

Slash pine (*Pinus elliottii*, Pinaceae) in Auckland

Rhys Gardner

Introduction

On the Whau Creek between New Lynn and Green Bay, behind Shadbolt Park's pylons and playing fields, there is a band of tall, picturesque pine trees (Fig. 1). I have known these trees all my life (passing them, for example, when going from my boyhood home to Blockhouse Bay's Kosy Picture Theatre) but never have I wondered exactly which species they represent, and it has taken the advent of a remarkable urban forest book (Wilcox 2012: 74) to remedy such a deplorable and prolonged lapse of curiosity.

The group contains a number of large radiata pines (*Pinus radiata*), and this, together with maritime pine (*P. pinaster*), dominates the nearby bush areas of Craigavon Park and the Titirangi Golf Links. But it mostly consists of a much less common species, *Pinus elliottii*, the slash pine. There are c. 35 individuals here (and another two southwards, close to Portage Road); they reach c. 25 m tall, and have trunks of 20–60 cm d.b.h. They can be distinguished

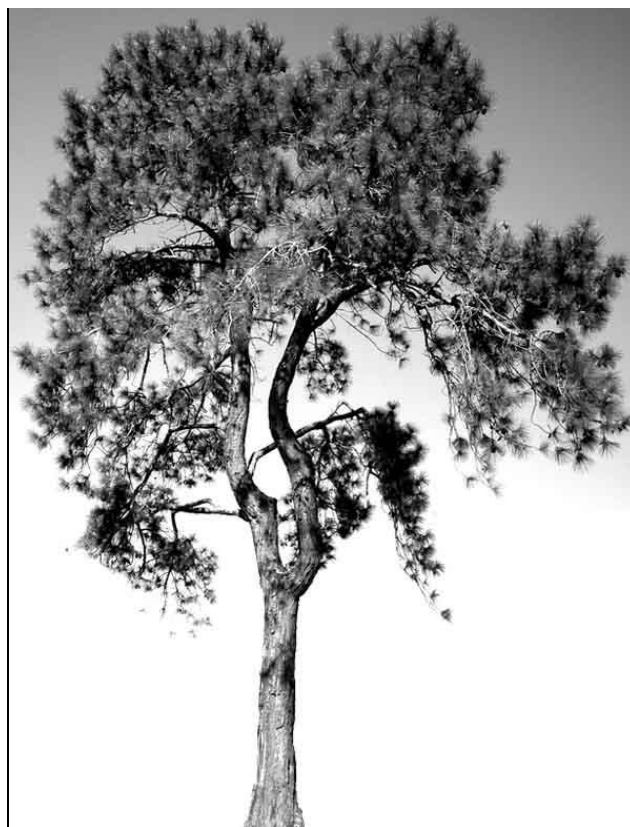


Fig. 2: *Pinus elliottii*. Tree c. 15 m tall and 50 cm dbh, at Shadbolt Park, by Portage Road and skateboard rink. Photo: ROG, August 2015.

from *P. radiata* by their generally lesser stature, lighter coloured bark, less densely foliated and rather ungainly crown, and longer, mid-green (rather than dark green) needles (Fig. 2).

The scrappy undergrowth here is a head-high scrub of *Ligustrum sinense*, *Coprosma robusta*, *Pittosporum crassifolium* and *Cordyline australis*, over a sward of meadow rice-grass (*Microlaena stipoides*). Slash pine is not regenerating.

I know nothing of the stand's history. A few ring counts have shown that the trees are c. 70 years old, and there seems to be a young scrub, probably of pines and teatree, at the right place on an oblique aerial photograph "Titirangi Golf Links", taken in 1946 by White's Aviation (Alexander Turnbull Library, item WA 02413). They grow mainly on the low interfluvium between the main course of the Whau (here also known as the Avondale Stream) and an unnamed tributary coming in from the southeast — if they are an old plantation, it is as if the person who made it had known that the species grows naturally on periodically flooded sites. A look at adjacent properties did not discover any older individuals, that might have been parents for some one-off naturalization, as, say, after a fire.

