

2011 Annual Meeting of the Farm Woodland Forum @ Wakelyns Agroforestry



***Eco-functional intensification
of orchards: forest gardens
and the permaculture design
approach***

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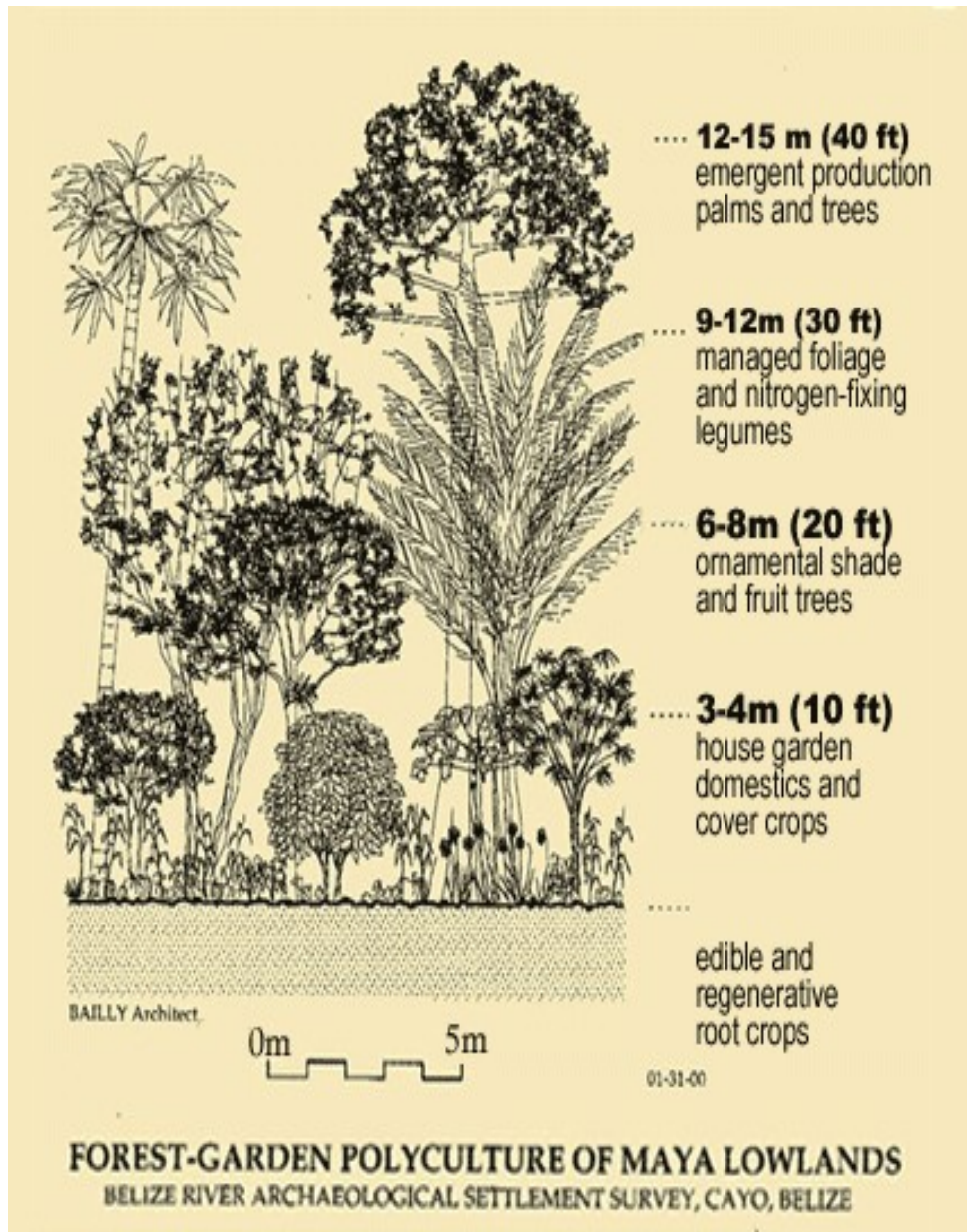
Permaculture Association



change your world
with permaculture

- Education and research charity.
- Membership scheme
- LAND project
- Research Advisory Board
- Diploma in Applied Permaculture Design
- International hub
- New networks in Scotland and Wales
- Information, advice, website

Permaculture – ecological design

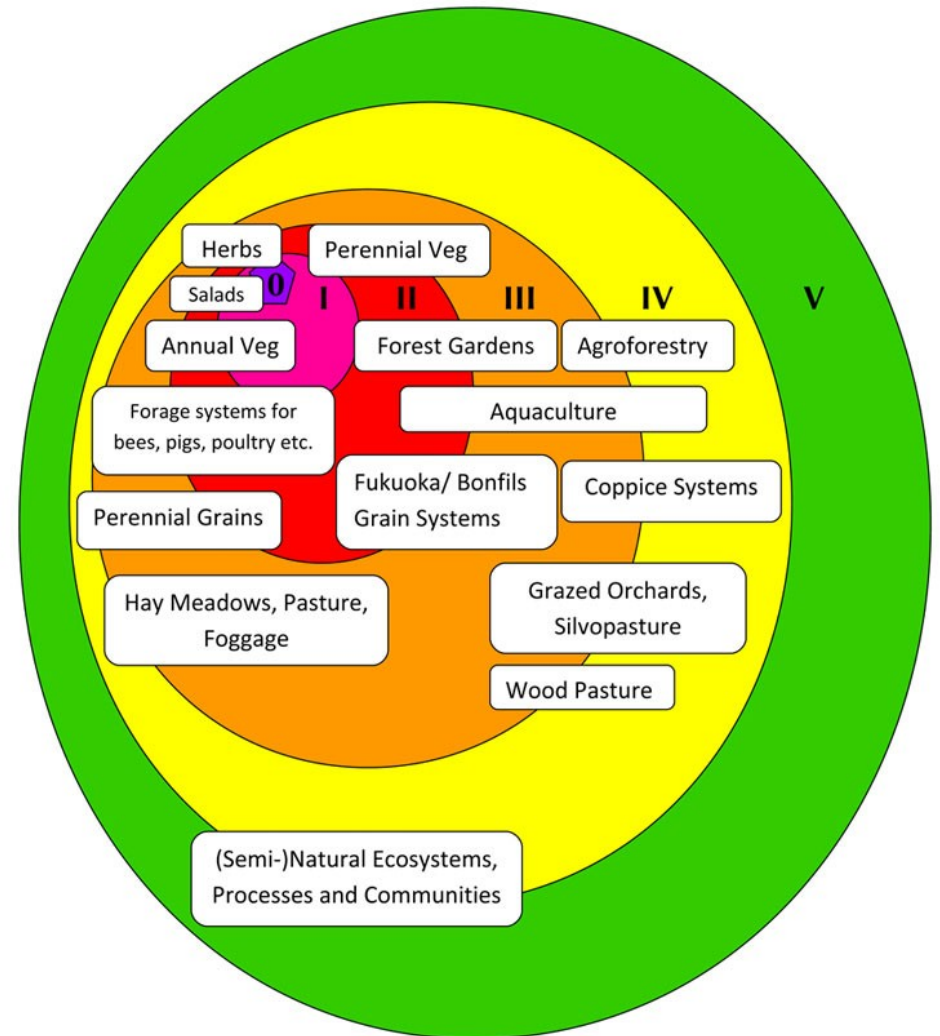


- From **Permanent-agriculture**
- Mollison and Holmgren influenced by ecologists, especially Howard Odum.
- Draws on traditional practices and modern science & technology.
- A design approach to creating agriculturally productive sustainable settlements.
- Permaculture seeks to make “eco-thinking” accessible to widest audience.

