FOREST PRODUCTS

(Ken Matthews and Sean Ryan 2003)

The intent of this information is to provide a guide to the range of timber products that may be available from native forests. Stumpage is drastically reduced at greater haulage distances, poor property access, long snig distances, etc)

Mill gate price $/m3 – (cut $/m3 + snig $/m3 + haul $/m3) = STUMPAGE

Sliced veneer logs

Sliced veneer logs need to be of a very high quality, free of defect such as borers, knots, bends, bumps or fungal decay. High prices can be received for sliced veneer logs.

Poles

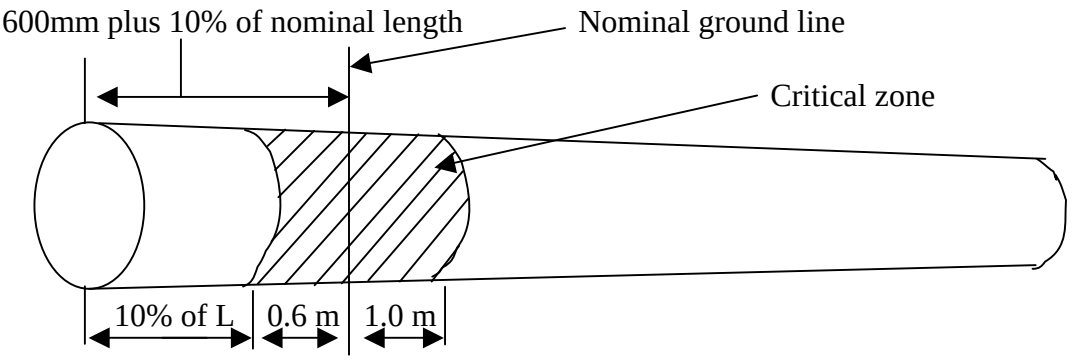
It is estimated that there are 5 million timber utility poles in Australia with a current net worth of 10 billion dollars. In South-East Queensland alone, there are 500 000 poles in service. Poles are amongst the highest valued forest products, although it is the larger sizes that are by far the more valuable. It is extremely important to understand the regulatory guidelines (AS 2209-1979) that govern if a log meets the pole standards.

Electrical transmission poles vary from a minimum of 8.0 m long and 175 mm diameter under bark (ub) 2 metres from butt end (D-line) through to 30.5 m long, 565 mm diameter ub.

Some of the limiting factors in pole specifications are:

- **No fault in critical zone (approx 1m to 3m from butt end depending on length)**
- **No two faults per metre above critical zone, max of 6 (encased bark must be drained)**
- **Branches cut flush with bark (encased bark must be drained)**
- **Presence of rot or insect attack**
- **Degree of pipe or gum veins.**
- **Thickness of sapwood**
- **Degree of mechanical damage**

Critical zone (no fault zone)



Critical zone table

Critical Zone Table		
Pole length (m)	**Nominal ground line - measured from butt (m)**	**Critical zone measured from butt (m)**
9.5	1.550	0.950 to 2.550
11.0	1.700	1.100 to 2.700
12.5	1.850	1.250 to 2.850
14.0	2.000	1.400 to 3.000
15.5	2.150	1.550 to 3.150
17.0	2.330	1.700 to 3.300
18.5	2.450	1.850 to 3.450
20.0	2.600	2.000 to 3.600
21.5	2.750	2.150 to 3.750
23.0	2.900	2.300 to 3.900