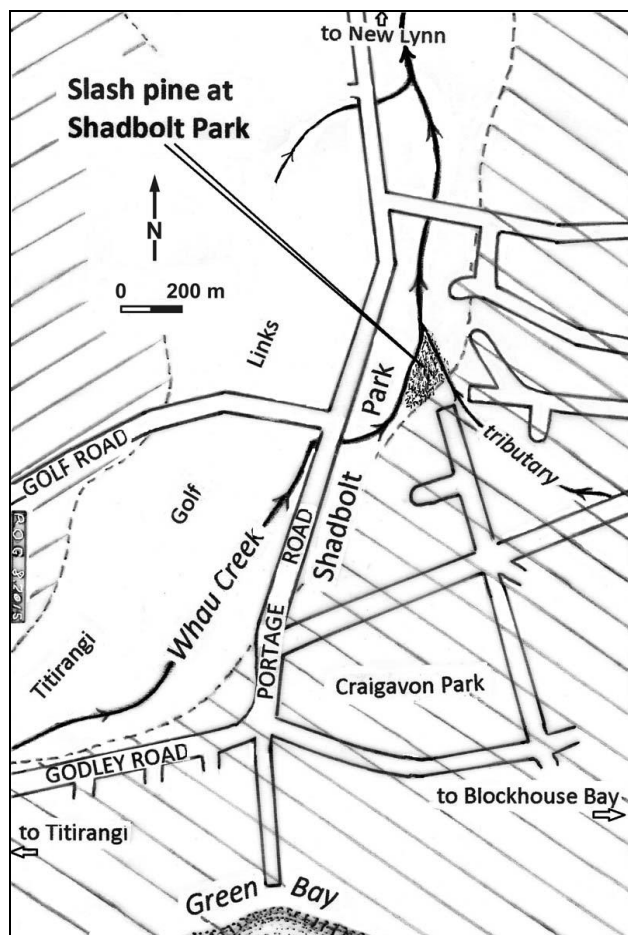


Fig. 1: Location of *Pinus elliottii* at Shadbolt Park. Stand is at northern end of park, within the floodplain of the Whau Creek (non-hatched zone), on the creek's true right bank. Base map: "Geology of the Auckland Urban Area", 1: 50,000 (L. O. Kermod, Institute of Geological and Nuclear Sciences, 1992).

Related species

This "find" led me to seek out two related species also uncommon in Auckland: *P. palustris*, the longleaf pine, and *P. taeda*, the loblolly pine. Salmon (2000) and Wilcox (2012) provide Auckland localities for them, so I have been able to examine living material and work up some identification tips.

The three species, along with a fourth, *P. echinata*, which we don't seem to have in New Zealand, belong to what is called the "southern yellow pines" group, native to the south-eastern USA. Something of their character, ecology, and history of utilization can be found in books by two erudite and observant treesmen (Peattie 1948, Kingsbury 2014). I just note that *Pinus palustris* used to be one of the world's most valuable trees, for its timber and for what in the USA was called "naval stores", that is, turpentine, pine oil, pitch and tar. Now occupying just a fraction of its pre-European range it has become an iconic species for forest conservation in the southern USA.

Identification

First we need to be sure that the pine we are trying to identify does belong to the southern yellow pines group. For the Auckland region this means being able to exclude the single other species which has needles at least 15 cm long and grouped in threes, that is, the Canary Is. pine, *P. canariensis*. It is easy if there are cones, since these are prickly in the southern yellow pines but not in *P. canariensis*. Also, the latter is one of the very few pines to produce an occasional new shoot from the lower part of its trunk (Fig. 3) — see the tree in the Auckland Domain, on the level ground behind the southern entry to the Auckland War Memorial Museum, and also, the one near the middle of Western Park, Ponsonby. .

Photographs of *P. canariensis*, *P. elliotii*, *P. palustris*, *P. radiata* and *P. taeda*, some of them Auckland trees, with close-ups of bark, leaves and fertile parts, are given by Salmon (2000).