Settlement as farm

- Permaculture seeks to design highly productive “edible landscapes.”
- Self-reliance and productivity starts at the back door (and on the roof!).
- Uses a system of 'zoning' to pattern different forms of production.
- Most intensive management within and near the home/settlement.
- Trees have a role in every zone.
- Forest gardens are a zone 2 element.
- Re-imagine farms as sophisticated polycultures within wild(er) wooded landscape
- We favour perennial polycultures.

Polyculture practices & zones



HO SUOI RAU (lake) * Irrigation Source * Header Tank Pump	REPLACEMENT SERIES * Row Mounding	SWALE/ ACCESS	REPLACEMENT SERIES * Row Mounding	HEADER TANK *10-20KL * Gravity Irrigation Water Storage	REPLACEMENT SERIES * Terraced Rows	SWALE/ ACCESS	REPLACEMENT SERIES * Row Mounding	LINEAR POND * Deep Water Storage (sump pond)	ROAD FRONTAGE * Sticky-leaved shrub hedge * Large Trees to mark boundary	REPLACEMENT SERIES * Row Mounding
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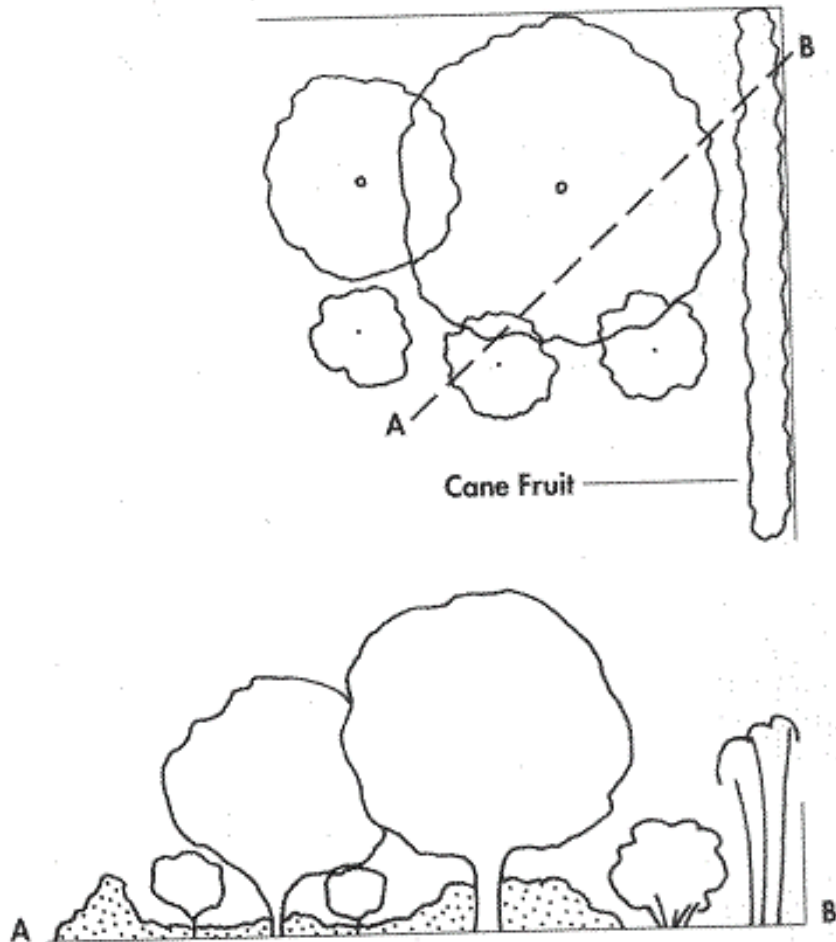
- Principles guide overall thinking.
- Combine ecological insights, systems thinking, and design directives.
- Ecosystem structure and process as template for cultivated ecosystems.
- Design process seeks to maximise beneficial relationships between elements.
- The design emphasis is on creating an ecosystem with maximum water, soil and plant resources.
- Species are chosen for range of functions.
- Observation helps shape appropriate system evolution.

Forest garden: description



“A forest garden is a designed agronomic system based on trees, shrubs and perennial plants. These are mixed in such a way as to mimic the structure of a natural forest - the most stable and sustainable type of ecosystem in a temperate climate.” Martin Crawford

Forest gardens: background



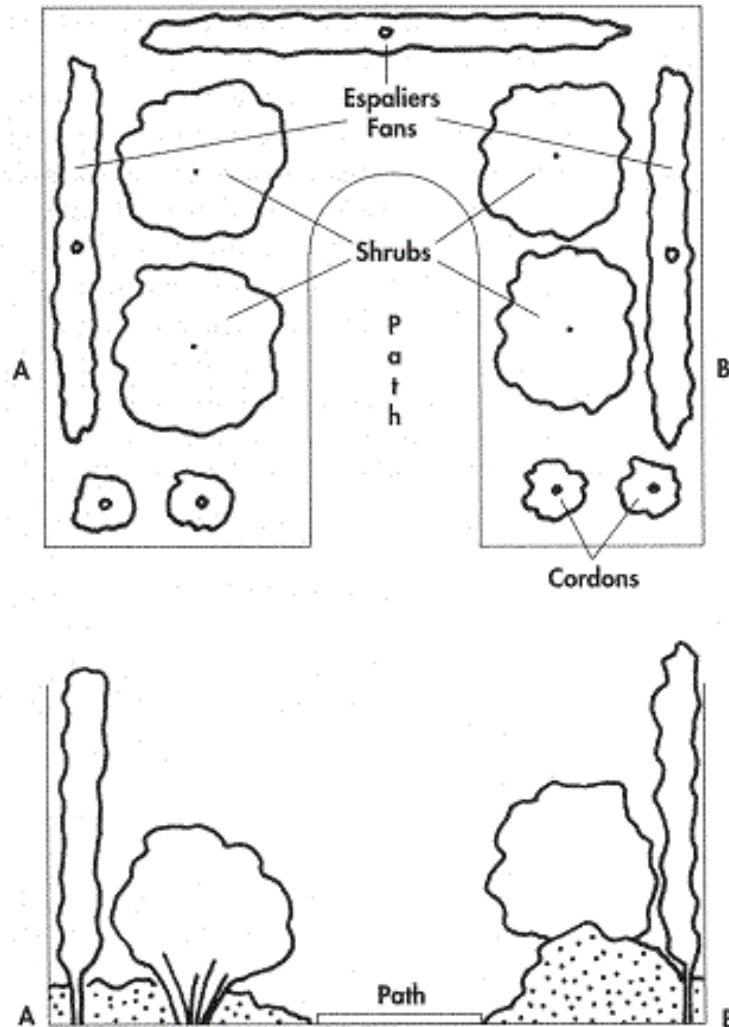
- Long tradition in the tropics.
- In cool temperate, more recent, with Robert Hart as pioneer.
- Martin Crawford (ART) is now the leading UK innovator.
- Focus is usually on home production rather than commercial.
- However practice can inform commercial scale.
- Forest Gardens starting to be used in commercial settings.

