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In most instances relating to conservation, traditional, local and indigenous forms of knowledge and practice are ignored. In others, they play second fiddle to ‘scientific’ knowledge and practice, and are at best treated with romanticism or charitable condescension. In this issue of Current Conservation, we explore these themes further.

Our contributors offer a range of opinions and perspectives, some restrained, others not so. Charles Kay pulls no punches when he equates conservation with racism. In a thought-provoking article, he reminds us of the particularly effective record of colonial conservation when it comes to excluding and exterminating the native and in creating ‘wilderness’ untouched by man. Michael Adams discusses the significant potential for integrating different forms of knowledge into contemporary conservation strategies relating to climate change in Australia. Reviewing literature that compares traditional and scientific forms of knowledge, Meera Anna Oommen asks if dichotomising the two is justifiable? Christine Eriksen and Don Hankins explore the gendered dimensions of knowledge about fire in Native American and Aboriginal Australian communities and the possibilities of a dynamic transitioning into current day conservation planning. Elsa Reimerson traces the creation of the Laponia World Heritage Site in Scandinavia, one of the few in the world which offers the promise of indigenous management. We also carry a photo-essay by Manish Chandi and a review of M Kat Anderson’s ‘Tending the Wild’ by Caitlin Kight. Both address hotspots of traditional knowledge and management: the Nicobar Islands and California.

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Traditional knowledge—Nicobar

One of the most poignant moments I’ve experienced regarding perceptive reasoning in the Nicobar Islands was when I was asked to help prevent agricultural officers bring coconut seedlings onto Little Nicobar Island in an attempt to rejuvenate coconut plantations destroyed by the Asian tsunami of 2004. The rationale my friend, Mr Moses, gave me was that *Achatina fulica* (giant African snail) eggs could possibly arrive along with soil attached to saplings brought in from other islands, especially South Andaman island where Port Blair is located. *Achatina* is an invasive species here and has snailed its way through many a kitchen garden and other vegetation. This request was from a person who had not studied beyond primary school, who used perceptive reasoning along with acute observation to perceive a potential ecological invasion and threat to his native island and future kitchen gardens that were to be re-created after the devastating tsunami.

Traditional knowledge is, I believe, not static but organic. Knowledge passed down from generations past can evolve with our present to provide information useful not just about past practices, but help cope with future problems. In the few photographs that follow, I try to depict various livelihood situations and activities from across the Nicobar Islands that combine knowledge passed on from ancestors along with customary regulations that are still practiced, though some are on the threshold of change as well.



Fishing: Fishing for subsistence continues among the Nicobar islanders. Nearshore regions of many islands are marked out with both temporal and spatial bans of various kinds of fishing, either through gear restrictions or through seasonal regulations. Some festivities of the past ensured that fish and marine life were celebrated through pictographs as well as closures of certain seascapes for short periods for rejuvenation of fish populations. As a phenomenon, this is practiced less, with modernity and other concerns taking precedence over the former animistic way of life, while festivities and rituals that are associated with regulations on extraction are rarely practiced.





Ritual: A large 'Hantón' on Chowra Island. Before the advent of the South west monsoon, rafts such as these are constructed at five villages on the island to send away evil spirits beyond the island and out to sea, and to usher in prosperity for healthy crops. This is a time when the cycle of planting new crops also takes place after ensuring the growth of leaf litter within kitchen gardens to fertilise the soil. Renewing crops and plantations also often take into consideration synodic cycles, which as a technique, is increasingly being recognised for its value in many corners of the world.



Healing: Traditional healers or shamans are a nearly extinct ‘tribe’ among the Nicobar islanders. Till about a century ago, shamans more or less ruled the Nicobar Islands. They mediated between the supernatural and the villagers; they decided the fate of many activities and developments. Two types—good and bad shamans—are known. The good shamans bring about healing and facilitate an understanding of the unknown. Natural events, natural products of the forest and sea and the ancestral world are used and revered as a means to decipher enigmatic illnesses and events; their ability to communicate with the spirit world supports their powers of prophesy and also to decide the calendric nature of festivals, feasts and rituals for peace, prosperity, fury, disease and death. Knowledge of plants and the alchemy of their extracts was a key attribute of such healers. As few as three or four true shamans exist in the Central and Southern Nicobar islands today.



Hunting: While customary practices of the use of species on Tillanchong island, Central Nicobar is restricted to hunting wild pigs, sea turtles and fish, on other islands, a variety of species including crocodiles are hunted for the pot. On Tillanchong, only traditional gear (such as spears and harpoons) and techniques (ambush and pursuit with dogs) may be used. All protein is to be processed before leaving the island. Birds, monitor lizards and crocodiles are other sources of protein that are left alone as per customary law.



Fire: Grasslands are found largely in the Central Nicobars. At least 4 species of grasses provide thatch for the traditional beehive shaped huts of Chowra, Terassa and Car Nicobar. To ensure a fresh supply of good quality thatch, traditional burning is carried out every year in many locations. This is accompanied by hunting pigs and rats (on Chowra) and feasting among clans and friends. The burning season not only provides an opportunity to renew social bonds, it also serves as a harbinger of the south west monsoon, and remains one of a series of practices welcoming change in the yearly cycle of weather and renewal of livelihood resources. This is set to change with many villages being settled in the grasslands away from the coast after the tsunami.



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Aboriginal influences and the original state of nature: A new paradigm for conservation

National parks and wilderness areas originated in the United States and have since spread around the world. Given the history of the United States, it should then come as no surprise that national parks and wilderness are inherently racist. From the early 1600s, when Europeans first landed on the eastern shore of what was to become the United States, until the late 1880s, people of European descent waged constant war against the continent's aboriginal inhabitants. These were wars of annihilation and extermination. Indigenous peoples were portrayed as uncivilised savages and subhuman vermin marked by God for destruction by the superior White race. Indigenous women and children were routinely slaughtered. Even Native Americans who had converted to Christianity were butchered and their lands stolen.

George Washington, the first President of the United States, orchestrated a genocidal campaign against America’s original owners, as did virtually every president down to and including Abraham Lincoln, the man who freed the slaves.

Native people who survived were forced onto apartheid-like reservations, but even there the genocide continued. Corrupt Indian agents stole monies appropriated to feed their wards and thousands of Native Americans starved to death. Reservation peoples were prohibited from practicing ancestral religions and other aboriginal customs. Children were torn from their mothers’ arms and shipped to boarding schools where they were beaten if they dared speak their native language. Then there was Wounded Knee.

