

ENTER AUSTRALIAN APPLIED ECOLOGY

“Australian ecology emerged from a background of ‘empire science’ which began with the sciences of ‘exploration’: ‘the astronomy of the southern skies; geophysics ... and natural history. Natural resource benefits were important to the economics of empire ... Conservation science which emerged later, still incorporated the imperial traditions.”

— LIBBY ROBIN, *ECOLOGY: A SCIENCE OF EMPIRE?*

“There is little convincing evidence of substantial damage by kangaroos to crops, pastoral production or rangelands, except in a few localized areas.”

— OLSEN P AND LOW T, *UPDATE ON CURRENT STATE OF SCIENTIFIC
KNOWLEDGE ON KANGAROOS IN THE ENVIRONMENT*

In 2002, a group of conservation biologists and applied ecologists gathered to consider a different national direction for kangaroo killing. Building on the framework that had moved kangaroos from economic pest to commercial and export resource, many doubled down on the idea that farming of kangaroos would be a win for conservation of the animals, the bank accounts of farmers, and the rehabilitation of the countryside.

However, veteran ecologist Harry Recher wasn't impressed. Armed with a less 'applied' ecological perspective, he told the assembled kangaroo experts:

“Suggestions that Australia can advance the conservation of native fauna by encouraging people to keep native animals as pets and have pastoralists replace sheep and cattle with kangaroos are not revolutionary. As with the preoccupation of environmentalists with endangered species, national parks and wilderness, these are limited options which will achieve little in the way of conserving Australia’s flora and fauna. It is far more important to end land clearing and habitat fragmentation in terrestrial environments and to cease building dams, diverting rivers and trawling for fish in aquatic environments.”

Not much changed. Seventeen years later came the Darling River catastrophe, marked by a million dead fish, dying terrestrial wildlife, and a shattered ecosystem, reflecting Australia’s continuing exploitative path to benefit export agriculture.

Staying with the kangaroo story, ideas about substituting kangaroos as meat ‘product’ to replace sheep and thus take the pressure off Australia’s degraded grazing lands had been floated within Australian conservation biology since 1988. It wasn’t making much headway – more for practical than ecological or ethical reasons. The notion of farming kangaroos was laughed at by the farming community, and rejected by biologists and veterinarians who understand kangaroo physiology and trauma response to confinement. Add to that the vast numbers of kangaroos needed to yield equivalent meat.

An early proponent of this solution was Gordon Grigg from the University of Queensland – a leading voice on Australian kangaroo management and adviser to governments under the conservation biology banner (a subset of zoology studies often taught as applied ecology). Grigg was joined by some of his former PhD students as well as like-minded conservation biologists from other universities and the Australian Museum. A pulpit for the ideas of conservation biology has been the Royal Zoological Society of NSW. Here are

dominant voices on managing common Australian wildlife, particularly on what to do with kangaroos or how to count their numbers.

The 2002 conference where Harry Recher spoke focused on discussion around the theme 'using native fauna to assist in its own survival'. The logic of this theme was as follows: that after two centuries of sheep grazing depredations and macropod persecution, the kangaroo should save its own species, the countryside, and the graziers by dying for petfood, skins, and 'jump steak' in a more organised and commercial fashion.¹

In this vein, when a 2004 book, *Going Native*, by palaeontologist Michael Archer (best known for his quest to clone the extinct thylacine) and journalist Bob Beale, was reviewed by a Sydney Greens party member, she quickly announced that she ate kangaroo, regularly. And so should the reader. Why?

She had bought the argument that Australians should farm and consume kangaroo in order to save the clapped-out, semi-arid rangelands from total ecological collapse after 250 years of European pastoral management. On the book's back cover, I read that returning to Australian nature as it advocates, includes "the massive health and environmental benefits to be gained from harvesting kangaroos".

The argument was further amplified by media articles and was soon picked up by the kangaroo industry which had been ploughing money into public relations and market research, co-funded by the federal government through the Rural Industries Research and Development Corporation.

The 'trust us, we're scientists' strategy had become a rewarding path to counter public interest arguments, pioneered by the tobacco industry and picked up by logging and other resource battles and prominent in the global warming/climate change 'debate' as conducted by the fossil fuel industry.

Thus a 2005 *Sydney Morning Herald* article reported on an

industry consensus that in order to get Australians to eat the national symbol the industry had to overcome the ‘Skippy syndrome’. A good way to do that, John Kelly, Executive Officer of the Kangaroo Industries Association of Australia told reporter Daniel Lewis, was for Australians to learn that prominent scientists such as Mike Archer and Tim Flannery (who had worked with Archer at the Australian Museum) promoted eating kangaroo meat as a way to save Australian ecosystems. The industry’s website at the time reportedly did just that.²

However, Lewis was even-handed in covering the mantle of science that has obscured the nasty realities of Australia’s wildlife killing habits. So, at a book launch for *Kangaroos Myths and Realities* he interviewed macropod biologist David Croft. Croft, like Archer, held a research position at the University of NSW at the time. Croft studied Red kangaroos at the university’s Fowlers Gap station in the rangelands north of Broken Hill where there were certainly ecosystems under stress. He told the reporter the notion of eating kangaroo to save the environment was “complete bunkum”.