Forest garden: aims



- To be biologically sustainable
- To cope with disturbances such as climate change.
- To be productive, yielding many different products.
- To require low maintenance.

Forest garden: physical yields



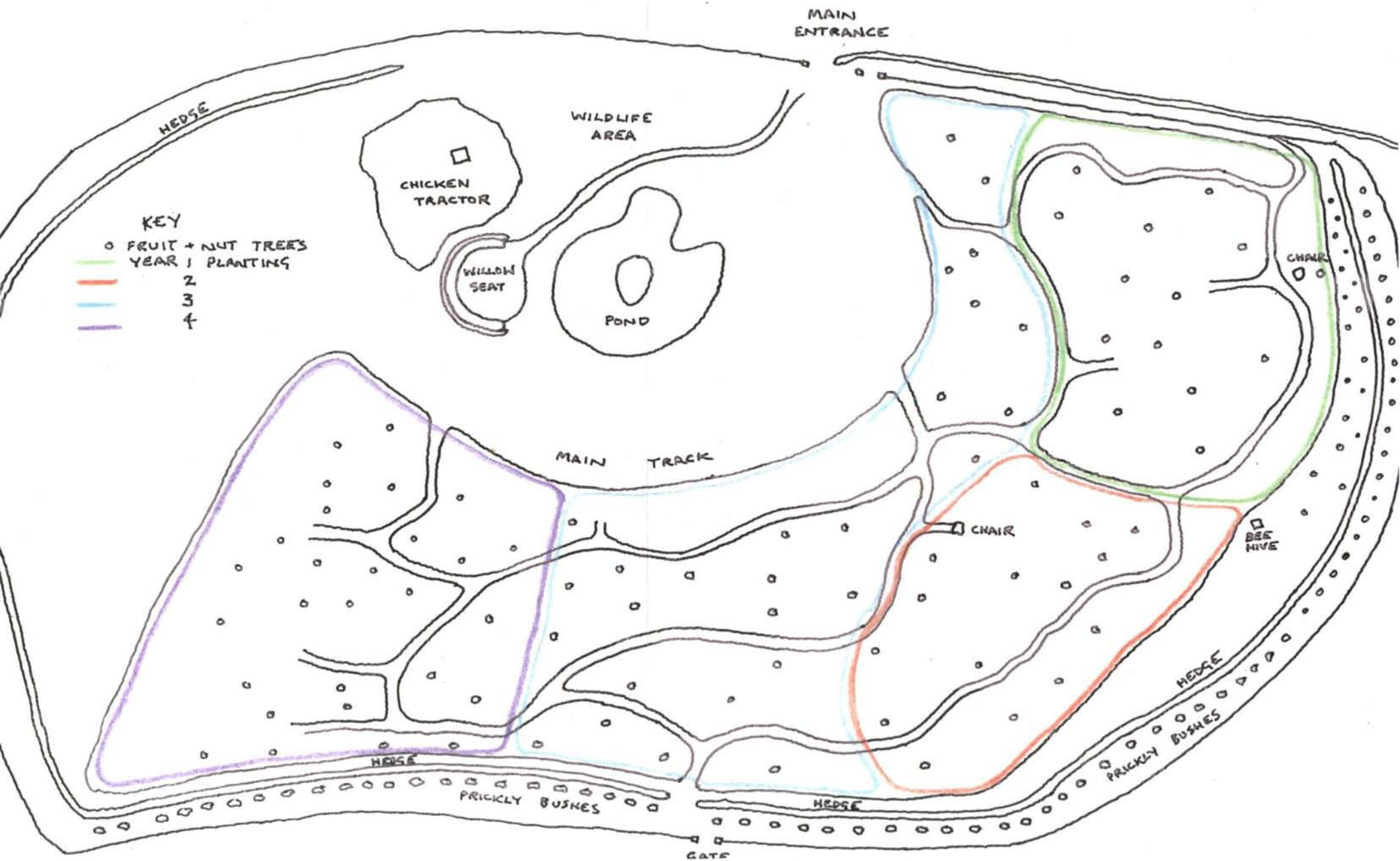
- fruits
- nuts
- edible leaves
- spices
- medicinal plants
- poles
- fibres for tying
- basketry materials
- honey
- fuelwood
- fodder
- mulches
- game
- mushrooms
- sap products