The US military had confined the Sioux to reservations in South Dakota. After years of suffering, a new native religion swept the West, including the Sioux reservations. Wovoka, a Paiute shaman, had a vision that there was to be a second coming of Christ, except this time Christ was going to be an Indian, who would rid the world of Whites. All native people had to do was dress and dance in certain, entirely peaceful ways. As might be expected, this set off a new wave of Indian-hating hysteria. The military was summoned and attempted to disarm a group of Sioux, who had gathered to practice this new religion. A shot was fired and the military opened up with everything they had including rapid-fire cannons. The soldiers fired so enthusiastically that over half the U.S. casualties were from friendly fire. That is, the soldiers shot each other in their eagerness to gun down fleeing savages. Two thirds of the Sioux dead were women and children, some killed as far as two miles from where the initial shot had been fired. Twenty members of the 7th cavalry were deemed “national heroes” and awarded the Medal of Honour, the US’s highest decoration, for their part in the “battle”. The Sioux call it murder. Such is the history of the United States. Even this, though, was not the worst of it.

What is now California was once populated by hundreds of thousands of indigenous peoples. Yet there are no large Indian reservations in California nor did the US ever mount large-scale military

campaigns in that state, unlike other areas of the American West. Why the difference?—because California passed a law which said that any White could kill any Indian at any time without cause. Local Whites formed sporting parties to hunt down savages. That law was eventually rescinded but a second law was passed, which made it illegal for Indians to testify against Whites in courts of law, so the killing continued until there were few aboriginal people left. There may have been closed seasons on deer (*Odocoileus* sp) or elk (*Cervus elaphus*), but there was no closed season on Native Americans.

Native people who survived were forced onto apartheid-like reservations, but even there the genocide continued. Corrupt Indian agents stole monies appropriated to feed their wards and thousands of Native Americans starved to death.

Today, Native Americans make up less than two percent of the US population and are the most disadvantaged segment of society with the highest unemployment and death rates. Except for a few large tribes like the Navajo, Native Americans are also in the process of being bred out of existence. On many reservations, as little as one-sixteenth aboriginal blood is needed to be counted as a tribal member.

Yellowstone was declared the world’s first National Park in 1872. That legislation stipulated that the park was not to receive any funding from the US government. Instead, park management was to be financed solely by entrance and concession

fees. In 1873, financial panic gripped the nation, what we today would call an economic recession or depression. Grant, the general who won the US Civil War, was president and he decided to start a new war to divert the country’s attention from his failed domestic policies and corrupt administration. He did this by sending General George Armstrong Custer and 1800 men into the Black Hills on the Sioux Reservation. This was in direct violation of existing treaties with the Sioux and was illegal. Nonetheless, as Grant had hoped, gold was discovered and Whites poured into the Black Hills, setting off war with the Sioux.

General Custer once boasted that given but a single troop of cavalry, he could ride through the entire Sioux nation. Well, in 1876, Custer put that hypothesis to the test on the Greasy Grass (aka Little Bighorn) and rode into history when his command was killed to the last man by the Sioux and their Cheyenne allies. A national hysteria ensued. In 1877, the US military was looking to kill Indians, any Indians. The Nez Perce were a peaceful people, who occupied a large, highly productive area where the states of Oregon, Washington, and Idaho meet today. After years of having their best lands stolen by Whites and their culture denigrated by missionaries, a handful of Nez Perce rebelled and killed a few Whites, intensifying national Indian-hating hysteria. The Nez Perce quickly realised that if they were cornered by the US military their people would be annihilated as payback for the Custer massacre, so the entire tribe decided to flee to Canada, a country with a more enlightened aboriginal policy.

The way directly north, however, was blocked by the US military, so the Nez Perce fled east, which eventually took them through the newly established Yellowstone National Park. While in the park, a small number of White tourists were killed or wounded by the Nez Perce, which only heightened national hysteria. The park’s indigenous Shoshone inhabitants avoided both the Whites and the Nez Perce and had absolutely nothing to do with this incident. Nevertheless, tourists fled the park and tourism declined to zero, as no sane White person wanted to visit a park filled with blood-thirsty savages. No tourists meant no entrance fees, no concession fees, and no national park.

To solve this problem, Norris, Yellowstone’s second superintendent, invented the myth that Native Americans never used the park because those simple-minded people feared Yellowstone’s geysers and thermal areas. Norris also had the park’s original Shoshone owners forcefully removed to distant reservations in Idaho and Wyoming. Thus, fortress conservation was born. That is, throw out the rightful, indigenous owners without compensation and then lie about it. It should also be remembered that the US Military ran Yellowstone National Park from 1886 to 1916 when the National Park Service was created. Moreover, as several authors have noted, the US Park Service’s treatment of indigenous peoples has been less than honourable. I would call it despicable.

Wilderness, though, is even worse because it absolves Whites of all their misdeeds. If everything was a wilderness untouched by the hand of man, then Whites could not have stolen indigenous lands nor committed genocide. If I could ban one word from the English language, it would be, “wilderness” as wilderness is a thousand times worse than slavery. Slaves, after all, were bred and kept alive. No such kindness was shown to Native Americans. In addition, freed slaves became citizens of the United States 70 years before the federal government “granted” US citizenship to indigenous people. Moreover, freed slaves joined the Union Army to hunt down and kill aboriginal peoples.

Some contend that indigenous peoples were conservationists. While calling aboriginal people conservationists may appear to be the only kind things Whites have ever said about Native Americans, in reality it is an act of “immense condescension” because it implies that native people lacked agency—defined as the ability to manage their affairs or to purposefully modify their environments. If indigenous people lacked agency then they were no more than animals. Instead, as I and others have documented, by keeping ungulate numbers low through hunting and by purposefully modifying plant communities with fire, aboriginal people created ecosystems across the globe. What Europeans saw when they first stepped off the boat had not been created by God or Nature, but by indigenous peoples.

For nearly 100 years, large numbers of food-limited elk have severely overgrazed Yellowstone Park's northern range destroying aspen (*Populus tremuloides*) and willow (*Salix* sp) communities—vegetation types that normally have exceedingly high biodiversity. Wolves (*Canis lupus*) were introduced in 1995 and since that time the elk count on the northern range has fallen from 19,000 to just under 4,000. This has spawned a plethora of publications, both popular and academic, on the importance of keystone carnivore predation and trophic cascades. Although purported to be science, this outpouring is simply more White racist theology.