Notes to the Key

1. This key is based on the descriptions of Gausсен et al. (1993), Kral (1993), and Eckenwalder (2009), with the qualification that our plants are taken to represent the typical form of each species (a variety has been described in *P. elliotii*, and hybrids, including with *P. echinata*, are known too).

2. The "winter bud" is a vegetative bud, conspicuous at the branchlet apex as it ceases lengthening during the colder months; some books call it a "resting bud". It is relatively large and conspicuous in *P. canariensis* (Fig. 4) and *P. palustris*.

3. Female cone size and shape refers to the mature cones, when the scales have moved apart to allow seed to be shed (which in these pines takes place in the summer, a year after fertilization). See Fig. 5.



Fig. 3: Small new shoot from low on trunk of *Pinus canariensis*. Shoot's foliage is c. 50 cm diam. Tree at 2140 Gt North Road, Avondale. Photo: ROG, August 2015.



Fig. 4: Winter bud of *P. canariensis*. Bud is c. 5 cm long. Tree as in Fig. 3. Photo: ROG, August 2015.

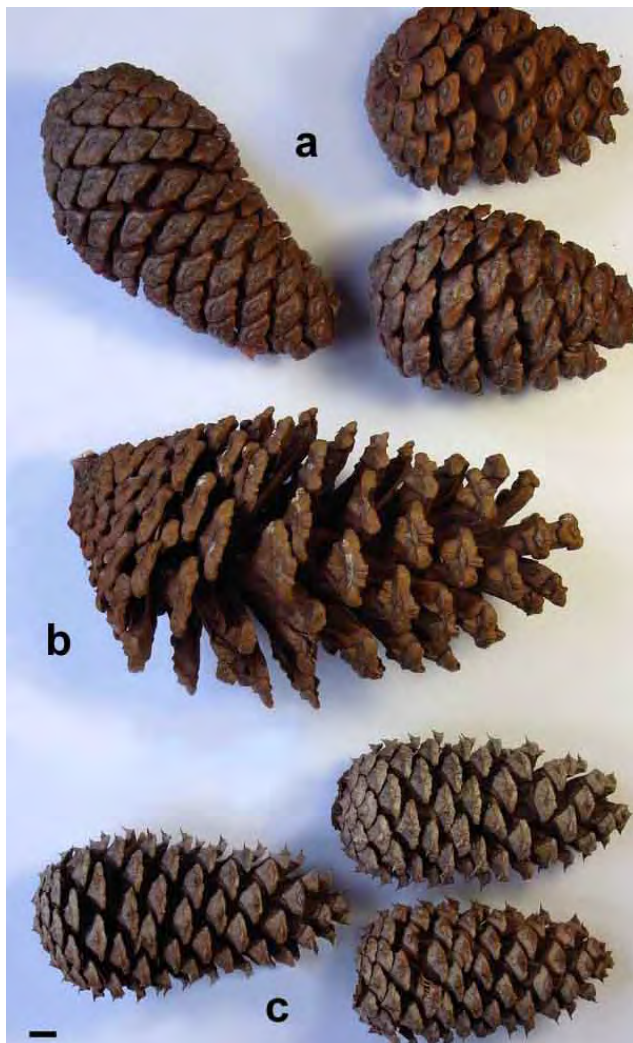


Fig. 5: Mature female cones of the southern yellow pines. **a** *P. elliotii*. **b** *P. palustris*. **c** *P. taeda*. Ruler (15 cm) scale. Unvouchered material. Photo: ROG, 2015.