Forest gardens: key features



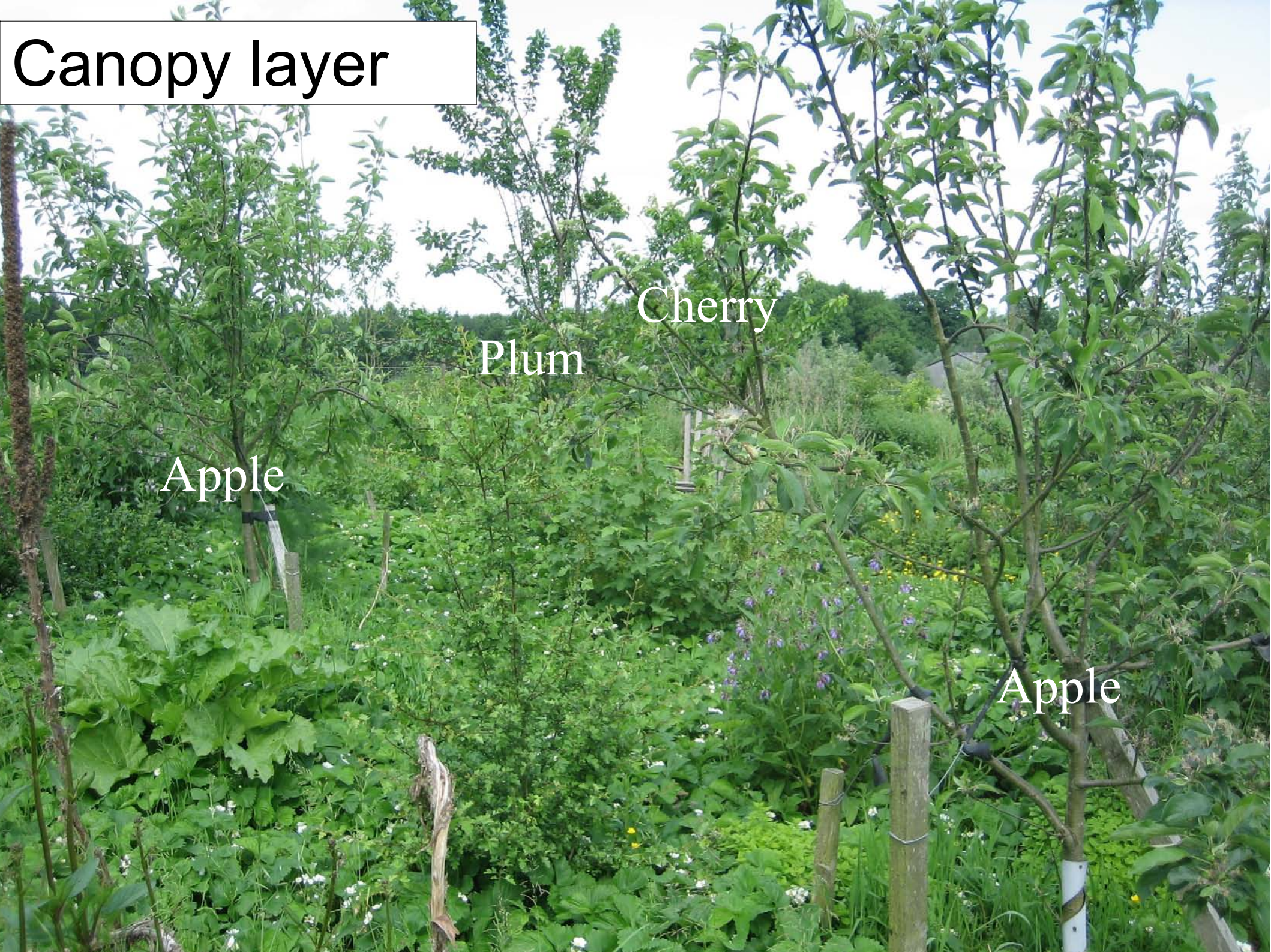
- They mimic a young forest in structure.
- Up to seven layers: root, groundcover, herbs, shrub, small tree, canopy tree, climbers.
- Tree density is optimised.
- Inter-species interactions are maximised.
- Aim for permanently covered soil.
- Plants chosen as crop, mulch, nitrogen fixer, insect attractor, aromatics, dynamic accumulators, etc.
- Fertility is maintained by the plants.
- Forest Gardens tend to be very diverse.
- Design to maximise light penetration is key, edges used for light loving plants.
- Intensity of cropping means that they tend to be between 0.1 and 1 hectare in size.

