In the 1970s when Bill Mollison and I began working on the concept of permaculture, we recognised local and global biodiversity as a treasure trove of biological wealth that could be combined to create designed ecologies for sustaining humanity beyond the fossil fuel era. In Australia, the paucity of cultivated indigenous plants and valued native animals, was the context in which we highlighted the potential of native plants and animals as integral to permaculture.

As permaculture mushroomed in the context of the 1970s energy crises and back-to-the-land self sufficiency, one of the most surprising critiques of the concept was from a small network of botanists and environmental activists promoting the idea that no plants capable of spreading should be grown, anywhere! (At the same time, these activists accepted that agriculture would continue to feed us with foreign species maintained with industrial inputs.) The serious suggestion that permaculture was potentially one of the greatest threats to global biodiversity, because of its focus on using a larger, rather than a smaller, range of species to support humanity, seemed remarkably similar to disputes between various schools of Marxism in the 1960s.

Over the following three decades, this ideology of demonising spreading species as a threat to biodiversity (on a scale rivaling climate change) took over the mainstream of environmental activism and the biological sciences, especially in the English-speaking world. Scientific research papers rebranding spreading species as “invasives” (or in Australia, “environmental weeds”)

burgeoned, filling peer review journals. The correct botanical (and emotionally neutral) term “naturalization” was abandoned because it recognized the validity of the process by which species become native to a new place.

This new science of “Invasion ecology” informed the education of a cadre of natural resource management professionals, supported by taxpayer funds. These resources mobilised armies of volunteers in a ‘war on weeds’. But labour and even machine intensive methods of weed control were soon sidelined in favour of herbicides that environmentalists and ecologists accepted as a necessary evil in the vain hope of winning the war against an endless array of newly naturalizing species. For the chemical corporations this new and rapidly expanding market began to rival the use of herbicides by farmers, with almost unlimited growth potential, so long as the taxpayer remained convinced that the war on weeds constituted looking after the environment. In Australia the visionary grassroots Landcare movement, started by farmers in the early 1980s, was reduced to being the vehicle for implementing this war on weeds.

The criticism of permaculture by the environmental orthodoxy was not due to the scale of any real impacts of permaculture but more because of the perceived audacity of using ecological arguments to justify both the use of a wider range of species, not indigenous to a site or even a bioregion. Permaculture practitioners were mostly doing little more than attempting to maintain the lineage of agricultural and horticultural research into

promising species, as governments beguiled by economic rationalism abandoned their responsibilities to invest in economic botanical research. Most permaculture teachers and designers accepted the findings of invasion ecology at face value and sought to minimise risks of unintended naturalisation.

For me this pragmatic accommodation drove permaculture away from the principle of working with rather than against nature. My own interest in abandoned gardens, arboreta and rewilded farms and urban places, as a source of permaculture inspiration was intensified through working with planner and resource ecologist Haikai Tane in New Zealand in 1979 and 1984. We coined the term “ecosynthesis” to describe the relatively rapid restoration of ecosystem function that we saw in the recombinant mixtures of native and foreign species that colonised abandoned landscapes. We also recognised how this process was generating new resources that could support human populations beyond the fossil fuel era. Further, we recognised that these novel ecosystems were the best models for the design of intensively managed human settlements. Beyond this, Tane branded the war against naturalising species as Nativism, an ideology that sought to separate nature into good and bad species according to some fixed historical reference.

As Orion makes clear in this excellent review of the application of invasion ecology to the practice of ecological restoration, much of the dysfunction can be traced back to the triumph of reductionism over more

holistic systems approach in the biological sciences. It is a great irony that ecology, the scientific discipline that was founded on holistic understanding, was overwhelmed by reductionism in the 1980s.
This coincided with the flow of cheap oil from the Alaskan North Slope and the North Sea, the dismissal of the inconvenient truth of the “Limits to Growth”, the rise of economic rationalism, and the demonising of the counter culture, all aspects of the Thatcherite Reaganite revolution that spread from the Anglo-American countries in the 1980s.

My experience in articulating ecological arguments that naturalisation of species could maintain and rebuild ecosystem services, seemed like reputational suicide amongst environmentalists and ecologists. Pointing out that our views were in line with the UN biodiversity convention (1992) didn’t help (even though it recognizes the validity of conserving biodiversity wherever species are wild). Even the more modest case, that major efforts at removal of established species would do more harm than good were dismissed.

It was not until the turn of the millennium with the aid of the Internet, that I became aware of the growing numbers of ecologists who were questioning this orthodoxy. In the book *Invasion Biology: Critique of a Pseudoscience (2003)* independent Californian naturalist David Theodoropoulos went further, claiming that the spread of species in a rapidly changing world would do more to conserve biodiversity than the massive efforts to reverse naturalisations and protect species in collapsing niches.

Since then a growing body of peer reviewed research in the field of what is now called “novel ecosytems research” is providing the evidence towards a tipping point that may reform the field of invasion ecology. I believe abandoning emotionally loaded and unscientific terms such as “invasive” and “weed” will be a symbolic and necessary step in the process. Those driving the restoration industry (primarily in affluent countries) are mostly yet to recognise the shift in the science, or the leakage of disillusioned restoration professionals who have responded to the bizarre contradictions in the practice of restoration ecology by adopting more holistic responses to ecological disturbance and species naturalisations, such as permaculture. In this way the industry is progressively losing its most motivated and ethical practitioners.

I see the importance of Orion’s book as threefold. The book traces the story of how well-intentioned concerns about biodiversity loss and ecological change were captured and corrupted by corporations selling chemical solutions to the perceived problem of “invasive species”. Using measured language and open questions Orion allows the ordinary reader to judge this process. A gathering body of evidence against the scale of chemical interventions in both agriculture and wild nature is fuelling a battle of geopolitical proportions. In the process of asking the questions about how best to restore nature, Orion exposes a deep ethical corruption at the heart of both ecological science and the environmental movement.

Perhaps more fundamentally the author's personal experience as a dedicated and innovative restoration practitioner, speaking directly to both her peers and the general public in a reflective tone, provides a great model that can help all of us move further along that long winding road of learning how to work with nature rather than against her.

Finally, as the baby boomers who rode the first wave of modern environmentalism fade from the scene, I find it significant that it is a young woman who provides the hope that environmentalism having lost it's way through a futile and destructive war against nature, can return to the path we collectively lost.