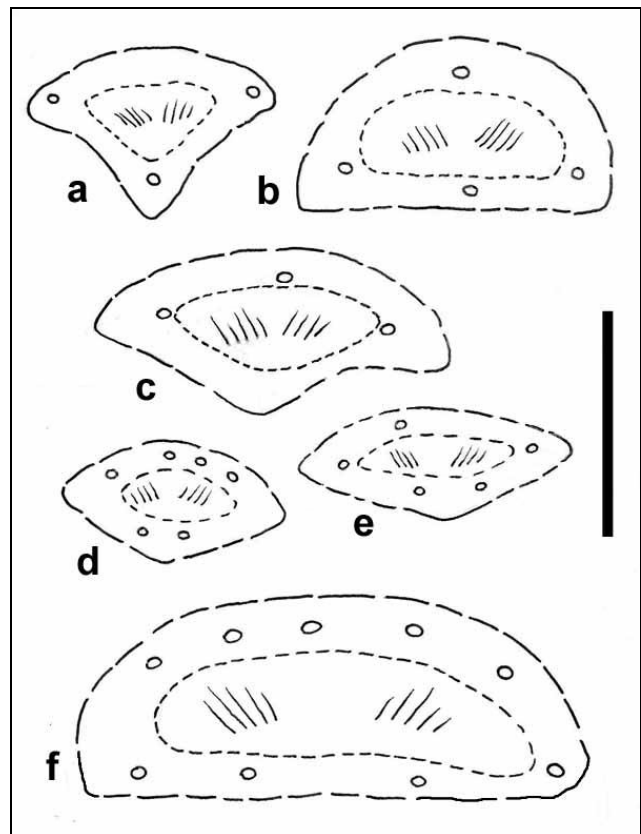


Fig. 6: *Pinus* spp., t.s. of needles at about midpoint. Diagrammatic: resin canals as circles in the outer zone of tissue (mesophyll and hypodermis), transfusion tissue and two vascular bundles inside dashed line. Gaps in epidermis indicate position of the stomatal lines. Scale bar 1 mm. Unvouchered material. **a** *P. canariensis* canals medial to marginal. **b** *P. elliotii* canals internal to medial. **c** *P. palustris* canals internal to medial. **d** *P. radiata* canals medial. **e** *P. taeda* canals internal to medial. **f** *P. pinaster* canals medial.

4. The resin-canals of a needle (Fig. 6) are: "internal", when they are positioned at the inner edge of the green mesophyll tissue, against the central zone of transfusion tissue with its two vascular bundles; "marginal", when they are close to the fibrous hypodermis and epidermis; "medial", when they lie more or less midway between these extremes, within the mesophyll. The number of canals can sometimes be determined by slicing across a living needle on an angle then pressing to extrude the resin, but their position is most readily seen in a t.s. of a dead needle. In contrast, a needle's stomatal lines are easier to see on the live plant, when the white wax around each stoma shows vividly.

5. On the principle of proceeding from the known to the unknown I have included *P. radiata* in the Key, and maritime pine (*P. pinaster*) in Fig. 6.

6. The edges of the needles recurve in drying, reducing apparent width, so the information given in the key applies just to live or rehydrated material.

Key

1a Scales of mature female cones not prickly-tipped (young cones of *P. radiata* may have a deciduous short mucro) 2

1b Scales of mature female cones with a persistent stout sharp prickly several mm long [the yellow southern pines, and other spp. that are not treated here]; needles c. 1.4–1.7 mm wide, their convex face with c. 10 lines of stomata, their resin canals internal to medial 3

2a Needles relatively slender, usually c. 20 cm long and 1.25 mm wide, and with 4–5 lines of stomata on their largest (convex) face; resin canals medial to marginal; winter-buds relatively large and conspicuous, 1 cm diam. or more, the tips of the bud-scales free and reflexed, not resinous; female cones short-stalked, 10–20 cm long, symmetrical *P. canariensis*

2b Needles more robust, to 10(–15) cm long, c. 1.4 mm wide, usually c. 8 lines of stomata on their

largest (convex) face, resin canals medial; winter-buds not reaching 1 cm diam., the bud scales appressed, slightly resinous; female cones sessile, 7–15 cm long, very asymmetrical *P. radiata*

3a Needles 3 per fascicle (occasionally 2), the longer leaves usually 20–30 cm long; winter buds with scales that are conspicuously pale, fimbriate, and spreading to reflexed; pollen cones 2–6(–8) cm long; female cones ovoid, 15–25 cm long, dull brown *P. palustris*

3b Needles 2 per fascicle (occasionally 3), mostly 10–20 cm long; winter buds with appressed scales 4

