is capped as an area with a radius of 15m.

How far do roots spread?

Little research has been done into the extent of root systems, but it's clear they extend well beyond the crown drip line (Perry, 1982). It may be as much as seven times the crown area or 2.5 times the crown radius.

Tree roots are primarily in the top 30cms because further down in the soil, oxygen becomes more limiting and roots need to respire. Unfortunately, the area does not usually take into account the extent of the mycorrhizal (fungus-root) fungi directly associated with the fine roots.

Mycorrhizae

Beyond the end of the root system the tree uses a complex network of fungi to gather more nutrients. Mycorrhizal fungi attach to the roots of the tree. In return for the nutrients from the fungi, the tree gives sugars to the fungi.

Sometimes the fungi can be seen as the fruit bodies which appear beyond any calculated root area extent. Even then the extent of the mycorrhizal fungi is not clear, as fruit bodies are produced some way back from the front of the hyphal system.

Trees put enormous demands on their underground support systems. Roots and their associated mycorrhizal fungi supply nutrients and water to the tree. During transpiration, trees need many litres of water on a daily basis – as much as 220 litres for an oak tree in summer.

Bigger root protection areas are needed

Along with the [Ancient Tree Forum](#), we have always proposed an area greater than the existing RPA for very special ancient and veteran trees. For very important trees this would be calculated as an area with a radius which is 15 times the diameter of the tree at breast height which is not capped, or 2 metres beyond the crown whichever is the greater.

More recently, there has been a discussion of using non-invasive root radar and root tomography to establish the extent and condition of ancient tree roots so as to be sure the RPA is minimising the impacts to these trees in particular.

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