First, as Stiner and I have documented, even early hominids, let alone indigenous peoples were more efficient predators than carnivores. Second, while wolves have lowered elk numbers, wolf predation has not reduced Yellowstone's bison (*Bison bison*) population, which is still overgrazing the park. Third, what wolves? Between 1835 and 1876, 20 different expeditions spent 765 days on foot or horseback in the Yellowstone Ecosystem, yet no one reported seeing or killing a single wolf. Fourth, wolves are not known to carry drip torches or to start fires. According to fire-scar data reported by the Park Service, Yellowstone's northern range historically had a fire frequency of once every 25 years. This means that an area equal in size to the northern range historically burned once every 25 years—not by one large fire, but by many small fires.

Well, Yellowstone has had a let-burn policy now for nearly 50 years, yet none of the northern range has been burned. The Park Service has said this is because “lightning has chosen not to strike”, but the government's own data shows that lightning strikes the northern range an average of four times per square kilometre per year. Those lightning strikes, however, occur during June, July, and August when the park's grasslands are too green to burn. Thus, the only plausible explanation for the documented burn interval that historically occurred on the park's northern range is that all those fires were purposefully set by indigenous people to manage their environment. Elsewhere, I have compared known lightning-ignition rates in the United States with potential aboriginal-

ignition rates and found that aboriginal-set fires were 270 to 35,000 times more frequent than fires started by lightning. It must also be remembered that hunting by native peoples has been a natural process in the Americas for at least the last 12,000 years and longer on other continents.

If, as I and others have documented, namely that indigenous peoples the world over acted as both keystone predators and keystone fire-starters, why then does the scientific community continue to ignore those data? Anthropologist Omer Stewart addressed this very issue 50 years ago.

Views of peasants and country folk belonging to the same race and culture as the investigators are placed below consideration, but ancient practices and explanations of red Indians and black Negroes warrant no serious thought, even if known. Usually the White scientists refuse to learn the ways of the coloured aborigines, whether New World or Old World because it is assumed such children of nature could contribute nothing to modern scientific inquiry.

(Stewart OC. 1956. Fire as the first great force employed by man. Pages 115-133. In: *Man's role in changing the face of the earth* (Ed WL Thomas) University of Chicago Press, Chicago, USA)

Unfortunately what passes for scientific discourse today is the same racism that Stewart described.

Recently, Dr Bruce Smith, who spent his career as a wildlife biologist employed by the US Fish and Wildlife Service, published a book on elk management in Jackson Hole, which includes southern Yellowstone National Park, Grand Teton National Park, the National Elk Refuge and several federal wilderness areas. The valley's over-abundant elk problem has a long and storied history that need not be repeated here except to note that biologists, environmentalists and sport hunters all assume that 15,000 to 20,000 elk have always occupied Jackson Hole. Dr Smith's book has been favourably reviewed in academic journals by prominent wildlife ecologists and the environmental community has given Dr Smith an award for his work in Jackson Hole. In short, wildlifers and environmentalists all praise the book. In reality, though, the book is simply another discourse in White

racist theology. Not only are Native Americans not even mentioned, but Dr Smith also ignored all the existing archaeological data.

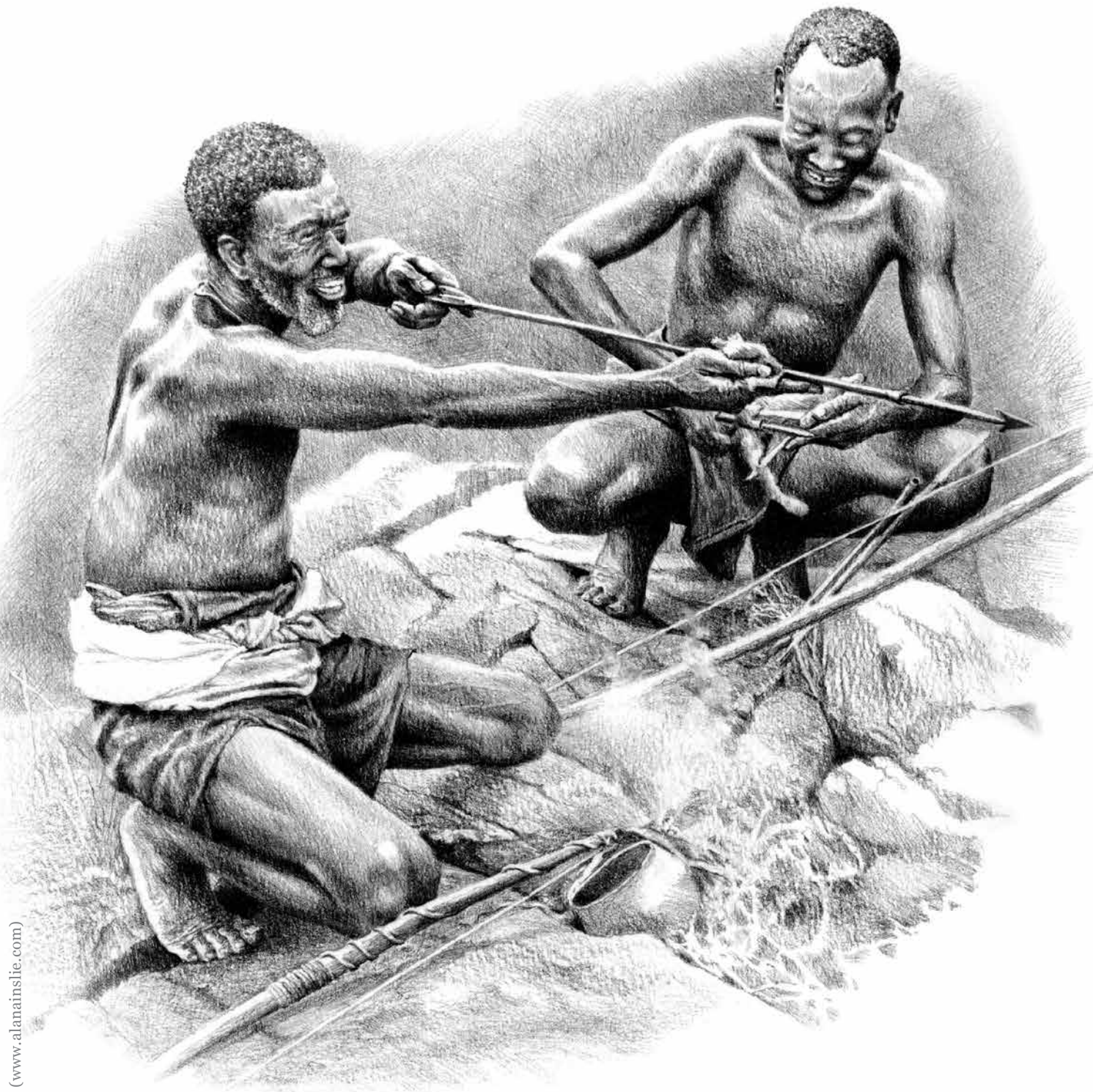
Dr Gary Wright spent years excavating archaeological sites in Jackson Hole and published a 1984 book on his findings. Now if thousands of elk have always inhabited Jackson Hole, as assumed by Dr Smith and others, then elk bones should be common in the valley's many archaeological sites. Instead, elk bones are rare to non-existent in archaeological sites and according to the evidence unearthed by Wright, aboriginal people, who inhabited Jackson Hole for at least the last 10,000 years, subsisted primarily on plant resources.

