Notes for Lonesome Pine Ride – 8th April 2017

Conifer Basics

Conifers are Gymnosperms – A class of primitive plants where the ovule (seed) is naked on a bract rather than being enclosed within an ovary (e.g. seed head or pod). The male pollen interacts directly with the female ovule rather than sprouting a tube which enters the ovary of angiosperms. The "internal plumbing" of the wood is also different to most deciduous (angiosperm) trees.

Gymnosperms trees are conifers, taxads (yews) and Ginkos. ~550 species in 50 genera

Conifers arose about 300 million years ago (late carboniferous) and were the dominant kind of tree until about 50 million years ago (Cretaceous)

Angiosperms (most other deciduous trees) arose ~ 100 million years ago and eventually dominated the tree flora.

Current day conifers are a pale **remnant** of what once was.

Conifers produce seeds attached to the cone bract (2 per bract). Most conifers have separate male and female structure on the same tree. The female "flowers" go on to form the cone. A few (e.g. Monkey Puzzle) can have trees with only male or only female "flowers".

Cones mature on the tree. Most cones take 1 year to mature, but a few take up to 3 years. When mature, a cone will open and close depending on humidity to ensure that the seeds get released in favourable dry conditions when they are more likely to be dispersed a good distance by the wind. Hence cones were used by people to predict the weather. In some species (pines, spruces, larches, redwoods for example) the cone drops off the tree intact once the seeds have dispersed. In others (notably firs and cedars) the cones disintegrate on the tree, so whole cones are hard to come by.

Conifers are often referred to as "softwoods". It is true that some of them do really have softwood (Redwoods) but many are the source of commercially important timbers and are anything but "soft"!

Types of conifer we are going to see today:
Pines (pinus), Firs (Abies), Spruces (picea), Cedars (cedrus), Larches (Larix), Redwoods (sequoia) plus a few oddities!

Trees we are visiting on our ride:

1. Cedar of Lebanon (Linacre College)
    - Native to Turkey, Syria and Lebanon

- A slow growing tree popular both for ornament and for wood from ancient times (used to build King Solomon's Temple!)
- Wood is so slow growing that it is no longer used for building as it's too expensive a commodity (was overexploited), instead it is used to produce attractive veneers.
- Wood known as "cedar" can actually come from any one of about 13 species from 9 different genera none of which are true cedars and from all over the world; America, Asian and Australia! Confused???
- Like all cedars needles emerge from a small side shoot and bear cones upright
- The branches grow in a very distinctive way in horizontal plates, like the layers in a wedding cake

2. Dawn Redwood (Mesopotamia)
    - Discovered in 1944 in SW China
    - Before that it was only known from fossils!
    - Fossils known from the late Cretaceous period (~70 Million years ago)
    - Deciduous – foliage turns a wonderful brick red in autumn
    - Later in the Miocene (23-5 million years ago) there were huge forests in the north. It is believed that it evolved from a non-deciduous ancestor and that the deciduous habit helped it dominate northern forests where it was light 24 hrs per day for 3 months and also dark for 24 hrs per day for three months of the year
    - Introduced into UK in 1948, so most trees we will see today are 60-70 years old
    - Closely related to sequoias (hence generic name is metasequoia)

3. Wellingtonia or giant redwood/sequoia (University Museum of Natural History)
    - Native to the Sierra Nevada in California
    - Oldest tree aged by tree ring analysis is 3,500 years old
    - Can grow to > 100m high and 27m in girth. Largest living thing (by volume)
    - Introduced into UK in 1853 where a craze for them developed. Most that we will see today date from the 1860s and 1870s and so are around 140-150 years old (mere youngsters!)
    - Cones ripen in 2 years. Here they drop off the tree in a few years, but in their native California they can remain on the tree for 20 years.
    - Wood is very soft and brittle and often shatters when a tree falls. For this reason logging was not very commercially viable as <50% of the wood made it from tree to the timber mill even though loggers would dig a trench and fill it with branches to try and give the tree a "soft landing".

4. Bhutan Pine (Norham Rd outside Maison Francais)
    - Native to cool areas in Himalayas, from Afghanistan to Nepal
    - Introduced into the UK in 1823
    - True pine trees have needles in bunches of 2, 3 or 5 with a papery sheath at the base. The Bhutan pine is a five-needled pine tree
    - Mostly planted for ornament, but also for timber (in Italy)
    - Very distinctive large resinous cones (watch out the resin is very sticky!)