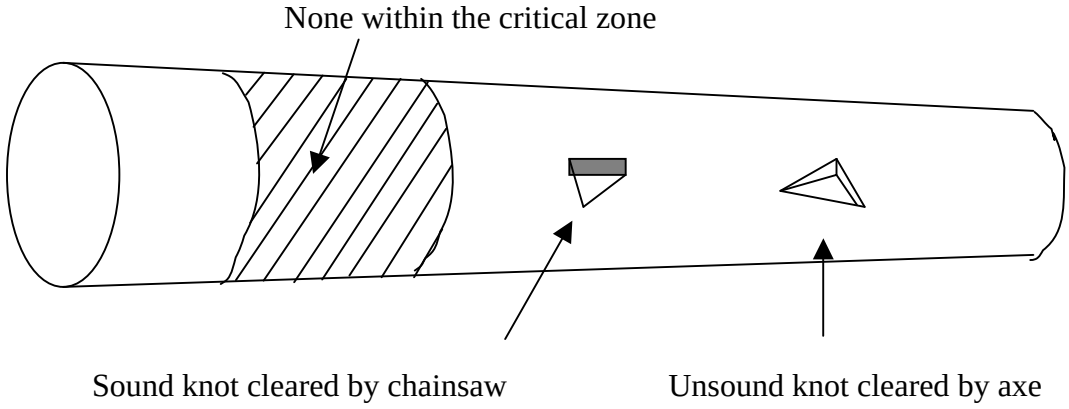
Unsound Knots

A knot is the remaining portion of a branch with fibres of the wood deflecting around the entire knot. 'Unsound' usually means the knot has either rot associated with it, is not solid across the face, is checked or split and is a defect on the surface of a pole. This allows moisture to accumulate in the defect and leads to decay inside the treated exterior. This defect needs to be drained (cleared). This can be accomplished with the tip of the chainsaw trenching out the defective section allowing it to freely drain when the pole is in an upright position. The specification for knot-size is outlined below.

The size of the knot is measured as the distance between two lines parallel to the longitudinal axis of the pole and enclosing the knot or cluster of knots. The diameter of an enclosed knot must be measured to the sound wood of the pole on either side of the knot.

Where an unsound knot is cleared (i.e. dressed), the width of the clearing must not exceed 10% of the circumference of the pole at that point and also should not exceed 5% of the circumference of the pole in depth. No cleared knots are permitted in the critical zone and no more than six are permitted elsewhere in the pole. Unsound knots outside the critical zone must be spaced more than 1 metre apart. For example a pole, which has a circumference at the point of the unsound knot of 800 mm, may be cleared to a maximum of 80 mm (10%) in width and 40 mm (5%) in depth and must be self-draining.

Diagram 2. – Unsound knots

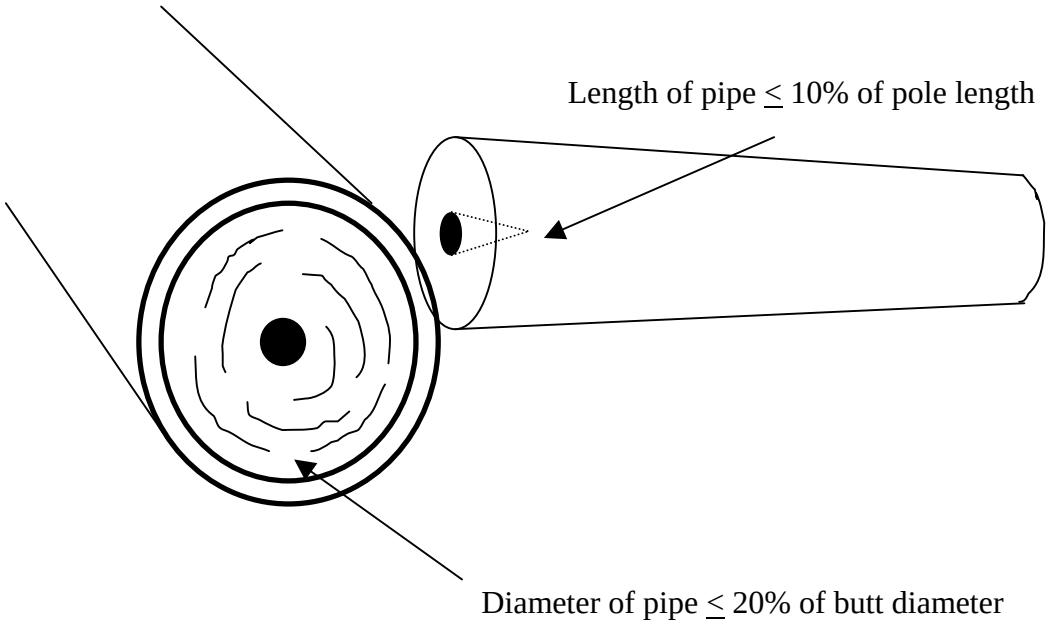


Pipe

Pipe is a longitudinal cavity along the centre of a log as the result of the breakdown of the wood in the tree's centre by growth stresses, fungal and/or termite attack, and/or biochemical means.

A pipe which is not associated with any decay would be tolerated at the butt end of the pole provided that the diameter of the pipe does not exceed 20% of the diameter of the pole at the butt, and the length, after all obstructions have been cleared, does not exceed 10% of the overall length of the pole.

Diagram 3. – Allowable pipe for poles



Ring Shakes, Loose or Open Gum Veins and Encased Bark

A ring shake is a partial or complete separation of adjoining layers of wood due to causes other than drying and usually originating either in the standing tree or in the log during felling or processing.