Moreover, as archaeologist Wright noted, *Keep in mind that I have [been] battling wildlife biologists from Grand Teton and Yellowstone Parks for some years. One told me, after a seminar I gave at the Jackson Hole Biological Research Station on the faunal resources of the regions.*

“Even if you demonstrate that no elk were here, we would still continue to argue for them because our management policies require a herd of at least 10,000 elk by the end of the last ... deglaciation.”
(Wright GA. 1984. *People of the high country: Jackson Hole before the settlers*. Peter Lang, New York, USA)



Pencil Sauce



Alan Ainslie (www.alanainslie.com)

Using poison derived from specific shrubs and trees for their arrowtips, Wata bowmen were among the most skilled elephant hunters in Africa.

Similarly, I was once told by a Wyoming Game and Fish Department biologist,

“We are not going to consider your data because if you are even close to being correct, then everything we are doing is wrong, and we are not ever going to consider that possibility.”

Is this science? Or is it theology? After the results of Dr Wright’s research became known, federal and state agencies terminated Dr Wright’s funding. Scientific fraud, after all, begins with who gets funded, or hired, and who does not.

It really should come as no surprise that the wildlife profession is fundamentally racist once you understand how that discipline developed. Aldo Leopold was the father of wildlife management in the United States. He held the first university position in the field and wrote the first wildlife management text. He also was a founding member of the Wilderness Society, as well as a prominent member of the Ecological Society of America and the Wildlife Society. As a Forest Supervisor, Leopold established the first wilderness area in the US. Aldo Leopold was an extremely prolific writer and he has been lionised by the environmental movement.

Unfortunately, Aldo Leopold was also a racist of the worst kind for he totally ignored Native Americans. Dr Leopold began his career as a Forest Ranger in New Mexico. New Mexico is a very dry state and indigenous peoples built with stone. There are thousands upon thousands of highly visible archaeological sites in New Mexico including Chaco Canyon, which is now a World Heritage Site. In addition, there are Pueblo, Zuni, Navajo, Ute, and Apache reservations in the state. Furthermore, there is a written historical record dating to the mid 1500s when the Spanish first explored and then occupied the area. How anyone could work in New Mexico as Aldo Leopold did and not even mention native people speaks volumes of how deeply Indian-hating and racism is buried in American culture and the scientific community. Similar situations exist in African national parks and other protected areas throughout the world.

For instance, uncontrolled elephant (*Loxodonta*

africana) populations are having serious negative impacts in many southern African national parks. Most biologists claim this destruction is “natural” and deny that aboriginal hunters had any significant effect on elephant numbers. They conveniently overlook the fact that indigenous peoples, such as the Wata, were skilled elephant hunters. The most proficient Wata hunters killed 50, or more, elephants per year using “primitive technology.” One arrow-one dead elephant, in minutes.

To stop the growth of an elephant population only slightly more than three percent of the animals need to be killed per year, while a four percent off-take rate will drive elephant numbers to extinction. Thus, a handful of indigenous hunters could easily have controlled elephant numbers. One Wata hunter alone could have controlled a population of 1000 elephants by killing no more than 35 animals per year. Without indigenous elephant population control, large numbers of very old baobab (*Adansonia digitata*) trees would not exist on the African landscape, because baobabs are one of the first species elephants eliminate. Nothing is more unnatural than an African ecosystem without hominid hunters and firestarters, unless, of course, one does not believe in evolution.

Nothing is more unnatural than an African ecosystem without hominid hunters and firestarters, unless, of course, one does not believe in evolution.

Unfortunately, the vast majority of biologists and ecologists have no interest in human evolution. Anyone who thinks that huge quantities of animal biomass can be tied up in elephants and other mega-herbivores and not be subjected to intense human hunting, knows absolutely nothing about human evolutionary ecology or why men hunt.

Instead evolutionary considerations are ignored because they do not support romantic, religious, and racist views of nature.

Contrary to what one might think, conservation and sustainability are not the end products of evolution. Instead, conservation will develop only when a resource is economical to defend. Think of economics as calories. If it takes 1,000 calories to defend a resource but less than 1,000 calories are obtained when that resource is consumed, evolution by natural selection will quickly eliminate the inefficient, be they humans or animals. Regarding types of land ownership with open-access on one end of the spectrum and private property on the other, private property is the most conducive to conservation. Furthermore, within any one society, conservation benefits elites more than it does the common man or woman. In short, conservation favours the rich and well fed, while preservation favours the super-rich and the super well fed. National parks and wilderness areas are preservation, not conservation. Opinion polls in the US show that the public supports conservation, but not preservation, which is why the term conservation is now applied to most everything, while preservation is seldom mentioned.

As study after study has shown, and as predicted by human evolutionary ecology, indigenous peoples whose lands and resources have been usurped to create protected areas become, “the enemies of conservation,” something education alone will never change. If local people are to support conservation or preservation, then their lands must be returned along with ownership of wildlife and all other resources, plus they need to be paid. Why is the world filled with cattle, goats, sheep, chickens, and the like? Simple, they are private property and anyone, who wants to use or consume those resources, must financially compensate their owners. Similarly, why are there national ballets, symphony orchestras, sport teams, and other high-priced, ticket items favoured by elites?—because the performers are paid. How long do you think a symphony orchestra would last if its members were not paid for their services? Right, so why then should poor, indigenous people provide free conservation services for Whites and

other elites? How long do you think movies would be made if everyone could view them for free?