5. Chilean Pine or Monkey Puzzle (Park Town)
    - Native to Chile and Argentina
    - Introduced to the UK in 1795
    - Often individual trees either bare male or female “flowers” but not always both
    - Generic name is Araucaria which might be familiar to fans of the Daily Telegraph crossword!

6. European Larch (Charlbury Rd/Bardwell Rd)
    - Native to continental Europe
    - Thought to be introduced to UK in 1600s
    - Deciduous
    - Used in forestry as a preparatory and a nurse species
    - Capercaillies eat buds & young cones

7. Deodar Cedar (Charlbury Road)
    - Native to the West Himalayas and Afghanistan
    - Introduced to UK in 1831
    - New shoots arched and grows in a more drooping form than other cedars with longer leaves (or needles)

8. White (or Colorado) Fir
    - Native to the mountains of western America
    - Climax species as it is very shade tolerant
    - Popular Christmas tree – good needle retention
    - Like all firs, cones are only found at the very top of the tree
    - Like all firs, the cone is upright on the branch (like a candle on a Christmas tree)
    - Like all firs, the needles are attached to the stems by roughly circular pads (not pegs). So when you pull needles off the resulting stem is smooth.

9. Norway Spruce (Summerhill Road)
    - Native to continental Europe from Alps to Scandinavia and Balkans to Russia
    - Probably introduced to the UK before 1500
    - Popular as Christmas trees
    - Like all spruces the cone hangs down from the branch
    - Like all spruces the leaves or needles are attached to the branch by “pegs” so that when you pull needles off, the resulting stem is rough as the “pegs” are left behind.

10. Douglas Fir (Ridgemont Close)
    - Native to west coast of N. America from British Columbia to Mexico
    - Introduced into the UK in 1827
    - Named after the Scottish explorer David Douglas
    - Very easy to identify the cones as the have a distinctive 3-pronged bract which points towards the tip of the cone
    - Grows very fast, with shoots growing up to 1m per year. Tallest tree in Britain is a Douglas fir near Inverness which is over 217 ft high. Huge stands can be found in the New Forest. Not common in Oxford where most trees are relatively small and young.

11. Stone Pine (Mulcaster Avenue, Kidlington) – aka umbrella pine
    - Native to the Mediterranean
    - What you think of when you think of "the pines of Rome"
    - Probably introduced into the UK before 1500
    - A two needled pine tree
    - Large globular pine cones that take 3 years to mature
    - Cultivated in the Mediterranean for many millennia (possibly as long as 6,000 BP) for "pine nuts" although nowadays most commercially grown pine nuts come from the Korean Pine and are cultivated in China.

12. Monterey Pine (Road to the N. Oxford Tennis Club)
    - Native to a very small area around Monterey and Cambria in California
    - Introduced to the UK in 1833
    - A three-needled pine tree
    - Large cones that are very unsymmetrical at their base and are clustered in groups of three or five directly on the branch
    - Cones are retained on the tree for up to 20 years
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13. Corsican Pine (Cutteslowe Park)
    - A sub-species of black pine (pinus nigra)
    - Introduced into the UK in 1759
    - Native to Corsica, Sicily and S. Italy
    - Probably the most commonly planted pine in Oxford in Parks, road verges etc
    - A two-needled pine tree
    - Bark is more grey than Scot's pine with vertical fissures.
    - Needles are longer and brighter green than Scot's pine and have a tendency to curve upwards. Easy to tell from Scot's pine when you see them together
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14. Scot's Pine (Cutteslowe Park)
    - Only UK native conifer, only native to Scotland where it grows in upland forests. Also continental Europe from Spain to Siberia and Lapland
    - National tree of Scotland!
    - Pollen records show that it's been present locally in S. England since 9,000BP
    - A two-needled pine tree
    - In older trees, the bark looks a bit like "crocodile skin" and has patches that are noticeably red in colour
    - Often planted along drover roads to mark places where drovers would camp overnight or inns they regularly used. In the early days of railway stations, rail companies used them to mark stations (in those far off days when people walked!)

15. Atlas Cedar (Cutteslowe Park)
    - Native to Atlas Mountains of Algeria and Morocco
    - In UK usually found as the "glauca" or blue atlas cedar variant