Example: Old Slenningford Farm





Canopy layer



Apple

Plum

Cherry

Apple

Lower trees

Hawthorn



Shrubs and bushes

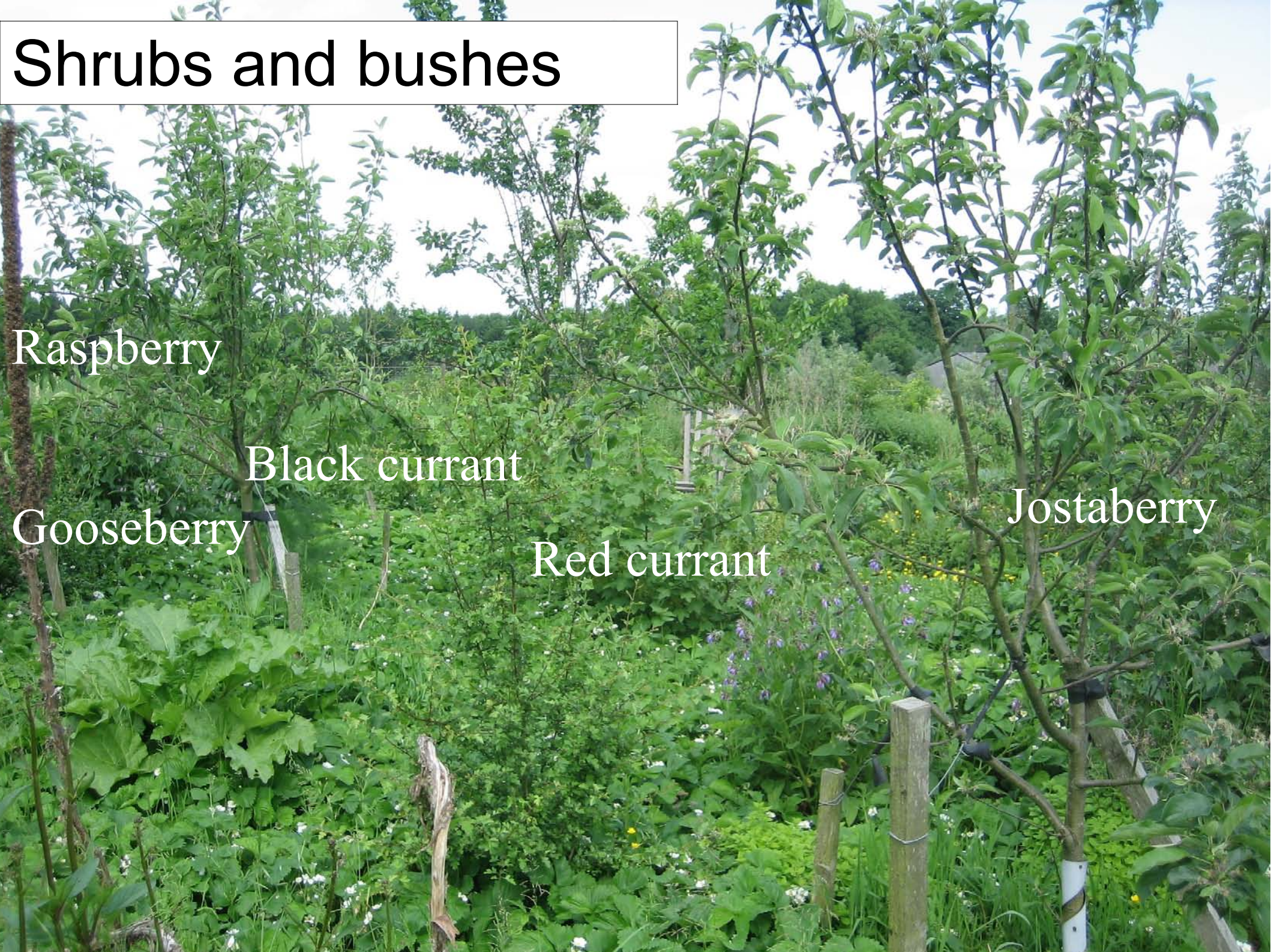
Raspberry

Black currant

Gooseberry

Red currant

Jostaberry



Herbaceous

Great Mullein

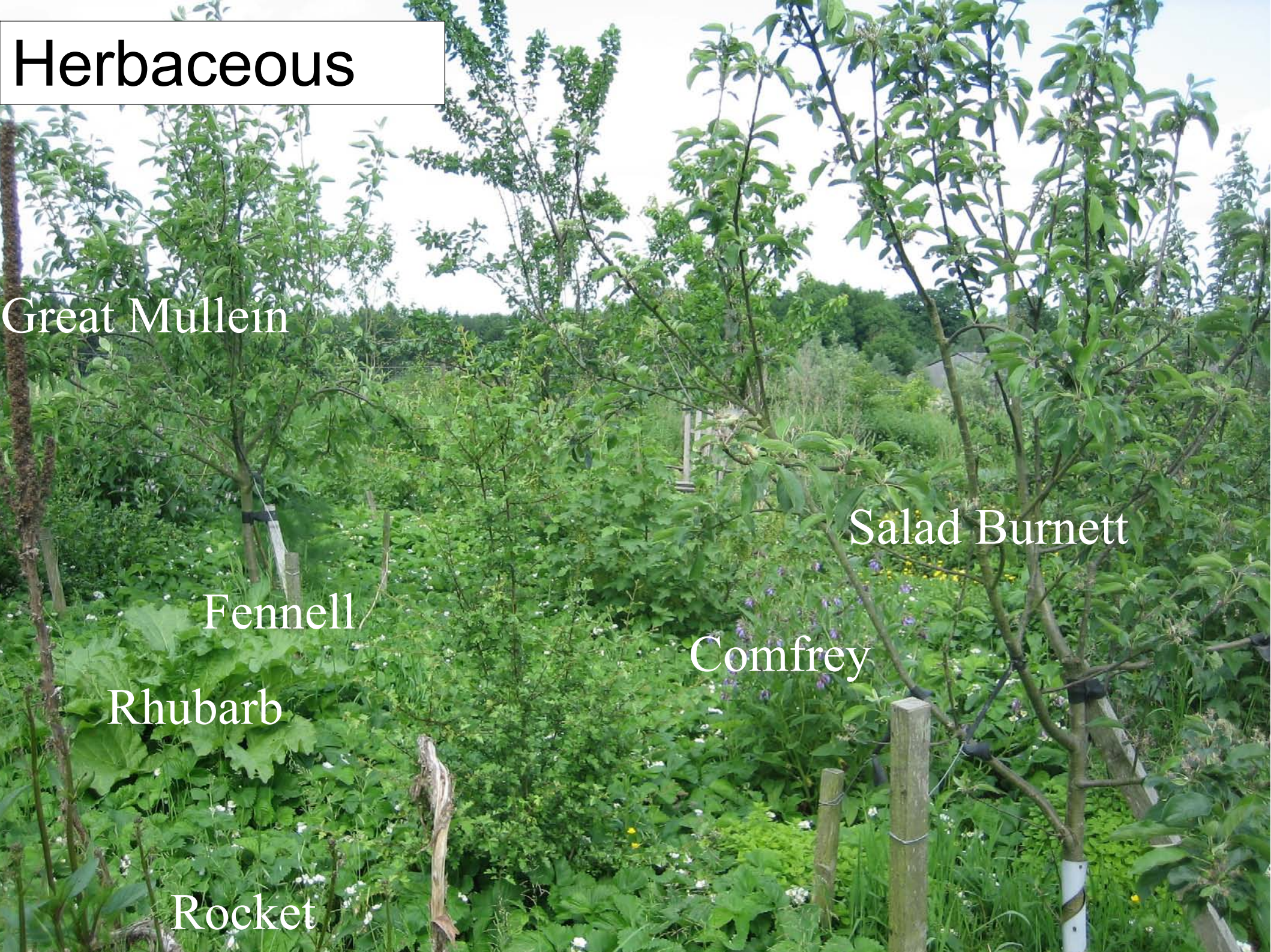
Fennell