In general, community-based conservation programs have had a poor track record because conservation-generated income has habitually been siphoned off by various levels of government or through elite capture, including graft and corruption. To be successful all the money from community-based conservation programs must reach the individual people, who actually bear the associated costs. It is really quite simple—pay local people to provide conservation services or repeal the laws of evolution. The United States and other developed countries can afford to practice preservation because they are rich and their people are very well fed. In addition, they are expertly managed police states. You do not think the US is a police state? Then obviously you are not a Sioux, or Nez Perce, or Blackfoot, or... [a long, nearly endless list].

Suggested reading

Anderson MK. 2005. *Tending the wild: Native American knowledge and the management of California’s natural resources*. University of California Press, Berkeley, USA.

Brown D. 1970. *Bury my heart at Wounded Knee*. Holt, Rinehart and Winston, New York, USA.

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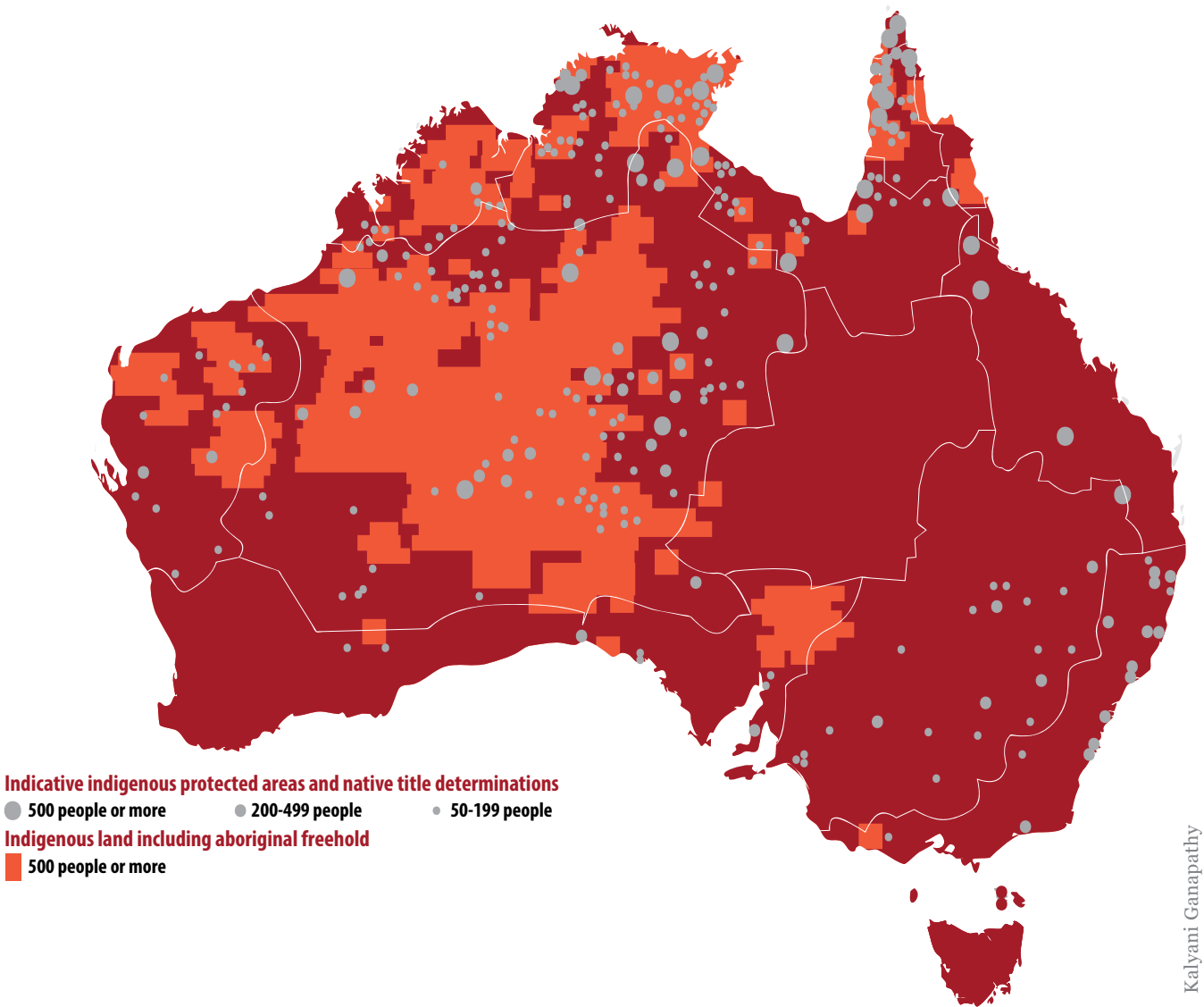
Nabokov P & L Loendorf. 2004. *Restoring a presence: American Indians and Yellowstone National Park*. University of Oklahoma Press, Norman, USA.

For the full, referenced version of Prof Kay’s article, readers are encouraged to visit <http://www.liberty-source.org/wp-content/uploads/ipePublications/Aboriginal-Influences-and-the-Original-State-of-Nature.pdf>

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Indigenous knowledge and climate change in Australia

Can the traditional knowledge of Australia’s indigenous communities keep pace with climate change?

