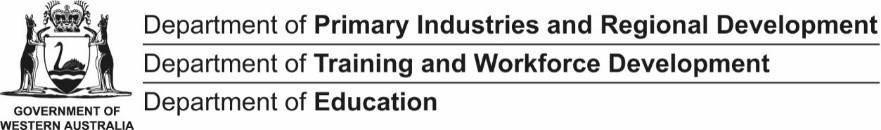
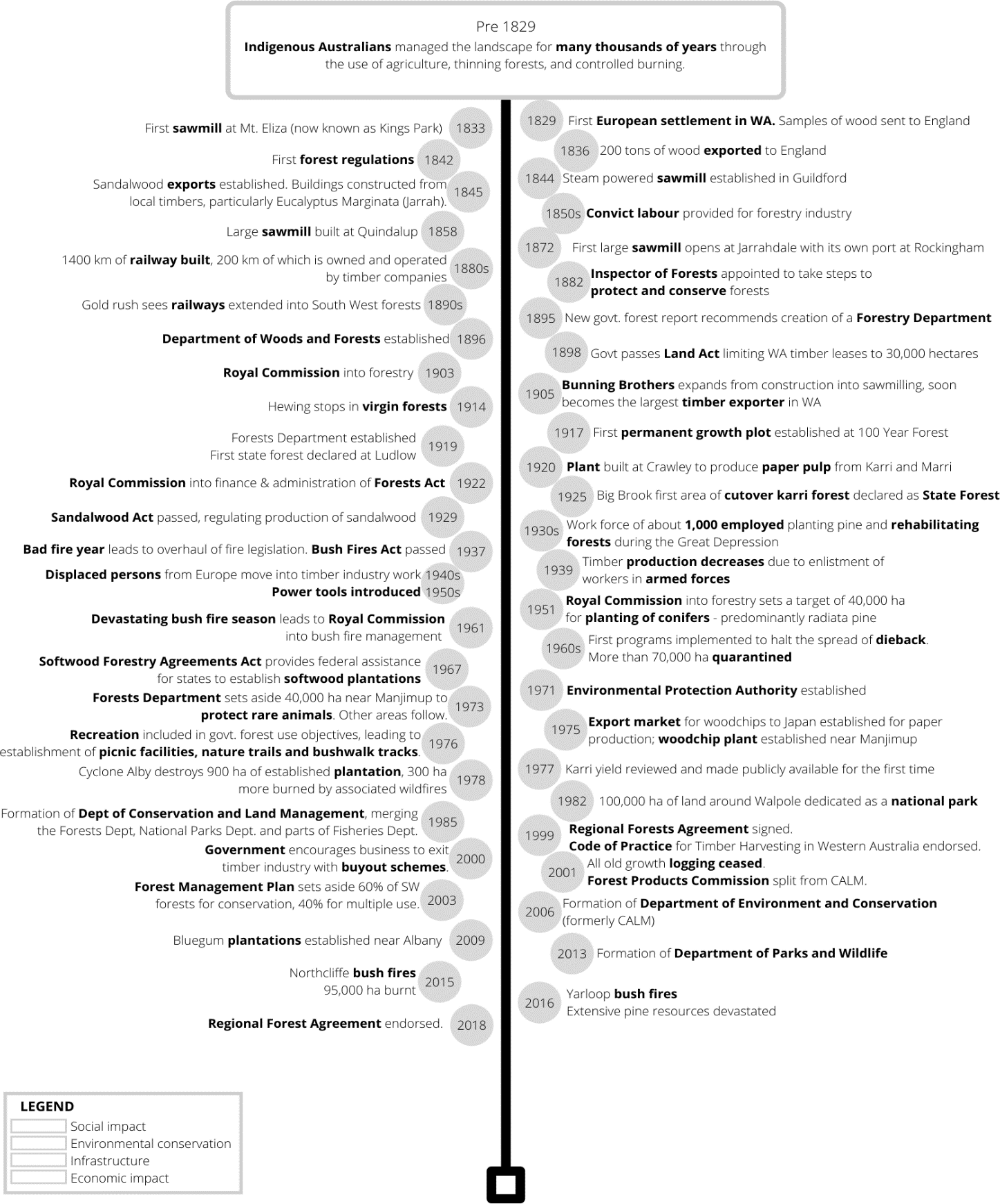
Shape