Rhubarb

Rocket

Comfrey

Salad Burnett



Climbers

Nasturtium



Soil Surface

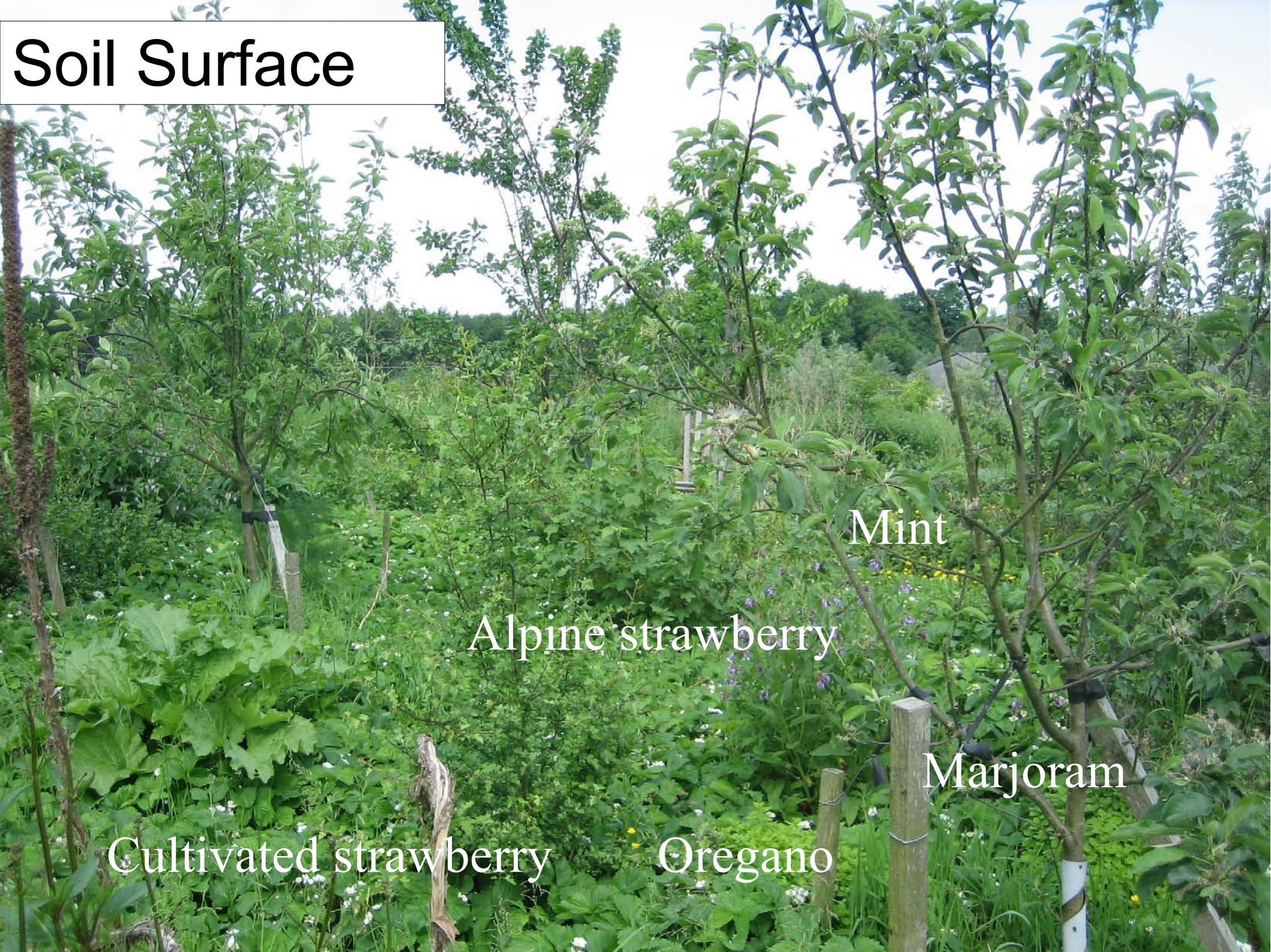
Mint

Alpine strawberry

Marjoram

Cultivated strawberry

Oregano



Bulbs and tubers

Jerusalem Artichoke

Wild Garlic





10m x 5m

24 varieties

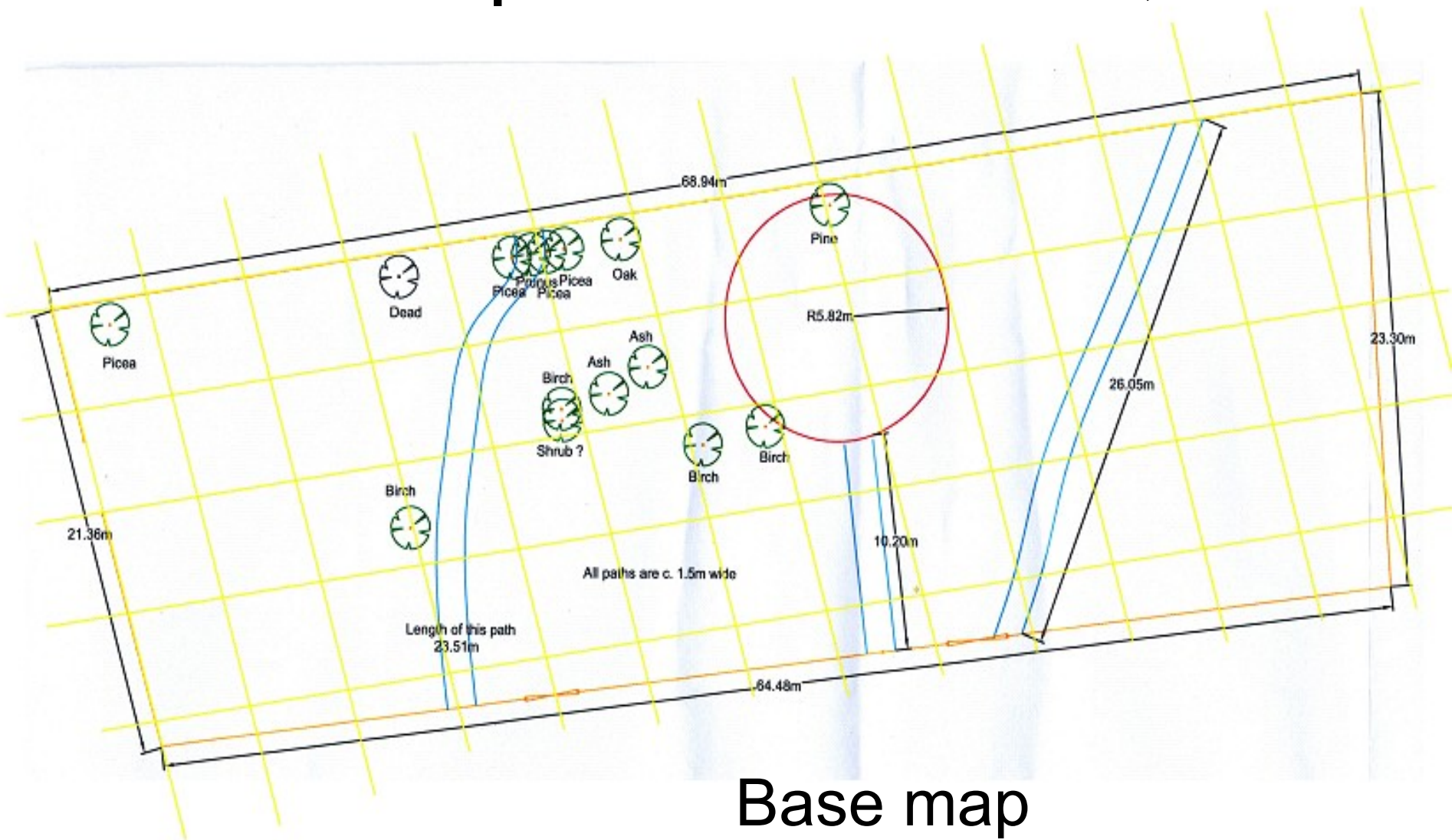