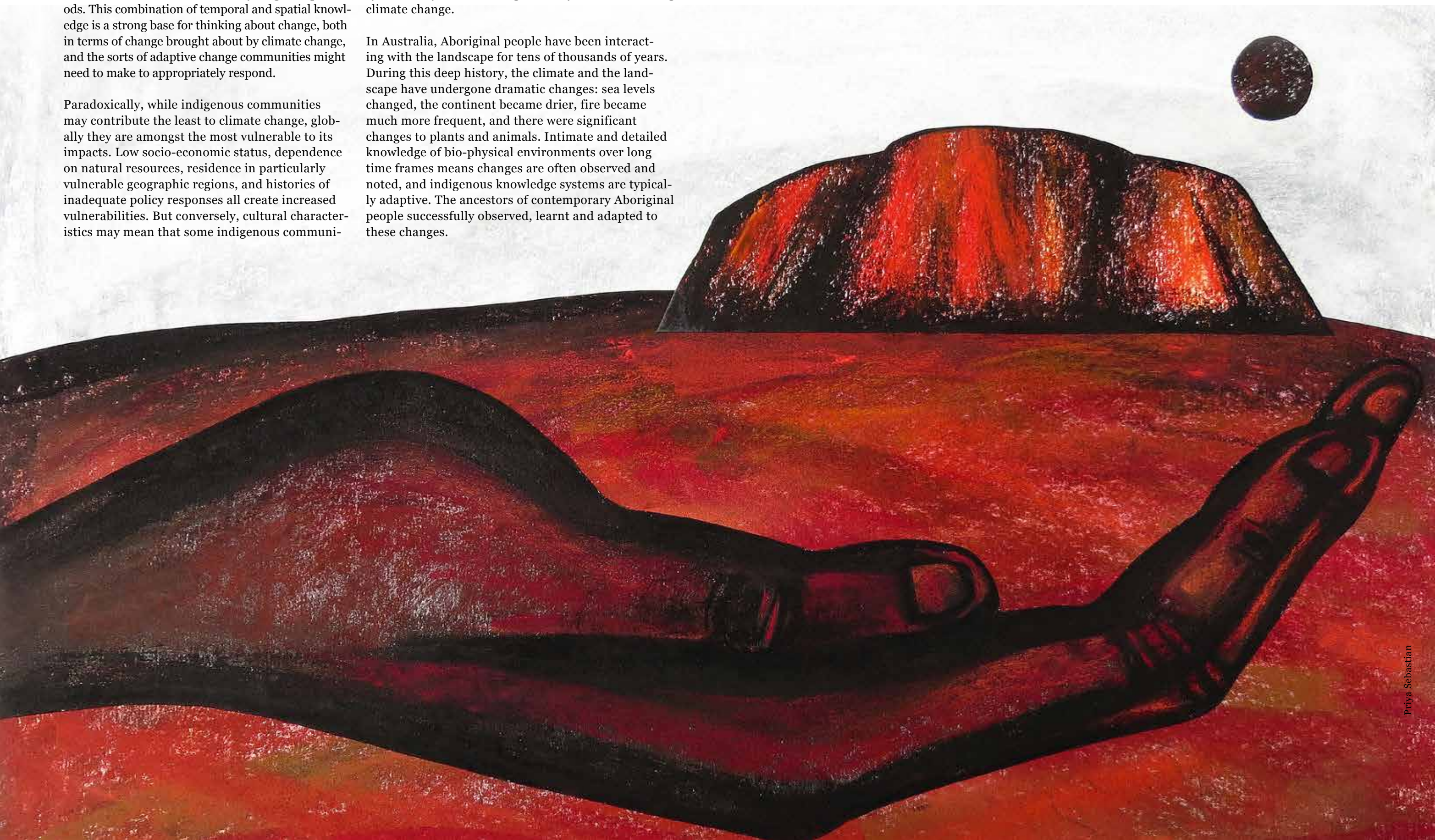


Indigenous knowledge systems are often characterised as including very detailed understandings of local environments, often over very long time periods. This combination of temporal and spatial knowledge is a strong base for thinking about change, both in terms of change brought about by climate change, and the sorts of adaptive change communities might need to make to appropriately respond.

Paradoxically, while indigenous communities may contribute the least to climate change, globally they are amongst the most vulnerable to its impacts. Low socio-economic status, dependence on natural resources, residence in particularly vulnerable geographic regions, and histories of inadequate policy responses all create increased vulnerabilities. But conversely, cultural characteristics may mean that some indigenous communi-

ties are well-placed to develop effective adaptive responses to climate threats, and indigenous knowledge systems may contribute significantly to understanding climate change.

In Australia, Aboriginal people have been interacting with the landscape for tens of thousands of years. During this deep history, the climate and the landscape have undergone dramatic changes: sea levels changed, the continent became drier, fire became much more frequent, and there were significant changes to plants and animals. Intimate and detailed knowledge of bio-physical environments over long time frames means changes are often observed and noted, and indigenous knowledge systems are typically adaptive. The ancestors of contemporary Aboriginal people successfully observed, learnt and adapted to these changes.



The Australian indigenous population is around 575,000 or 2.5% of the Australian population. Indigenous people from mainland Australia are usually termed Aboriginal, with Torres Strait Islanders forming a culturally distinct indigenous group from the islands between Australia and Papua New Guinea, and within both these broad groupings there is significant diversity. While there is an increasing population concentration in urban areas, one quarter of indigenous people live in remote or very remote areas. Some of this relatively small population owns and manages around 20% of the continent, albeit very unevenly distributed geographically and demographically, and much of it in arid, semi-arid and tropical zones, including significant areas of coastline.

The large extent of this indigenous land makes it significant not only for indigenous people but the broader Australian community as well. Residence in and connection to indigenous territories in particular geographic areas will interact with climate change impacts. Exposure to extreme weather events is already occurring and likely to increase in arid and semi-arid, coastal and island, and riverine regions. Biophysical changes such as increases in introduced species, changed water regimes and altered fire regimes will have cultural, economic and health outcomes.

However, the nature of indigenous land holdings also offers some unique opportunities for creative responses to climate change issues. The West Arnhem Land Fire Abatement program (WALFA) is an example of successful collaboration in offsetting carbon emissions from a gas producer while simultaneously supporting cultural and biophysical outcomes. WALFA uses offset payments to support a specific cultural savanna burning strategy that contributes to continuities of knowledge and culture while simultaneously maintaining high biodiversity and reducing carbon production from wildfire. In 2000, savanna wildfires caused 40% of official greenhouse gas emissions in the Northern Territory and accounted for 2–4% of Australia’s total greenhouse gas emissions. Traditional custodians of the region use a fire strategy which creates significantly less CO₂ emissions than that generated in wildfires. In three years of operation, the WALFA scheme reduced emissions

by the equivalent of 450,000 tonnes of CO₂ which was 50% above target. The success of WALFA is dependent on the rich customary fire knowledge of local Aboriginal people, working collaboratively with scientists.

New national policy initiatives such as the Carbon Farming programme are attempting to engage further with Indigenous landholders to develop combined cultural, environmental and economic outcomes, including a targeted Indigenous Carbon Farming Fund.