Description automatically generated



# Student resource 1.1

## Timeline of the Western Australian timber industry



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**Student resource 2.1**

## Properties of timber species

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Strength** | **Hardness** | **Durability** | **Stability** | **Growth rate** | **Aesthetics** |
| Bluegum  *Eucalyptus globulus* | Very high | Very hard | High  Rot resistant  Susceptible to insect attack | Good | Fast | Pale yellow-brown. Attractive grain patterns |
| Jarrah  *Eucalyptus marginata* | High | Hard | Very high  Rot and pest resistant | Very good | Slow | Light red to dark purple-brown |
| Karri  *Eucalyptus diversicolor* | Very high | Very hard | Moderate  Moderately rot resistant Susceptible to termites | Good | Slow | Reddish brown |
| Marri  *Corymbia calophylla* | Moderate | Moderate | Moderate  Susceptible to pests and rot | Good | Slow | Light brown to pinkish yellow  Distinctive black gum veins are desirable for aesthetic applications but can compromise strength |
| Radiata Pine  *Pinus radiata* | Moderate | Low | Low in natural form  (Able to be treated to prevent pest attack and rot) | Moderate | Fast | Pale yellowish-white  Wide growth rings and few knots |
| Tasmanian Oak  *Eucalyptus regnans* | Moderate  / high | Moderate | Moderate Resistant to rot  Moderate insect resistance | Moderate | Slow | Medium yellow to light pinkish-brown Very straight grained |
| Cypress  *Callitris columellaris* | Moderate | Moderate | High  Pest resistant Rot resistant | High | Slow | Light tan to brown, commonly with darker reddish-brown streaks |
| American White Oak  *Quercus alba* | High | Moderate | High rot resistant Susceptible to insect attack | Moderate | Slow | Light to medium brown, commonly with an olive cast Attractive flecked ray patterns |
| Beech  *Fagus sylvatic* | High | Moderate  / high | Low  Susceptible to rot and insect attack | Moderate | Medium | Pale cream colour, sometimes with a pink or brown hue Surfaces tend to be very plain with a silvery fleck pattern |
| Merbau  *Intsia bijuga* | Very high | High | Very high  Resists rot and insect attack | Moderate | Slow | Orangish-brown colour when freshly cut, which ages to a darker reddish-brown |
| Meranti  *Shorea spp. (multiple species)* | Moderate | Very low | Low  Susceptible to rot and insect attack | Moderate | Fast | Ranges from a pale straw colour to a darker reddish-brown. |

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# Student resource 3.1

## Production processes

Different materials require different processes to produce. Timber must be harvested from its source (forests or plantations) and processed from saw logs into useable timber products, while mineral-based materials like metals and plastics must be mined and extracted before they can be made into a finished product.

## The timber production process

**Timber** grows naturally in **native forests** or can be planted and managed in **plantations.** Trees are **harvested** as logs and transported to processing facilities called **mills*.*** The bark is removed, and **sawyers** use large saws and other machinery to break the logs down into useable pieces.

Logs can be processed into many forms, including:

* Boards and posts for the **construction and furniture industries**



*Image 3.1.1 Truck hauling sawlogs*

* Wood pulp for **paper production**
* Woodchips, thin **veneers** and fibers for the production of **manufactured timbers**.

Sawyers aim to maximise the useable timber taken from each log, but some is lost as sawdust.

These raw materials are then sent to **secondary processing** facilities where they are manufactured into their final form – whether that is a chair, a sheet of writing paper, or flooring materials.

## The aluminium production process:

**Aluminium** is a lightweight metal that has many applications. It is the most common metal on Earth but does not occur naturally in a useable from. It is most commonly found in the form

of **bauxite**, which is a rocky substance that contains aluminium and a number of other unwanted **impurities.**

small pieces called **ingots**



*Image 3.1.2 aerial view of an alumina plant*

Bauxite is mined and must be go through a number of processes in order to become pure aluminium.

First, the **bauxite** goes to a refinery. There it is mixed with **caustic soda** which removes impurities and produces **alumina**, a purer form of aluminium. This produces a lot of waste material, which is stored in a large lake or dam.

This **alumina** is transported to a **smelting facility** where it undergoes a process

called **electrolysis**. In this process, the **alumina** is heated to nearly 1,000 degrees Celsius and an electric current is passed through it. This produces pure molten **aluminium**, which is then formed into

These **ingots** are shipped to other facilities which turn them into all kinds of different shapes and sizes, depending on their intended use. This includes thin sheets, tubes, bars and beams. These different forms are then shipped to **manufacturers** to be made into finished products.

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