Croft pointed out that pastoralists had not been destocking, and that their view of kangaroos as ‘vermin’ to be removed often put them at odds with the goals of the commercial industry which would need sustained ‘product’. Croft, as noted earlier, has been a long-time advocate of turning the rural pastoral economy towards ecotourism to safeguard the remaining wildlife and offset destocking. He told Lewis that kangaroos “authenticate the whole experience of being Australian and the animals should be visible on every roadside untroubled by a barbaric industry”.

In the same year, the national quota of kangaroos that state governments were offering to be killed was 3.9 million – not including the collateral deaths of millions of joeys. While quotas are never exhausted, numbers of that order had annually yielded 5000 – 6000 tonnes of kangaroo meat for petfood and sausages,

and up to two million skins used for soccer shoes and other leather products, for annual export. And that was just the legal market.

SCIENTIST PRESCRIPTION MEETS RURAL SCEPTICISM

Looking through more recent newspaper accounts, I saw this industry idea had not died and instead had gained new spokespeople amongst applied ecologists. They have diverted from the idea that kangaroos can be farmed, to double down on commercial harvesting as the way to extend on-farm income and maybe effect some soil conservation. The sub-text is that the wildlife is the property of the landholders.

One of these science voices, often tapped by media and government, is British Isles-trained zoologist and veterinarian George Wilson. Wilson, according to his company's website, has enjoyed a revolving door between academe, industry and government work with experience in Australian applied wildlife management.

A 2014 rural newspaper story featured Wilson promoting commercial hunting at a central Queensland grazier (AgForce) meeting. This was worth a look because of the arguments Wilson made and those he encountered when graziers were asked to mentally shift kangaroos from pest to valuable 'resource' (pointing to other countries with large native herbivores). In this scenario the resource is for hunting and killing, not ecotourism.

The reporter started her account with the ubiquitous claim that Australia had "out-of-control kangaroo populations". She noted that viewing kangaroos as valuable in any way whatsoever "was a topic that was always bound to be controversial – the kangaroo is widely viewed as a menace that is ruining properties and needs to be removed at all costs".

The story cited Queensland's purported 32 million kangaroos in 2013, itself a controversial claim, and the potential dollar income to graziers from a 'harvest' as proposed by Wilson. The rejoinder

from the audience was that graziers had no confidence that the despised kangaroo would ever be more than pet food. Wilson expressed astonishment at the hatred people directed towards the national icon.³

Five years later, Wilson was still promoting the win-win “humane” kangaroo harvesting industry. If graziers actively cooperated in taking kangaroo meat and skins for profit, they would value the animals, while controlling those alleged rampant numbers. Pointing to these advantages in 2019, he argued that amateur hunters were cruelly killing kangaroos and erecting fences on behalf of graziers. This is true. Therefore, better to leave management in the hands of the commercial industry, he argued. With his Australian National University zoology researcher hat on, Wilson enjoyed a series of national media stories promoting this idea. As commonly the case with Australian media stories about the alleged need to manage kangaroos to help the farmers, there were little to no balancing perspectives.

WILDLIFE SCIENCE AND A SINGULAR MESSAGE

In February 2019 a five-minute documentary drew anger from kangaroo defenders, while being vigorously applauded by right-wing Australian media figures and reported uncritically by other Australian media. The documentary featured credentialed ecologists promoting the same ideas as Wilson’s and indeed the film was given his public support. Titled *Australia’s Shame*, it was executive produced by two South Australian ecologists. I looked them up and found they also enjoy a revolving door between academe and consultancy in wildlife science.

The shame they were exposing was that ‘too many’ kangaroos existed and were not being saved from starvation by pre-emptive death, which would also save public or Indigenous land and other native flora, fauna from the native grazers’ alleged impacts.⁴

As a scientific effort, numerous variables affecting the state of

the wildlife were not discussed when considering Australia's shame. Those might have included extensive habitat conversion and exclusion, influence of the weather on populations, and the whole panoply of colonial and post-colonial destruction of Australia's biodiversity and specifically of kangaroo species. Or that starvation is the natural end for all kangaroos as it is for other grazers as they lose their teeth.

The film's ecologists made sweeping national claims and judgments. But what viewers saw was a narrow slice of South Australia's arid zone and cleared mallee land where these researchers worked to save some now endangered species on degraded soils during dry times.

The remedy prescribed here as ever was "management". Australians should eat more kangaroo meat (as a welfare gesture?), and at the same time revive a flagging commercial kangaroo product industry. Kangaroos would be saved not only from death by starvation but from death by grazer culling. The welfare/professional management narrative did not mention that the industry had shot out many eastern 'harvest zones' at the level of commercial viability since the 1960s. As this film was released, South Australian-based Macro Meats, the leading commercial processor and exporter, was reportedly exhorting landholders to pick up the phone and get a killing license that easily and the state was considering new shooting zones.

The arguments made by the scientists in these examples fit a long-standing pattern of values in the field of applied ecology and wildlife management in Australia. The brief is to benefit the agricultural and commercial sector. Perceived wildlife abundance supports calls for lethal management and commercial exploitation. I was reminded again of the koala story.

Ironically for me, as someone who wrote a book exploring Australia's climate change uncertainty since the 1980s – as a

mainstream science narrative was being sniped at by a cohort of contrarian scientists, in the Australian native wildlife management arena the opposite has been the case. The undisputed mainstream of the science has over time provided arguments for the killing and exploitation of the public's wildlife to benefit commercial interests, with little to no public input.