The large extent of this indigenous land makes it significant not only for indigenous people but the broader Australian community as well. Residence in and connection to indigenous territories in particular geographic areas will interact with climate change impacts.

The very large areas of aboriginal land in central Australia are often in arid and semi-arid regions. These landscapes, and their indigenous communities, have co-evolved in conditions of environmental uncertainty, with long periods of low rainfall interspersed with intense rainfall events. This means there is already significant resilience built in to these social-natural systems and some of the species which inhabit them.

In these and other landscapes, seasonal observations of ecosystem patterns and conditions are used to determine appropriate hunting strate-

gies. If some species are declining due to changes, hunters will switch to more abundant species. Aboriginal people hunt native red kangaroos, as well as introduced species such as rabbits, camels and cats, all of which are widespread and adaptable. They are also actively involved in programmes to reintroduce locally extinct species, using their deep knowledge of animal ecologies to assist such programmes. In arid regions, scattered rockholes which retain water during dry periods are critically important for many species (and people). There is a long cultural tradition of looking after these rockholes, keeping them clean and accessible. Climate change impacts which include longer dry periods will mean such practices are very significant and in some communities Aboriginal people are also creating additional rainwater catchment systems specifically for wildlife, using modern technologies to offset the decline in water from rockholes.

Analysis of the relationships between indigenous cultural characteristics and climate change impacts suggests both strengths and weaknesses. The maintenance of extended kinship networks can exacerbate residential overcrowding in situations of inadequate housing, widespread in urban, rural and remote locations. Overcrowding can then lead to increased health vulnerabilities. Conversely, the same extended kinship networks may generate significant social capital and broader exchange networks that may offset decreased access to appropriate food and other resources. The highly mobile nature of many indigenous families can increase possibilities for relocation due to, for example, extreme coastal weather events. However, this could also lead to localised overcrowding and increase vulnerability due to inadequate infrastructure including road access, housing and health services. Many indigenous communities exist at the peripheries of government and civil

support, both geographically and in policy terms. While this obviously increases vulnerabilities, it also means that communities are often used to being self-sufficient and may respond more effectively to breakdowns in civil services.

Prominent researcher Fikret Berkes makes a distinction between ‘cognitive knowledge’ in the sense of a body of facts and understandings that can be passed on between generations, and knowledge as process, undergoing continual change and development as people interact with changing environments over time. Both of these forms of knowledge are used by indigenous peoples in responding to climate change. Because indigenous homelands are often located in what are characterised as extreme environments (arctic, arid, tropical), they are often the first to observe changes, which occur much faster at these locations. Their experience with these complex and challenging environments thus enables them to develop adaptive strategies, using millennia of knowledge and skill. Some of these adaptations are in conjunction with scientific approaches, and some are developed entirely independently.

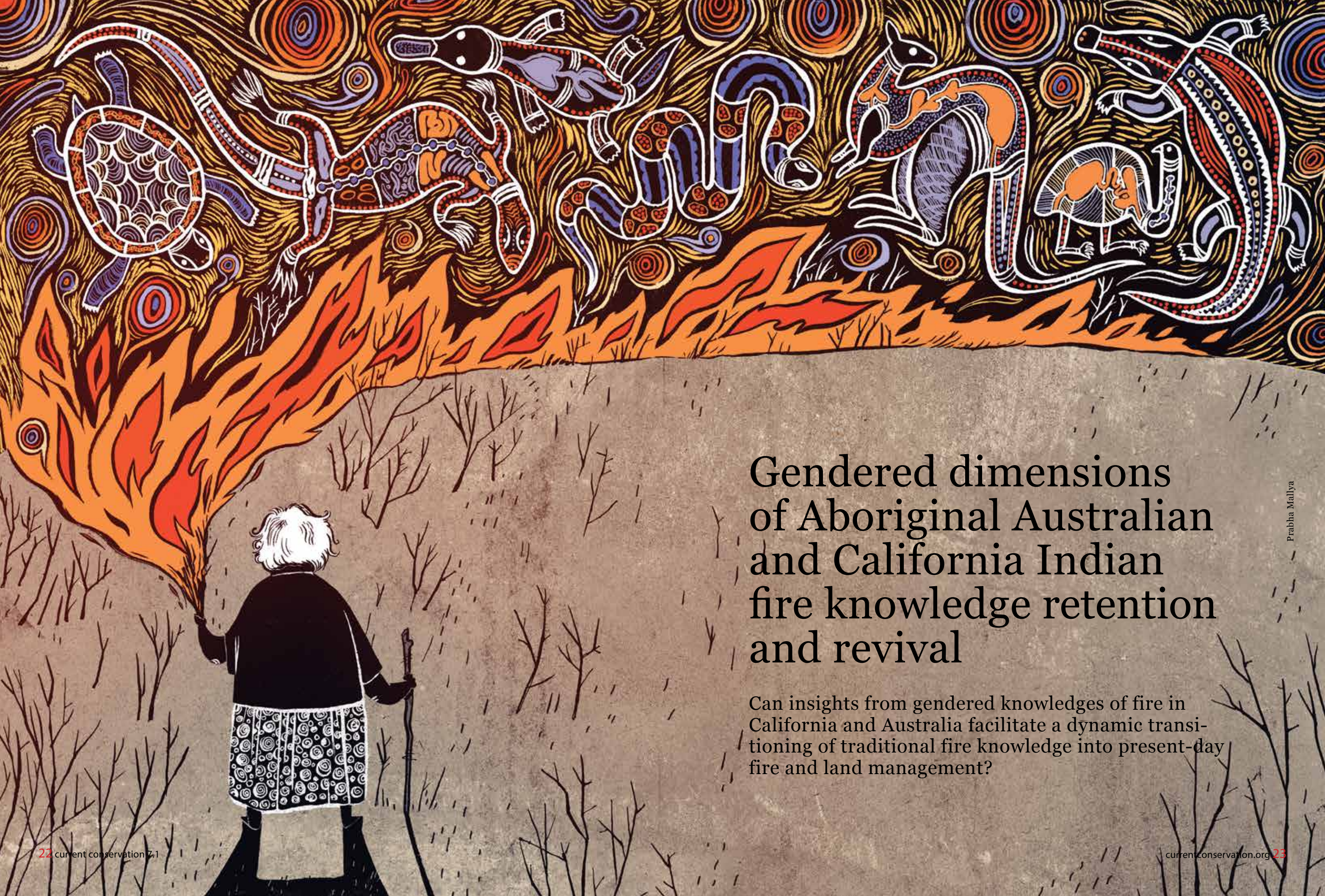
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Gendered dimensions of Aboriginal Australian and California Indian fire knowledge retention and revival

Can insights from gendered knowledges of fire in California and Australia facilitate a dynamic transitioning of traditional fire knowledge into present-day fire and land management?

