



# PERMACULTURE: DESIGN FOR CULTIVATING ECOSYSTEMS

*This somewhat flippant article was written in 1978 while I was living in the bush in Jackys Marsh, Tasmania. It uses local example to illustrate the ecological approach of permaculture to understanding and managing weeds providing an indication of my thinking on this subject the year Permaculture One was published. It was addressed to the numerous “back to the landers” in the district who I felt were falling into the pioneer mentality of battling nature. It was published in a small circulation local alternative magazine **Touchstone** and later republished in **The Best of Permaculture** edited by Max Lindegger and Robert Tapp (Nascimanere 1986). The selection of an indigenous tree, a globally cosmopolitan fern widely regarded as a weed and a European bramble despised as Tasmania’s worst noxious weed, reflected the concern amongst local landholders about these three species but it was also a deliberate attempt to show that ecological function is not necessarily related to whether plants are exotic, native or indigenous.*



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I would like to make a few observations and suggestions concerning certain weeds; Bracken, Wattle and Blackberry. These plants are common throughout Tasmania and parts of the mainland invading badly managed or abandoned farmland, logged and fired bush. To call wattle trees weeds may stir conservationists to defence but the sense in which I describe a plant as a weed is not derogatory as this article will show. An appreciation of the ecology of weeds is my aim. From this we can learn not to hate a plant just because it gets in our way and possibly how to use it to advantage.

Weeds have been described as plants out of place (ie. growing where we don't want them) which says something about us but nothing about the plants. I would say weeds are pioneer species which colonise disturbed habitats created by humans. Since disturbance in the form of flood, fire, land slip and volcanism are a part of nature, certain plants have evolved to recolonise affected environments and it is these species which comprise most of our weeds. Non-weedy species can become weeds when introduced to a new environment because natural limiting factors such as parasites are not present.

However disturbance of mature ecosystems is the prime cause of weed problems. Mankind has for the last 10,000 years or more been one of the major causes of disturbance mainly through forest clearing and burning. Its appropriate therefore that a whole array of species has evolved specifically to cope with people-created habitats.

It should be possible to recognise weedy characteristics in plants independent of whether or not they are causing us any problems.

Weeds tend to have one or more of the following characteristics:

- Short-lived relative to species of the same plant type.  
Eg Silver wattle compared to Blackwood or Eucalypts
- Abundant reproductive capacities by seeding or vegetative reproduction.  
Eg Thistles. This allows unstable areas to be quickly colonised.
- Nectar and pollen sources for bees.  
Most weeds provide some flow and many are renowned - eg. Paterson's Curse/Salvation Jane. This is an adaption which encourages a high seed set.
- Fast and vigorous growth. This helps with a quick colonisation.
- Capacity to handle very poor, compacted or leached soils.  
Eg. nitrogen fixers such as gorse or wattles. Others are specifically adapted to low humus soils. Eg Mullien.

We can say that in Tasmania, Bracken, Blackberry and Silver Wattle qualify very well as weeds in our ecological framework. What then are these weeds doing all over the countryside?

Firstly, the much despised Bracken; its quick spreading rhizomous root system stabilises ash (fired) ground, soaking up the soluble nutrients before they are leached, preventing erosion and building up the humus with its copious fronds which die off each season. It is assisted in its spread by being unpalatable to animals. Large pure Bracken stands provide little food for browsing animals so animals go elsewhere and tree seedlings get established (except for light demanding species such as most Eucalypts) in a moist, sheltered, frost-free environment. Being fairly light demanding itself, Bracken dwindles to a few scattered fronds in a well developed forest. Sounds ideal! Of course it is a great fuel accumulator, so although its very growth leads to its elimination, it plays at encouraging fire which will regenerate it. Only natural!

How about Silver Wattle? It comes up after fires too, but also germinates under established Bracken or even in pasture. In the native ecology it can be placed between Bracken and Eucalypts (the Eucalypts always regenerate at the same time as the Acacias but eventually succeed them) but this tree is very versatile in form, habitat and relationships. It is a nitrogen fixer and builds up the humus very quickly. Fast grower? I've seen it 20m high at 10 years old on deep moist clay-loams in the Huon, which rivals any of the world's "weed" trees such as pines and poplars. The Silver Wattle flowers profusely, is a source of pollen for bees and sets seed in huge quantities, which can lie dormant in the soil for years until required to burst into life through some disturbance.

And the Blackberry; that introduced noxious weed of which, Baron von Mueller said in 1895, "deserves to be naturalised on the rivulets of any range". This spiny bramble controls erosion, especially along streams which have been destabilised by land clearing in the head waters. It has deep roots and is partially deciduous acting as a nutrient pump bringing minerals back to the surface, depositing them as humus. It is excellent bee forage and supports large populations of blackbirds which while eating your strawberries, distribute tons of high phosphate fertiliser. The old log heaps covered with blackberry usually have soil incomparably better than the surrounding ground. It is said that nothing grows under this weed. Most natives species are light demanding, but if suitable seed sources are present (eg. native Pittosporum or introduced Elderberry) and rabbit populations are not excessive, then vast areas of brambles will return to mixed forest.

Nature seems set on turning everything into forest; the ideal natural state. So in clearing land we take on a battle which we must consider carefully in case we bite off more than we can chew. Most of the weed problems in the Australian landscape are due to this mistake. More land was cleared than could be effectively managed by the people available. Economic downturns caused people to abandon land for long periods and when they returned (or someone else did) it was head high in blackberries. Typically the people blamed the plants.