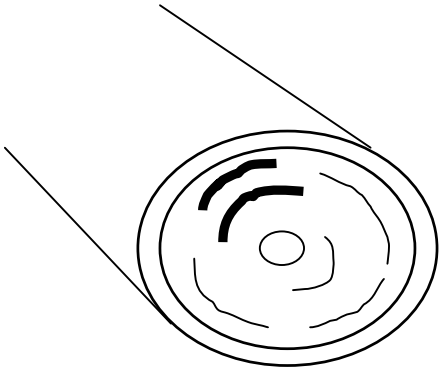
Gum veins are ribbons of gum (kino) between growth zones, which may be bridged radially at short intervals by wood tissue. Gum veins can develop in trees as a result of injury to the cambium layer. Some species, such as the Bloodwoods, are especially prone to gum vein development and there are some indications that they may be influenced by genetic as well as environmental factors. A loose gum vein is one associated with extensive discontinuity of wood tissue.

Ring shakes and loose or open gum veins visible at the head of the pole and within 38 mm of the edge, or within 25 mm of the edge at the butt, must not exceed two in number and individually must not exceed 10% of the circumference of the pole. Encased bark associated with double heart must not be closer than 50 mm to the edge at the head of the pole.

Allowable ring shakes or open gum veins

Ring shakes and loose or open gum veins within 40mm of the surface at the head of the pole or within 25 mm of the surface at the butt-

- $\leq$ 2 in number
- Individually $\leq$ 10% of the circumference



Piles

Piles are like poles except that the small end of the log is driven into the soil and then they are used to anchor and support concrete slabs being laid over suspect ground. Specifications are similar to poles but piles usually have less stringent defect specifications e.g. No critical zone. Piles are saleable down to as small as 4 m with a 150 mm small end diameter (SED).

Common pile sizes

Length	Small end diameter classes
4.0, 6.0, 8.0, 9.5, 11.5, 12.5	150 – 179 mm, 180 – 199 mm, 200 – 219 mm, 220 – 249 mm

Note: The 150 mm small end class is only usually applicable to 9.5 m lengths and under.

The greatest market demand is for sizes: 6.0, 8.0 and 9.5 m @ 150, 180 and 200 S.E.D

Australian Standard (AS 3818.3-2001) provides specifications in relation to species, defect, strength grading, etc.

Pile ends

The butt end and the toe shall be cut generally square to the axis of the pile and, unless otherwise specified, the bark shall be removed. The Australian standard should be referred to in relation to end cracking. In general a nominal amount of end cracking is permissible.

Length

Piles shall not be less than the length ordered and not exceed the length by more than 200mm.

Diameter

The pile shall not be less than the specified diameter anywhere along the length. The diameter at the toe shall not exceed the specified diameter by more than 50mm.

Straightness

This is a highly contentious issue as the specification is (a line joining the mid point of the toe to the mid point of the butt must lie within the pile), but many merchant require a higher standard.

Spiral grain

The inclination (gradient) of the grain at the surface to the axis of the pile shall not exceed 1 in 10 when measured over any 1 m of its length.
Numerical ratings for end splits and barrel checks

Mechanical damage

Tong and cant hook punctures – few and individual areas not exceeding an area equivalent
to 40 mm x 40 mm. Any other mechanical damage – width not exceeding one tenth of the circumference of the pile and not extending into the heartwood.

Dry side

Only allowable in piles of durability 1 & 2 species, width – not exceeding one tenth of the circumference of the pile.

Grub/Insect holes

Not greater than 30mm diameter. Species, which are susceptible to Lyctid borer attack, may need to be sprayed with a synthetic insecticide as soon as possible after felling to prevent degrade while in storage before preservative treatment.

Pipe **at butt end only – not exceeding 35 mm and not extending one tenth of the pile length**.

Orders may nominate one or more species, stress grade and durability class.
Where a species is not nominated any species listed below may be supplied provided any stress grade or durability class in the order is met.