The contrarian voices here are those advocating a less lethal, more compassionate and purely ecological approach to Australia's unique animals and their necessary habitat. That is those animals not already labelled endangered. Scientists and animal welfare voices who advocate compassionate and non-lethal values and methods have been marginalised and framed as less valid than the rational, traditional (and loud) mainstream.

All environmental decisions are at root cultural and values-based. Millions of 'common' native animals lose their life in the name of commerce and development every year. In the case of kangaroos, the commercial 'harvest' has no more convincing scientific or cultural reasons than those advanced for clubbing baby seals in Canada or harpooning whales by the Japanese and Norwegians.

Which brings me back to applied ecology and its influential advice. Gordon Grigg for example wrote in 2002 that kangaroos 'exploding' in abundance since settlement is a given that everyone understands without need for evidence or detailed geographic qualification. "A small number of species of large kangaroos – the Red Kangaroo *Macropus rufus*, Eastern Grey Kangaroo *M. giganteus* and Western Grey Kangaroo *M. fuliginosus* in particular – have increased markedly in abundance," he wrote. These happen to be the surviving large kangaroos that are the target of commercialisation.

"They are present in vast numbers in many parts of Australia's arid and semi-arid sheep rangelands, a mostly degraded area occupying about 40 percent of the continent, where they coexist

with about 15 percent of the nation's sheep flock.” Grigg added that sheep graziers are now often adding goats to the production mix, which will do nothing to lessen land degradation.⁵

The vast millions narrative is regularly amplified with government population counts for the commercial ‘harvest’ The methods were devised by applied conservation biology mainstream practitioners. But national kangaroo totals gained from surveying harvest zones that blanket the states, raise valid questions of how indeed they get their totals while annual numbers jump around dramatically and increase to fantastic levels even during drought. I drill into that question in a later chapter.

EMPIRE SCIENCE SPAWNED SCIENCE FOR DEVELOPMENT

Development-focused nature research and a specialised understanding of ecology has a long history in Australia as in South Africa and North America. The biological sciences were put to the service of development and ‘progress’ and commercial gain in the British colonies. History shows us why there are no baseline ecological studies, unencumbered with ideas of ‘management’ or commercial use, for many of Australia's common native species.

At the same time, modern European countries and their colonies evolved with respect for expert knowledge. What scientists say matters and the context of a narrowly-focused academic field can get lost. In the case of kangaroos, when applied ecologists say that some kangaroos persist in vast millions and populations “explode” from time to time, governments and the media listen.

Conservation biology/applied ecology hang off the broader fields of zoology, botany and population biology. Wildlife management to pave the way for development has been a traditional brief for applied ecology as practiced in Australia.

Since the British dispossessed native peoples and native species and established the private property rights culture, wildlife

populations – from the dingo to the kangaroo species, not sparing birds including emus, brolgas, raptors and large parrots, possums, wombats and flying foxes, have been subject to lethal management for agriculture and development on private and sometimes public land. Native vegetation and therefore habitat receive similar management.

Zoologist David Croft, who has long stood in somewhat lonely public opposition to parts of this discipline, told me that before he introduced the seemingly radical idea of wildlife tourism for Australia “95 percent of conference papers were about killing things”.

CONQUEST BY INTRODUCED SPECIES

Environmental historians point out that the colonisation of Australia was accomplished not just by humans but by a whole zoo that would take precedence over the natural landscape and animals and that needed biologists to consult on the “acclimatisation”, as this invasion was called.

Along with sheep and cattle, came pet animals including the rabbit and the cat, hunting accessories the fox and the hunting dog, crops and ornamental species of plants and, most effective in overcoming human opposition, the microbes that hitched a ride including smallpox, syphilis and influenza.

Today’s CSIRO (Commonwealth Scientific and Industrial Research Organization) was established post WWI to support primary industry in Australia and applied biology was central to its mission to foster development, writes historian Libby Robin in *Ecology: a science of empire?*⁶ Established in 1926, the Empire Marketing Board as it was called (no, we’re not channelling Star Wars) had a big hand in supporting early applied research and early ecology research of the CSIR as it was then called.

Australia’s understanding of applied ecology started with agricultural and pastoral pests. While this description refers to

corralling escaped introduced plants like the prickly pear and animals, particularly the rabbit, native animals would soon come under the same frame.

There was not then, and inadequately since, an Australian scientific focus, with no dollar signs attached, on the ecology and interconnection of native species for baseline understanding. Except when those species are almost gone and labelled 'endangered', and 'management' is kicked into high gear on their behalf.

Australia's early biologists and CSIRO heads were British-trained through Oxford University, a world leader in applied ecology. This established a shared value structure for the colonies: that applied biological sciences were to be handmaidens to late empire visions of colonial development in agriculture and forestry and that inconvenient natives as a matter of course would be removed. Still, valuable insights into the nature of Australia were gained.

A MAVERICK OF EMPIRE SCIENCE

Biologist Francis Ratcliffe, while of this background, proved more independent in his thinking. He was sent to Australia by the Empire Marketing Board in 1929 to study the biology of the 'fruit bat', flying foxes, which had been labelled a major pest by east coast horticulturalists who wanted to eradicate the species entirely. Ratcliffe persuaded them that this was not necessary as only a few animals caused problems.