Small example: my back garden

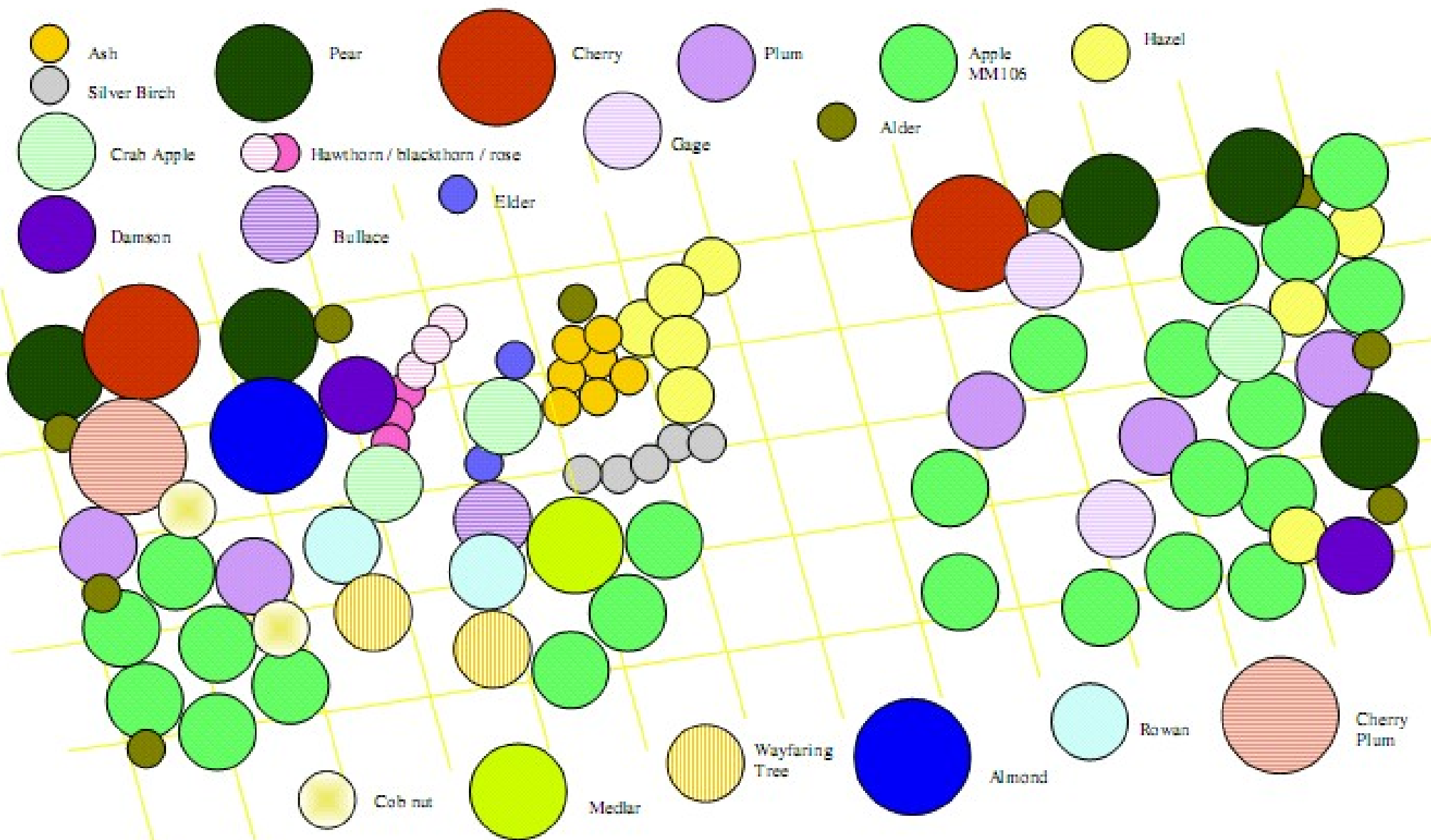


- Tiny backyard (6x8m)
- Plum and apple trees
- Redcurrants and jostaberries
- Perennial kale, lovage
- Sorrels, mints, lemon balm, salad burnett
- Asparagus
- Strawberries and sorrels, nepalese berries
- Thornless blackberries