4a Needles usually 15–20 cm long; pollen cones 3–5(–8) cm long; female cones usually ovoid and 9–15 cm long, reddish brown and somewhat glossy *P. elliotii* var. *elliotii*

4b Needles usually 12–18 cm long; pollen cones us. 2–4 cm long; female cones usually subcylindric and 6–12 cm long, dull yellowish- or greyish brown *P. taeda*

Notes on the species

Pinus elliotii Engelm., slash pine

The common name refers to the often scrubby habitat of this pine. Our trees all belong to var. *elliotii*, widespread in the southern USA. The other variety, var. *densa*, which has a "grass stage" to its seedlings (see below under *P. palustris*), is confined to the southern half of Florida.

In addition to the stand at the northern end of the Shadbolt Park stand there is also a grouping of seven fairly old trees at Western Springs, between the motorway and Great North Road. There is also a group of five good-sized trees on the northern side of Chamberlain Park Golf Course, alongside the cycleway (Wilcox 2012). Others are to be seen at the western end of Centennial Park, Campbell's Bay, by the golf course. A more accessible tree is the one on the flat planted area on the southern side of the Auckland War Memorial Museum. Perhaps all these trees are from a single Auckland City Council seed accession?

References

- Eckenwalder, J. E. 2009: *Conifers of the World*. Timber Press, Portland.
Gausson, H.; Heywood, V. H.; Chater, A. O. 1993: *Pinus. Flora Europaea* 1: 40–44. 2nd edn. C.U.P.
Kingsbury, N. 2014: *The splendour of the tree*. Frances Lincoln, U.K.
Kral, R. 1993: *Pinus. Flora of North America* 2: 373–398. O.U. P.
Morton, P; Morton J. 1993: *Just Scrub*. 2nd edn. Centennial Park Bush Society/North Shore City Council.
Peattie, D. C. 1948: *A natural history of trees of eastern and central North America*. Houghton Mifflin, Boston.
Salmon, J. T. 2000: *The Trees in New Zealand: Exotic Trees – The Conifers*. Reed Books, Auckland.
Spencer, R. 1995: *Horticultural flora of south-eastern Australia*. Vol. 1. University of New South Wales Press, Sydney.
Wilcox, M. 2012: *Auckland's remarkable urban forest*. Auckland Botanical Society Bulletin 29.

Pinus taeda L., loblolly pine

Peattie (1948: 25) says that "Down in eastern North Carolina a loblolly is a natural pocket or depression, and in such situations grows the Loblolly Pine. But it is not confined to such areas. It takes over abandoned, worked-out, cut-over or burned fields on the coastal plain ...". Wilcox (2012) mentions trees in Wesley Park and Hayman Park, Manukau City.

Linnaeus's epithet "*taeda*", meaning torch, would derive from information he had been given about the use for the very resinous wood. In the USA good ol' boys still prize southern yellow pine "fatwood" for starting their barbecues; it now comes mainly from ancient stumps brought to the surface during plowing or land development.

Pinus palustris Mill., longleaf pine

The epithet "*palustris*" refers to the low-lying ground this pine often grew on. It is the largest and longest lived of the three species here, but shares the others' preference for occasionally flooded soils of relatively low fertility. Early American traveller and botanist William Bartram (fl. 1770s) called it "broom pine", apparently because young plants could be trimmed into such objects.

The seedlings of *P. palustris* are nearly unique (*P. elliotii* var. *densa* has the character too): they pass their first five or so years in a "grass stage", as densely foliated plants no more than ankle-high; their growth is concentrated in the taproot, and the tight packing of the foliage protects the apical bud from fire.

The several trees at Centennial Park, Campbell's Bay, seem to be the only longleaf pines in our region. In their guide to this reserve Pat and John Morton (1993: 38) called them *P. ponderosa*, an excusable misidentification because the cones are indeed strikingly large. The species seems to be uncommon in Australia too, but there is a famous old example at Melbourne's Royal Botanic Gardens, below the Craft Cottage: "33 m tall, trunk clear for 12 m, probably part of the original Mueller pinetum and well over 100 years old" (Spencer (1995: 258).