He conducted pioneering work on soil erosion, documenting erosion with sheep grazing on boom and bust marginal country. He also thought long and hard about those inland sheep enterprises that to this day spearhead the demonization of native grazers like the kangaroo and emu, rather than considering the basic sustainability of the enterprise in that landscape.

Similar to the reception of Marshall, Auty or Croft in later years, Ratcliffe's conclusion about sheep grazing in inland Australia was not welcomed. "The essential features of white pastoral settlement – a stable home, a circumscribed area of land, and a flock or herd maintained on this land year-in and year-out – are a heritage of the reliable, kindly climate of Europe. In the drought-risky semi-desert Australian inland they tend to make settlement self-destructive," he wrote.⁷

The choices have not changed from the 1930s droughts examined by Ratcliffe: if the graziers meet the inevitable droughts by destocking, they lose their investment and their breeding programs. If they don't, they ruin the land.

Ratcliffe's pioneering ecology career in Australia extended to being a key founder of the Australian Conservation Foundation (ACF) in 1965 with the idea that science and ecology were basic to native species conservation.

Historian Libby Robin, expanding on the theme that ecology in Australia was established to introduce and acclimatise non indigenous species to benefit 'the national needs,' concluded that Western thinking within the sciences has been "deeply imperial". Only recently have some biologists started to work cooperatively with Australia's first people to better understand how to live in the unique environments of the country.⁸

Thus, an empire-directed science helped embed a white, European, property-owning class dictating political agendas and ideas about the natural environment. Christian notions of superiority and dominion over nature played a role. Zoos, botanic gardens, and collecting animals and plants, soon to be dead, captured the post-Victorian ideas on nature in the colonies.

CULTURAL BEDROCK

Settler culture morphed to Australian culture, and the same values and beliefs inevitably inhabit many of the scientists who grew up in the culture. What they inherited was imperial dedication to making introduced agricultural species flourish, joined to traditional and colonial ideas about game management and pest management.

From Jock Marshall and those who wrote chapters in his book I had already learned that no scientific studies were undertaken prior to eradication of plants and animals in the new colony. Few original ecosystems were put into reserves before the 1960s. Habitat for animals disappeared along with the plants and trees.

Even Ratcliffe, who was hired by the CSIRO in 1949 to become the first Officer-in-Charge of the Wildlife Survey Section, had to acknowledge little progress eight years later. He noted his department, distracted to deal with the issues of rabbits, had not been able to amass baseline data on the status and distribution of native wildlife nor the biological adequacy of parks and reserves. A survey of marsupials in NSW was the sum of it.

Opinions and assumptions along the lines of ‘We’ve never had so many kangaroos in Australia because they have prospered with our improvements’ have filled the void since. Without the early science, the next best evidence on that claim is historical observation and the accounts of explorers and settlers, which document a rich and diverse fauna and landscape, as I described earlier.

WHAT DO NATIVE ANIMALS DO IN THEIR ECOSYSTEMS?

My next question was: what contemporary studies were available on the ecological role of Australia’s unique macropods, wombats, dingos, bats, possums, and other common and often persecuted natives?

Still today, the quest leads outside what is considered the mainstream of Australian wildlife research. A small band of

newer-generation field ecologists – which includes David Croft, Daniel Ramp, Dror Ben-Ami, Ray Mjadwesch, and Arian Wallach, all who have helped my investigations – say that there is little to no funding for basic ecological research on the ecosystem functions of the surviving common Australia native wildlife, as if there is no role that matters.

These ecologists have testified that kangaroos, like other native grazers, are keystone species in the landscape, whose grazing, under natural conditions, is matched to the needs of other animals throughout the grassland structure – in other words, a true ecological analysis. The nutrient cycling or the native grass seed dispersal role of native grazers is also known from observations, often by people living on the land.

The 2020 ABC natural history program *Australia Remastered*, is worth a mention here for its stunning resurrected documentary footage and intimate home visits with Australia native species. An updated narrative recognises the ecological role of some of the persecuted natives. Wombats, for example, are recognised as essential ecosystem engineers for the grasslands and woodlands they share with other Australian wildlife.

Yet it is not uncommon, as I have witnessed over the years, that the biologists who defend an ecological role for kangaroos in particular but also for dingos and other inconvenient species, or who argue against lethal management, are attacked by mainstream practitioners and have had their evidence discounted and credentials dismissed in legal challenges.

IT'S COME TO THIS: KANGAROOS OUTSIDE OF BIODIVERSITY

With this kind of science history background and their mission to manage kangaroo populations, the Australian Capital Territory applied ecology fraternity and parks bureaucracy began promoting an amazing idea as fact. The idea became justification for the

territory's controversial annual 'cull' of Eastern Grey kangaroos. It has been repeated without question in media reports domestic and international and has spread to other public land-management agencies in southern Australia.

The narrative is that these large kangaroos should be treated as something apart from Australian native biodiversity and are indeed a threat to biodiversity. This frame further strips the animals of already meagre legal protections as 'protected native species' and justifies overriding previous guidelines against killing females. The proponents in Canberra of a government cull offer a list of endangered species that they claim, offering no compelling evidence, are threatened by kangaroos.