Trade Name	Botanical Name	Strength Group S1 strongest	Durability Rating 1 highest	Lyctid Susceptible	Min sapwood Thickness
Grey Gum	*E. major, propinqua and longirostrata*	S1	1	Resistant	N/A
Grey Ironbark	*E. siderophloia*	S1	1	Resistant	N/A
Blackbutt	*E. pilularis*	S2	2	Resistant	N/A
Broad Leaved Red Ironbark	*E. fibrosa*	S2	1	Resistant	N/A
Grey Box or Gum-Topped Box	*E. moluccana E. woolsiana*	S2	1	Susceptible	N/A
Gympie Messmate	*E. cloeziana*	S2	1	Resistant	N/A
Narrow Leaved Red Ironbark	*E. crebra*	S2	1	Resistant	N/A
Red Mahogany	*E. resinifera*	S2	2	Susceptible	N/A
Spotted Gum	*Corymbia citriodora*	S2	2	Susceptible	N/A
Tallowwood	*E. microcorys*	S2	1	Susceptible	N/A
White mahogany/ Yellow Stringy	*E. acmenoides E. umbra*	S2	1	Resistant	N/A
Forest Red Gum	*E. tereticornis*	S3	2	Resistant	N/A
Red /Pink Bloodwood	*C. gummifera & intermedia*	S3	1	Susceptible	N/A
Turpentine	*Syncarpia glomulifera*	S3	1	Resistant	N/A
Carbeen/ Moreton Bay Ash	*C. tesselaris*	S1	2	Susceptible	N/A
White Stringybark	*E. eugenioides*	S3	2	Resistant	N/A

Marine piles

Class 1 durability species can be marketed as hardwood marine piles.
Marine piles must meet specifications laid down by the Marine and Ports Division of Qld Transport and (AS 3818.3-2001). Marine piles range from 8 m with a small end diameter of 150 mm. Turpentine is regarded as a superior marine pile.

House poles and stumps
House poles and stumps are round-wood that meet specifications such as: very straight, very round, minimal defect and durability 1 and 2 species. Round-wood suitable for stumps can be as short as 2.1 meters long. House poles generally are a minimum of 8 m long.

Sawlogs
Sawlogs are one of the standard products that come from forests. Sawlogs at this stage must have at least 300mm small end diameter and be a minimum of 2.4m long increasing in 0.3 m increments, plus 0.1 m for each cross cut.

Sawlog specification Guide

- Limbs affecting less than 50% of the circumference of the log at any point,

- End of log defect affecting less than 50% of the end section (large diameter), 25% small diameter

- Degree of bend, this varies with centre girth, (as a guide, - 40 cm - 2.5º, 40 – 49 cm - 5º, 50 cm+ - 10º), often a bent log can be cut into 2 shorter straight logs

Specifications for allowable pipe for sawlog

Allowable Pipe	
Centre Diameter of Log ub (cm)	**Pipe Diameter**
30-34	**5**
35-39	**17**
40-44	**20**
45-49	**24**
50-54	**24**
55-59	**28**
60-64	**34**
65-69	**38**
70-74	**42**

Non-lyctid susceptible species include: all pines, the sheoaks, blackbutt, brush box, grey box, yellow box, grey gum, forest red gum, flooded gum, most of the iron barks, white mahogany, Gympie messmate, turpentine, Queensland maple and most of the paper barks.

Sleeper/ landscape block or salvage grade logs
Salvage grade logs are of poorer quality than standard Sawlogs. Salvage classification is given to logs failing sawlog specifications due to pipe size, number and size of limbs, degree of bend or small end diameter. Many mills will accept salvage grade logs with a small end diameter of 27 cm under bark and usually 2.4 m billets; occasional 2.1 m are accepted.

Bridging Girder (Main Road's standard girder):

Bridging girders are a premium forest product. The minimum length is 9.6 m with a small end diameter of 450 mm. Girders need to be straight, have a minimal amount of pipe or knots and be durability class 1 and 2 species.

Fencing material
Fencing material includes strainer posts, split posts and rails. Species preferences vary between districts. Fencing material is a good option for trees that are suppressed or have bad form. The durability of the species is important. Timber for caps and rails can be class 2 species and unless appropriately treated with preservative, posts and strainers need to be durability class one species. Generally fence timbers need to be slow grown with little sapwood. Due to the thick sap wood often associated with red Bloodwood (unless very slow grown) rounds need to be sapped, but even so is often not well regarded. Big old trees suitable for splitting are the opposite and considered to be nearly as good as yellow stringy.

All fencing material needs to be well presented, debarked and any branch stubs and branches trimmed back to the round of the post.

Yard posts 250-400mm D x 2.4m long or as specified, straight, can have trimmed branches, must be straight, **durability 1**

Strainers 200 – 250 for driven posts, 200-350mm D for rammed, 2.1-2.25m L, trimmed branches, can have wobbles or one bend if rammed, **durability 1**

Light Strainers or in Line Round Posts 150-200 mm D, usually driven, 2.1m L, straight, **durability 1**

Splits 125-150mm arc measurement, 2.1m L, **durability 1**

Caps and Rails Usually 150mm+, often requested to match size of posts, usually 3m L, **durability 1-2**

Stays 100 – 150mm D, can be a bit bent, little sap, 3m L, durability 1

Firewood
The firewood market is quite large in some regions and firewood is again a good option for trees that are suppressed or have bad form.