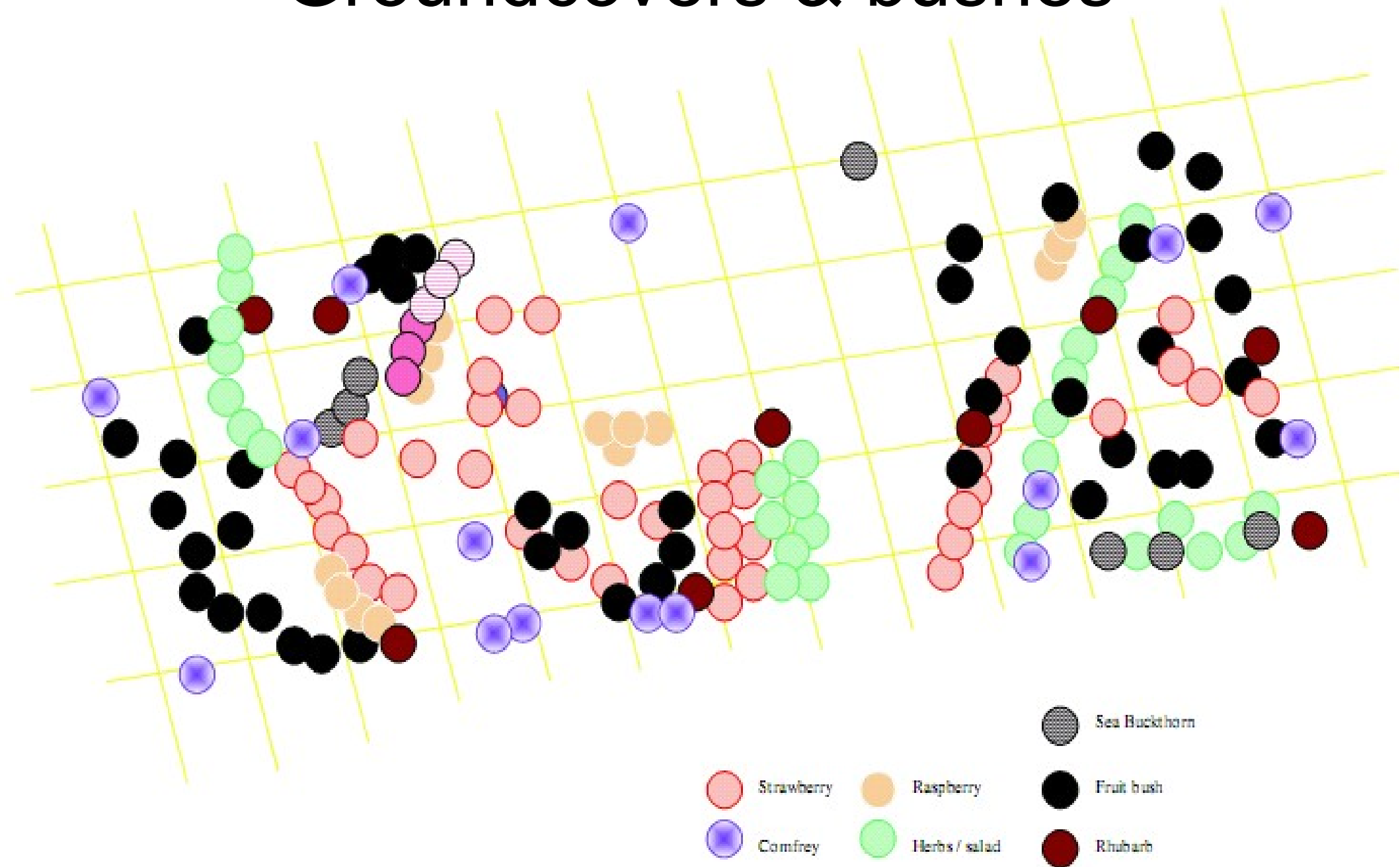
New example: Harlow Carr, RHS



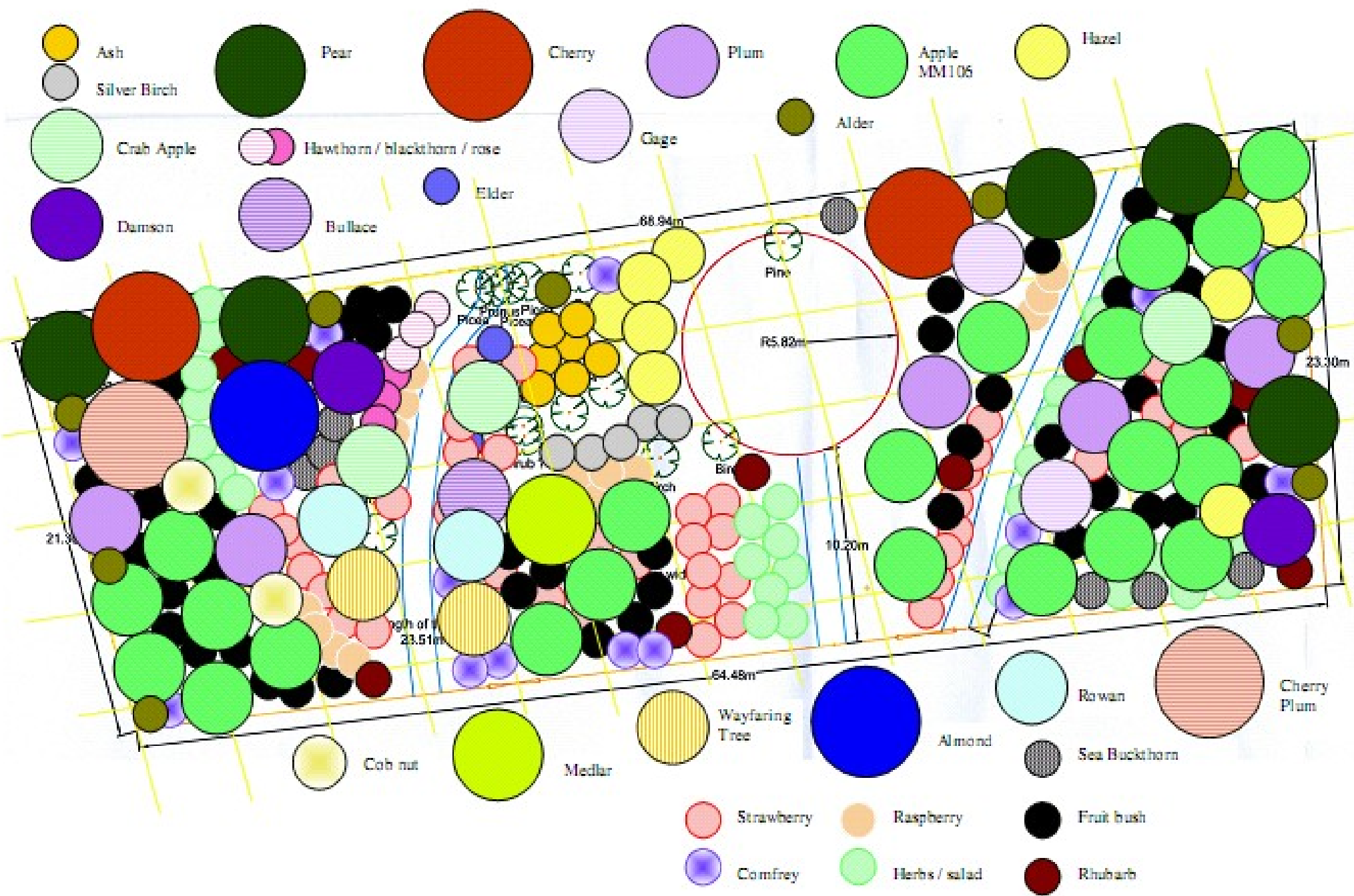
Tree plan



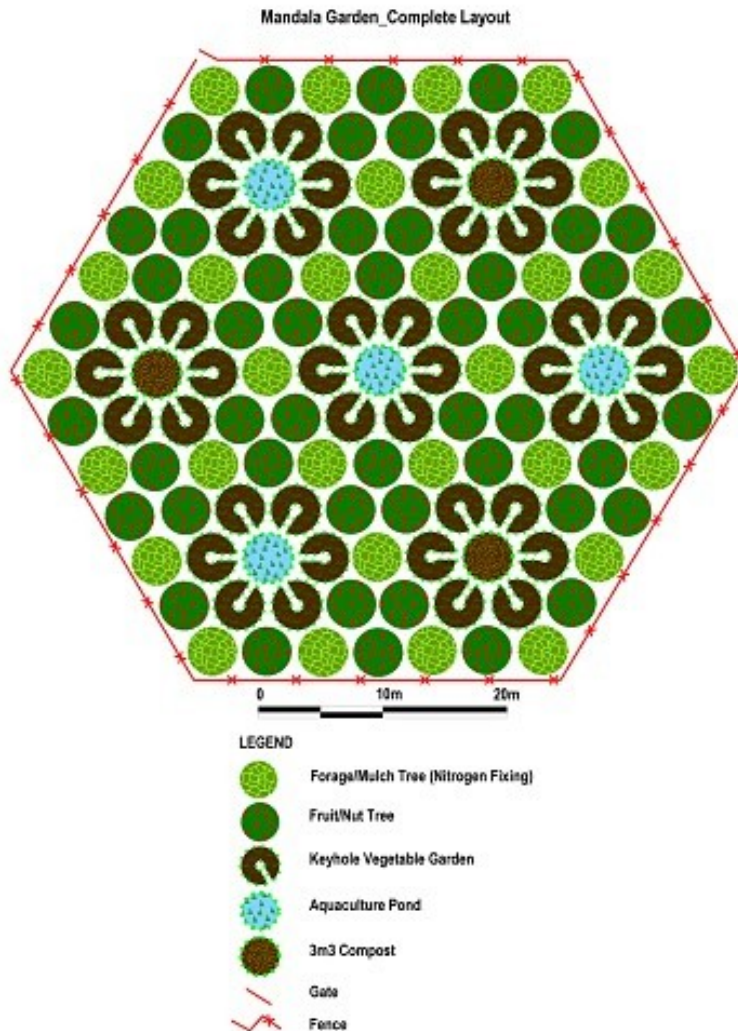
Groundcovers & bushes



Final design



Forest garden: trials



Modified Layout from 'The Permaculture Home Garden', Linda Woodrow, 1996, Penguin Books, Australia

- Started in the winter of 2010/11. Topsy turvy!
- Process uncovered 70 forest gardens planned for 2011 – approx. 3-400 in UK in total?
- 12 trial plots all planted in same season (to some extent)
- Collected baseline data (soil, wildlife, site survey, planting plan/species list, budget.)
- Will record yields in years 3,5 and 10
- Developing a working group and research qs!
- Analysed perceived benefits – over 30 given
- Aim to understand roles and yields of forest gardens, and test the benefits.
- Yield is understood in its widest sense: physical harvest, biodiversity, social and educational, etc
- Looking for research links and partners to extend the work. We need your expertise!
- Resources (books, links, courses) at:
www.permaculture.org.uk/forestgardens

Thanks and any questions?



- If you want to discuss forest gardens, our research trials or practical steps after the conference, please contact me via:
- andyg@permaculture.org.uk

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