How applied ecologists in the ACT go about demonstrating that kangaroos are damaging the surrounding environment is revealing: they rely on measuring grass height and mass as a 'surrogate' for measuring healthy biodiversity. (Even a non-expert may suspect the web of life is a bit more complicated than that.) In this scientific method, tall grass is good, and grass grazed down by kangaroos is bad – on paper anyway.

The natural native grass contours – in many areas dominated by tussock species – is a mix of taller and grazed down. The grasses and tussocks have evolved to regrow. Fifty years ago, CSIRO's Harry Frith wrote that kangaroos do not damage their environment but know when to move on, unless confined.⁹

The spread of the novel idea that kangaroos are outside of biodiversity was illustrated in the February 2017 appearance of two articles from the UK media, both from serious, respected outlets – the BBC online and *The Independent*. Each led with a statement that Australia was about to 'cull' a million kangaroos – "to protect endangered grasslands and wildlife" according to the BBC version.

The English media turned for expertise to a research program at the Australian National University Fenner School of Environment

and Society. In the BBC article, Fenner's highly-published Professor David Lindenmayer discusses the need to kill kangaroos (apparently the number 'one million' did not faze him). The article illustrates a foreigner's confused uptake of 'facts' accompanying Australia's kangaroo killing programs. Lindenmayer is quoted as saying that it was necessary and people are still too squeamish on the topic of eating Skippy – that the cull was to save ecosystems and endangered species. (The millions already killed commercially did not rate a mention in these reports.)

The professor is quoted as implying the critically-endangered Leadbeaters possum that lives in trees in the Mountain Ash forests of Victoria is a victim of the kangaroos. He doesn't explain how that could be, and it seems a British journalist did not ask. Fire and logging of the possum's old-growth forest habitat do get a mention. A logical person might suspect they are the true threats.¹⁰

Frequently offered as evidence of the kangaroo danger has been an academic research report by a former Australian Capital Territory government employee. This paper is said to show that kangaroos threaten native reptiles. Its co-author was the government ecologist who first devised the Canberra kangaroo cull on public reserves, as well as Professor Lindenmayer as program leader.

I had looked at that research, as did others who can read an academic report. There was no data involving actual kangaroos, or direct evidence of their impacts, in the rise and fall of reptile populations studied. That did not stop the authors from actively claiming this paper proved kangaroo damage, seemingly guided by an assumption of unacceptable kangaroo number in the vicinity (basically a long-time average number for the regional landscape). The study was offered as conclusive evidence by not only the ACT government but by outside organisations that proposed to thin kangaroo populations claiming to save biodiversity.¹¹

Five years after this paper was published, international studies emerged warning that pesticide use, loss of habitat and climate disruption were decimating global insect populations at catastrophic levels. Insect loss would endanger pollination, nutrient recycling, soil health and food for other species like insect-dependent birds, mammals and reptiles. Varying weather and the state of insects were variables not controlled for in the ANU Fenner School reptile study that relied on comparing grass height and wanted to blame kangaroos for reptile declines.¹²

CONSERVATION BIOLOGY AUSTRALIAN AND US STYLE

One of the few academic analyses of conservation biology as it is practiced can be found in the *Stanford Encyclopedia of Philosophy* (both 2004 and 2014 editions). I learned that “Conservation biology emerged as an organized academic discipline in the United States in the 1980s though much of its theoretical framework was originally developed in Australia. Significant differences of approach in the two traditions were resolved in the late 1990s through the formulation of a consensus framework for the design and adaptive management of conservation area networks.”

What emerged in this discipline is a largely desk-bound biology with some useful jargon like ‘adaptive management,’ focused on modelling hypothetical cases for areas that require conservation planning. Computer algorithms trumped field biology. Animals in such a system are units, not living beings with families and social organisation. Some people called such modelling ‘playing God’.

The Australian version that evolved is described as radically different to the early ecological and ethical scope of the US version that started in the late 1980s. That was led by scientists like Jared Diamond, E.O. Wilson, Michael Soule, Paul Ehrlich, and Thomas Lovejoy. Soule wrote in 1985 of what he thought would be basic to conservation biology: “In emphasizing the inherent value of

nonhuman life, [the perspective is that]: Species have value in themselves, a value neither conferred nor revocable, but springing from a species' long evolutionary heritage and potential or even from the mere fact of its existence."¹³

The Australian variant on the other hand was focused on active species management: completing that imperial project of converting wild country and serving the agriculture that replaced it – a process dubbed “habitat conversion”.

The *Stanford* analysis notes that Australian conservation biology has been the handmaiden of cultural values, “socio political factors,” and priorities from inception – as in, handmaiden to the values and priorities of colonial settlement – transforming the existing environment, its fauna and flora, for European and British-style farming, introduced species and economic gain.

1080: POSTER CHILD OF CONSERVATION BIOLOGY, AUSTRALIA AND NEW ZEALAND

The lethal approach to effecting conservation biology goals has been accepted as a primary environmental management tool in both Australia and New Zealand. These two former colonies are world champions and still-holdouts in poisoning animals with 1080 baits, often dispersed from the air.

In both countries, killing millions of introduced animals once they are labelled as ‘pests’ (for example, Australian Brush-tail possums in New Zealand) raises even less debate than killing indigenous wildlife. The practitioners of pest animal eradication and wildlife management of anything not labelled ‘endangered’ frequently blur. The notion of abundance and tag of ‘pest’ is all that is needed.¹⁴

In Australian sheep country, 1080-laced baits are often dropped from aircraft. One example is dispersal in a four kilometre-wide transect of country bordering the ‘dog fence’ that stretches for

5,600 kilometres (3,500 miles) between the north and the south of the continent.