Take the time to investigate and understand the markets in your region as well as the potential products that your forest can produce. Depending upon the location of your property, some markets may be less favorable due to distance constraints. Opportunities may exist to add value to the trees you are growing by directing the management for specific products.

MARKETING

The applicable forest products for any landholder will vary from one area to another depending upon a range of factors. Obviously species, merchantable length, available volume, etc all have an impact. The variable that has the greatest impact upon market access is the distance to the prospective purchasers. Some of the forest products that may be sold in your area could include: Sawlogs, salvage grade logs, poles, piles, mining timber, bridge girders, and a range of fencing material (Splits, rails, caps, strainers and stays). You may have a property that grows the best quality poles in Queensland yet is 700 k from the nearest pole purchaser. This is not to say that when demand is high, buyers would not wear the extra cost of long haulage, but knowing the state of the market is critical to this decision.

For each forest product there are sets of specifications, which need to be met in order to access the market. For some products such as poles, veneer logs and girders the specifications are particularly tight and uniform throughout the industry. The degree of variance from the specification is limited by Australian standards, industry standards and building codes.

For other forest products such as piles fencing material and to a degree sawlogs there is a higher degree of variability from one purchaser to another. This is especially common with piling material even though there is an Australian standard. Minimum product length, small end diameter, centre diameter, allowable defect and species requirements vary from one purchaser to another. It is very time consuming, expensive and frustrating to deliver even one load and have it rejected.

Once timber is landed in the mill yard, the purchaser has the upper hand in rejecting or accepting the product. Then the supplier has to either accept a lower price or pay for the haulage to another purchaser. The easiest way of avoiding this situation is to negotiate all specifications, cut a sample load and then have the purchaser inspect the product on the logging ramp/dump before haulage.

Contacting local timber merchants/sawmillers should identify the applicable products, stumpage value and their minimum specifications in relation to species, amount of defect, length and diameter. This information alone does not give you a very clear idea of who to sell to.

Price alone should not be the determining factor for making a sale. For example a sawmill may offer $\$75/m^3$ for your sawlog and \$20/m3 for salvage compared to a second mill that offers $\$65/m^3$ and \$20/m3 for salvage. The first mill may have a set of specifications, which push 50% of your sawlogs into the salvage class, where as the second mill may take all your logs as sawlogs.

In addition to this changing quality standard, the second miller may in fact pay you on a 14-day account, whilst the first sawmill may frequently stretch the friendship on 60 days before payment.

In addition to price the end state of the forest should be a major consideration as a higher price receive may be reflected in the way operations are performed and compromises in forest protection may be experienced.

There are many other scenarios, which prompt the simple recommendation "Do Your Homework"!

It is not difficult to find out the properties that have been logged by purchasers in the past. It may be possible to inspect a block that was cut in the last 6 months and assess the utilisation level, damage to retained trees and drainage of snig tracks. Landholders are often prepared to talk about their experiences, concerns and recommendations relating to communication, payment history, etc.

Landholders who have the suitable skills, equipment and experience can achieve higher stumpage values by taking on tasks that reduce cut, snig and haul rates.

Major causes for the reduction of landholder stumpage

- Available volume
- Distance from the market
- Product length
- Product diameter
- Property access, road quality
- Property terrain e.g. Steep, rocky
- Average snig distances to loading ramp
- Product quality
- Market demand
- **Death (unskilled landholder)**

The Product Value Hierarchy

Depending upon input costs, which are impacted upon by a large range of variables, what seems to be higher in the "value" order may actually provide a significant reduction in revenue.

Value is Relative to Cost.

For example: A 9.5m 150mm SED pile at stump is generally able to return a minimum of $26 for the length when the property is within a 100 k haulage distance. This size pile has an average volume of 0.3 m^3 so it would take 3.33 of these piles to make a cubic meter of timber. When comparing the "relative value" per cubic meter of the pile i.e. $86/$m^3$ to many other products taking into account all input cost it is often surprising to realize the true hierarchy of values. This is also impacted upon the ability to access the market based on critical mass, haulage distance, appropriate machinery, skills, time, etc, etc.

There has been occasions where supplying fencing material of durability class 1 species has provided a higher net return than any other product could have for that property. It is easy to be fooled by the "High Value Sawlog" mantra.

The value hierarchy is really site, situation and market access specific.