While the target is dingos and wild dogs, no one knows the total impact, including persistence in the environment, secondary poisoning of scavenger birds or, elsewhere, mammalian native predators. The poison is dropped by government departments on behalf of sheep graziers. Regular government poisoning is conducted on the outskirts of national parks for the same reason.

In the state of Tasmania, industry and government are united, although not necessarily with the public, on the need to poison-bait Brush-tail possums, and poison or shotgun Pademelons and Bennett's (Red-necked) wallabies that nibble on emerging trees shoots.

Developed as a rat poison – therefore a mammalian poison – from a naturally-occurring plant metabolite, 1080 is now tightly controlled or banned in most countries because of its hideous method of dealing death, along with its variable persistence and danger to non-target species, including carrion feeders. The use of this poison as a wide-ranging control method, targeting for a long time now the Australian native dog the dingo (as well as escaped domestic dogs, foxes, cats, pigs, rabbits, and possums) is, simply put, an animal welfare issue.

Most animals that ingest it will die – and worse, they will suffer horribly for up to 48 hours or longer before they die. In dogs, the signs of poisoning are usually noticed within half an hour of ingestion, but can take more than six hours to show up. First symptoms include vomiting, anxiety, disorientation, and shaking. These quickly develop into frenzied behaviour with running and screaming fits, drooling at the mouth, uncontrolled paddling and seizures, followed by total collapse and death.¹⁵

NSW BLANKETS BURNED FORESTS WITH POISON



Photo: Maria Taylor

Native carnivorous forest dweller, the quoll.

The NSW Animal Justice Party published further facts about 1080, as NSW started what it was proud to call its “largest feral animal control program in the state’s history” following the 2019–2020 catastrophic bushfires. This involved dropping poison baits disguised as food for hungry mammalian animals into 60,000 kilometres of the state’s burned-out forests over a 12-month period.

Any animal, states the AJP in an available fact sheet, including humans that ingest 1080 will die a slow, painful death. There is no antidote. The toxin also causes birth defects and reduced fertility, as

well as damage to the reproductive system, brain, heart and other organs. It works by preventing the body's muscles and organs from absorbing energy, resulting in cramps and failure of the lungs and heart, with a death typically lasting between 8–24 hours for birds and 2–4 days for large mammals.

The possibility of poisoning native non-target species like the endangered marsupial carnivore quoll, ground-digging rat-kangaroos like Potoroos, or omnivorous birds, is strenuously denied by government authorities. People who protest are told that most marsupials are immune to the poison (except, it seems, the possums that are regularly poisoned in New Zealand and poisoned in Tasmania along with the wallabies).

The Animal Justice Party quotes research indicating that Potoroos are more susceptible to 1080 than introduced rabbits. Localised extinctions of Tiger quolls were linked to 1080 baiting 20 years ago when politicians were informed by a government Threatened Species Scientific Committee. And yet, nothing changes. The AJP is under no illusion that lobbying by sheep farmers isn't related to this toxic warfare, noting there are alternative ways to ward off foxes and dogs.¹⁶

DESKTOP FORMULA TO KILL VERTEBRATE 'PESTS', AND THE NEED FOR PUBLIC PERSUASION

Budget cuts and thinning park service ranks, and a desk jockey approach to ecology have played into the automatic reach for gun and poison as land management tools. Twenty years ago, a conference organised by the Australasian Vertebrate Pest sector discussed the challenges of bringing the public along with killing as the preferred management tool working to a formula. They canvassed the best ways to kill rabbits, goats, pigs, dogs and horses, as well as kangaroos in the South Australian Flinders Ranges national park.

They had a plan to reverse years of introduced stock damage. The plan was to cull Red kangaroos and Wallaroos/Euros down to two and 10 animals respectively per square kilometre, i.e. per 100 hectares (250 acres). These theoretically acceptable numbers, along with culling goats and rabbits, underpinned a desktop formula they developed of ‘total grazing pressure’ treating social animals as statistical units.¹⁷

The government scientists compared what they considered alarmingly high macropod numbers in the park (sampled at five Red kangaroos per square kilometre and possibly 10 Wallaroos/Euros) with more acceptable numbers on surrounding pastoral land, “where there is competition from grazing stock and commercial kangaroo harvests are undertaken opportunistically”.

The agenda here, as with the suggestion of farming kangaroos to replace sheep on grazing properties, was recovery of native vegetation and sometimes ‘threatened species’ after years of stock degradation. These approaches to shield the perceived needs of vegetation and endangered species from the presence of more robust common species have also divided some Landcare affiliates and some environmental groups from wildlife and welfare advocates. An integrated ecological approach is still missing.

Few Australians are aware and might be aghast to learn, that some Australian states routinely kill wildlife, specifically macropods, in national parks. Following a period of severe drought and then bushfires in 2020, activists learned through freedom of information requests that the state of Victoria killed more than 4000 Western Grey and other kangaroos sheltering in western Victorian parks. The government had designated twice as many for destruction. This was not a new trend for Victoria. In the north of Australia, a mix of land managers have eliminated much of the terrestrial wildlife and habitat through igniting annual fires that burn too hot, too late after a wet period, and burn indiscriminately.

WE ALL THINK ALIKE

It does not take long to realise that Australian applied wildlife research is overwhelmingly conducted by agencies funded by the taxpayer. Some of it comes through the commercial-minded Rural Industries Research and Development Corporation (RIRDC). RIRDC reports can be used as science-badged promotions handed out in Australia and overseas. CSIRO applied branches have been another mainstay: lumping some native wildlife in with vertebrate pest research. Some academic departments are on board.

Meanwhile, the CSIRO's on-ground field ecology branches, which did conduct some long-term data gathering, have slowly been disbanded as the organisation moved to require more external, commercial funding to underpin research. State departments of agriculture transparently pay biologists to work on pest management for farmers.

While the claims of scientific expertise in conservation biology and wildlife management come cloaked in the conventions of scientific institutions – the conference, the journal publication, the higher degree – many of its proponents have proven less happy with the open debate convention of science.

“These people were promoting themselves as scientists but using all the tools of propaganda,” zoologist David Croft told me. “If they had a critic, particularly anyone with any animal welfare interest they were ‘animal rights people,’ they were not fellow scientists, always extremists, extreme vegetarians. Welfare is considered emotional, not scientific. It was suggested that there was a conspiracy to stop people eating meat because some people who opposed the commercial kangaroo industry were vegans.”

Ecologist John Read, who commissioned the 2019 film *Australia's Shame* about starving kangaroos was happy to repeat to me how he characterised the opposition: “Tragically, campaigning against human consumption of roo meat by a fringe minority of

ill-informed animal welfare advocates has reduced export markets and ironically reduced the capacity for kangaroo populations to be managed sustainably and ethically. Increasing our consumption of roo meat and restoring export markets will assist in ethically managing kangaroos (according to RSPCA-endorsed guidelines) rather than having them culled by amateurs or left to starve to death.”

THE PROFESSIONAL, ETHICAL, HUMANE, KANGAROO HARVEST OBSERVED

Those who promote commercial and non-commercial killing of kangaroos, counter public unease by assuring everyone the hunt is professional, ethical and humane. Most people want to believe that is so and not think about it. But observations and experience relayed by activists and disillusioned shooters, including to me for this book, have seriously questioned whether in aggregate the nightly killing today is any less brutal than in past decades. Neighbours where shooting takes place also have seen the worst.

West of the Blue Mountains in NSW, Greg Keightley and Diane Smith had almost a decade to document the commercial kangaroo harvest along three kilometres bordering their 500-acre property, bought with the idea of owning a conservation property. Three species of kangaroo exist in their area. Little did they dream of the neighbourhood nightmare they would encounter, including threats, because they are non-conforming with the ‘harvesting’ of kangaroo supported by other landholders.

“We have watched with our own eyes, and it is inherently cruel,” they wrote in 2015 to the *Sacramento Bee* newspaper in California prior to that US state’s legislative vote on resuming import of kangaroo products (it was voted down).

Night after night they witnessed trucks with bright lights shooting at and pursuing what were family groups of kangaroos.

They testify that they saw and heard many distressed animals that were wounded and not killed immediately. They have found the remains. They have seen the lost and bewildered joeys. They have documented the frequent body-shooting that is almost inevitable. They wrote in their testimony:

“We have seen hundreds of kangaroo heads that have been butchered and left in the field. Many do not have a gunshot wound to them. The heads are cut off very low down the neck indicating that the kangaroo may have been miss shot, struck by a bullet in the neck or the torso.

“We have witnessed kangaroo heads that have been shot in regions of the head other than the brain case, often in the front of the head. The animals may not have died until sometime after, often showing the signs of gruesome secondary trauma from a length of metal pipe or an axe. Joeys are often not killed with their mothers but ripped from her pouch and discarded into the bushes, not even counted as a statistical ‘kill’.

“We hear joeys calling for their dead mothers until the sun comes up. We see them in the mornings lost and bewildered. We may see them again the next evening, but usually never again after that. This is considered ‘acceptable collateral damage’.

“We often see kangaroos shot on a previous evening who died on our property while escaping the terror of being continually hunted. We see the trails of blood where the kangaroo has had her throat cut. The body is hung on the back of the truck to bleed out. We see the butchering sites where the shooters stop to ‘dress’ the kangaroo.

“The group social structure is ruined. The mob is in disarray. The fields smell of death. Such an integral part of the biodiversity of the Australian rangelands – hunted down, killed and then butchered in a dirty, dusty truck bed. Squashed into pet food cans,

or sold as sausage, or to manufacture soccer boots and gloves, or testicle key rings for tourists. It just doesn't add up."

In 2019, Greg and Diane were still documenting the hunt that disturbs their nights, even following the shooter to the chiller box. Diane is now taken up with caring for rescued joeys. Greg told me that the big male kangaroos are all gone, shot out of the area. The bodies going to the chiller boxes are all female, and small and young animals.

The remaining mob's guard is now a matriarch rather than the alpha male kangaroo. The shooters' vehicle is followed regularly by foxes that eat the decapitated heads and other discarded body parts. The couple has not seen any mainstream media outlet in Australia show interest in what really goes on Outback under cover of darkness.

One-time professional kangaroo shooter David Nicholls has written about and also spoke to me about his experiences, and the nightmares he endures from his time in the industry. He remembers the terrible wounding, the "slaughter of the innocents," the "juggernaut that was and is altering the genetic makeup of a marvellous animal," and feels he must bear part of the blame every time there is a wanton act of cruelty to kangaroos. One-time kangaroo shooter Lyn Gynther, to whom I spoke extensively about the situation in Queensland, now runs advocacy group KangaWatch and spends her days as a wildlife carer.

These voices pull the veil from the "humane" and professional hunt advocated by some applied ecologists and wildlife officials. I wonder whether the science badge has convinced the long-silent peak environmental groups and Australia's peak animal welfare organisation, the RSPCA. A spokesperson for the RSPCA hinted at how the slaughter has been rationalised. She told a reporter for *The Sydney Morning Herald* in 2016 that the commercial hunt is more acceptable because the government has set standards and someone

is overseeing the activity, so cruel practices are less likely to occur than with ad hoc shooting.¹⁸

Unfortunately, this is a delusion shared by many. No one – other than citizens who attempt to bear witness like the Keightleys or those who protest at Canberra’s government cull – oversees or monitors the nightly commercial kill, or the non-commercial slaughter on grazing properties in every state, or on public lands, barring the occasional ranger.

COMPASSIONATE CONSERVATION: A VIEW WITH ROOM TO GROW

Australia’s growing compassionate conservation scientific fraternity has more in common with the US ecological version than with mainstream Australian conservation biology.

As a founding scientist of the Australian Centre for Compassionate Conservation at the University of Technology Sydney, ecologist and wildlife biologist Dror Ben-Ami emphasises that all conservation is about values, that it just depends on the mindset and methods.

“Biology is not mathematics. If you value wildlife, the pest name does not exist. Biologists should be about love of life, not the opposite. It’s disrespect. I had the privilege of studying kangaroos for 4–5 years in the wild. Animal protection and animal rights *is* a value.”

Still, with the mainstream science firmly behind the lethal management ethos, few scientific voices enter the public conversation saying that lethal management is pointless and counterproductive – whether to boost stocking rates or to find a scapegoat for drought conditions.

One who has spoken out is dingo researcher Arian Wallach at the Centre for Compassionate Conservation. In a media landscape that faithfully amplifies a traditional narrative of ‘our poor farmers’ beset by unkind nature and wildlife, aided by go-to scientific experts, she raised questions seldom publicly examined.

When NSW decreed in August 2018 that to help drought-stricken farmers the killing of kangaroos and poisoning of dingos would ramp up, she told me: “The announcement to help farmers through drought by making it easier to kill kangaroos and to use their meat to poison dingoes is counterproductive, unethical, and has no basis in science.” She can speak from experience, including a two-year period when she and her partner managed a large cattle station in northern South Australia.

She knows first-hand the extreme stress of prolonged hot and dry conditions. It is an experience she won’t forget, and it informs her work as an ecologist, marrying the realities of farming in Australia with the desire to preserve the wildlife. In South Australia she also interacted with some neighbouring graziers who are forging their own way in wildlife-friendly farming. They have been running successful businesses, particularly organic cattle farming, while allowing wild animals such as kangaroos and dingoes to co-exist on their land.

She says that wildlife-friendly farming is a movement growing worldwide, with theoretical research supporting it. Ideals of compassion and respect for the individual are central tenets, getting away from treating animals just as management units.

Another theme is restoring a more natural balance in ecosystems by not targeting native predators like dingos for automatic destruction. This is not just a theoretical point. A new taxpayer-funded push of dingo destruction was launched while this book was being finalised, and as I learned of the mega 1080 drops in NSW national parks.

Wallach says research shows that dingo populations that are randomly killed actually increase in number, once the alpha dog is out of the picture. The same is true for kangaroo mobs where the top male is killed. These alpha males keep a sustainable order as they monopolise reproduction.

A similar story was told to me by Terri Irwin from Australia Zoo. From the experience on the family's conservation property in central Queensland, she has learned that dingos and kangaroos reach a stable population if unmolested. The dingos repay their ability to co-exist by keeping the foxes and cats down, she says. They appear to be preferred prey. Dingos there have never been known to pull down a calf on the property.

From Longreach, Queensland, cattle grazier Angus Emmott told *National Geographic* his experience. As he leaves the dingos alone, they form settled packs that permit only senior females to breed and they keep young dogs under control. On his property he too has observed that the dingos keep the kangaroo numbers down and take out feral cats and foxes and goats. He has no doubt the natural balance has great biodiversity benefits.¹⁹

Nevertheless, cultural and scientific groupthink, intolerance, and even paranoia have continued when faced with alternative points of view on wildlife's place in the environment. This was on full display with a bizarre witch-hunt in the nation's capital starting in 2009 that I reported on at the time and recount in the next chapter.

Back at the 2002 workshop, ecologist Harry Recher reminded everyone of the narrowness of conventional approaches to flora and fauna conservation:

“A real revolution in nature conservation requires a change in national priorities from ones of increasing economic growth, resource consumption and population growth to becoming an ecologically sustainable society.

“Landcare needs to return a minimum of 30 percent of existing cleared land to native vegetation with an additional 20 to 40 percent placed under deep-rooted perennials with a primary objective of providing other species with the resources they require to achieve their evolutionary potential.”²⁰