Fire has played a key role in the land management practices of Aboriginal Australians and Native Americans for millennia. However, colonial interests have disrupted indigenous use of fire in multiple ways. This article summarises how gender is entwined—spatially and temporally—in the adaptive knowledge trajectories through which some Aboriginal Australian and California Indian fire knowledge is retained and revived. The article draws on oral narratives shared by indigenous elders, cultural practitioners, and land stewards during prescribed burns, fire knowledge workshops, field trips with students, informal conversations and audio-recorded interviews.

A FIERY CONTEXT

A ‘disconnect’ between the past, present and future of both ecological and cultural aspects of fire underpins a tendency amongst many researchers, policy makers, and practitioners to dismiss or ignore fire knowledge that is alive today amongst indigenous elders and cultural land stewards in Australia and the United States of America (USA). Instead, guidance is sought from archaeological and anthropological records or from scientific models that project the future. This tendency persists despite the tangible results of adaptive management frameworks that have empowered indigenous knowledge keepers to practice fire.

The many similarities between New South Wales, Queensland and California—ecological, colonial, pyro-geographical and between indigenous environmental knowledge and burning practices – invite comparison with one another. Our findings further support this comparative approach despite running the gauntlet of scholarly criticism regarding the portrayal of all indigenous knowledge as being similar.

Indigenous eco-cultural burning is distinguished from agency fire management in the context of traditional law, objectives and the right to burn. By ‘traditional’, we refer to the time-tested knowledge and customary practice, which still guide many indigenous societies. Traditional law and lore are rooted in the landscape and stories that define a given culture. By ‘lore’ we refer to story, where indigenous law is coded in the lore. Many

examples of fire in the stories of indigenous people explain various aspects of fire knowledge from inter-specific relationships to devastating fire. This knowledge informs how a culture interacts with fire spatially and temporally.

It is important to recognise that culture and knowledge are as dynamic as the environment. From an applied standpoint indigenous fire knowledge is fluid (for example, changing with past climatic events), and the ability to read the landscape to know how, when, why and what to burn comes with proper training. The concept of ‘proper training’, however, arguably plays out differently today due to the impacts of history and politics.

Although uneven in time and space, colonial processes introduced a new paradigm of law into indigenous cultures. Colonial interests in both Australia and the USA disrupted indigenous use of fire through the removal of indigenous people from their lands, policy prohibition, and other pathways. This arguably resulted in both a forced loss of memory of land and the displacement of knowledge on fire management. Access to land is important to indigenous peoples’ memory of land, self-identify, and for their sense of belonging. The land is not only the source of traditional law and lore, it is what defines many indigenous cultures; when the ties to the landscape are compromised, so too is their culture. With colonisation, the indigenous obligations to burn as responsible environmental stewards were in many cases restricted from application at a landscape scale to memories and cultural stories. The struggle to recognise indigenous fire as a keystone process has consequently encountered many challenges and the place of indigenous burning practices in present-day landscapes continues to be a source of much contention.

A TRAJECTORY OF INDIGENOUS FIRE KNOWLEDGE HOLDERS

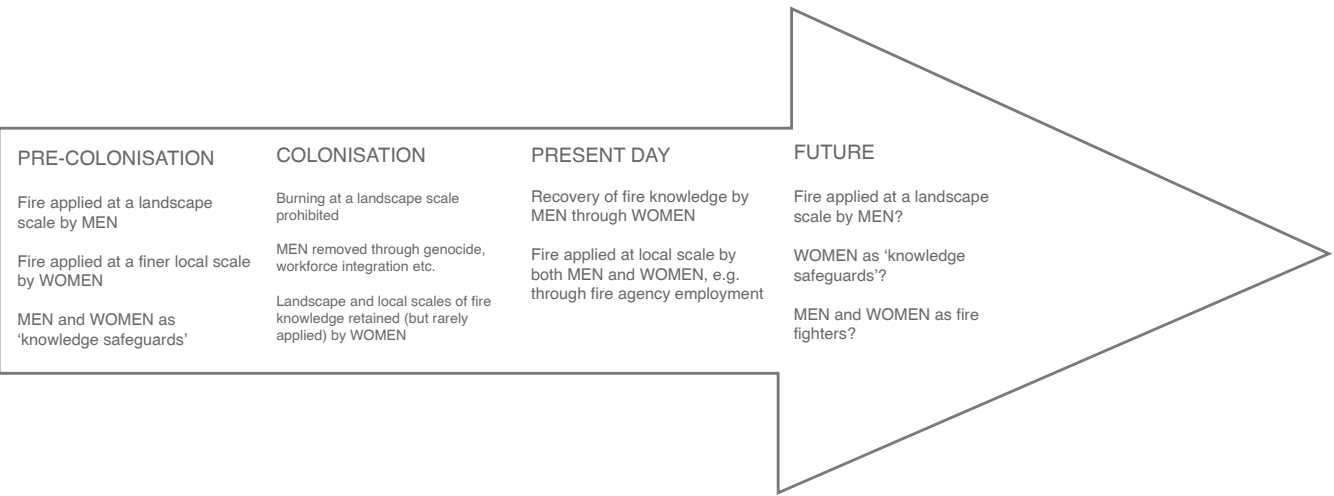
Despite the impacts of colonisation, indigenous laws have remained at the root of many Aboriginal Australian and California Indian communities through their continuing operation outside present-day colonial laws. In some regions of

northern and central Australia, indigenous law and practice are still applied through fires ranging in scale. For example, individual plants are targeted for food and basketry resources whereas fire is utilised at the landscape scale for hunting and environmental management purposes. In California, this happens at a fine localised scale at present although it was comparable in scale to the Aboriginal fires of Australia historically. These examples demonstrate a chain of knowledge from which to contrast indigenous and non-indigenous fire use and management practices. However, many indigenous people working with fire today are trained within the Eurocentric and patriarchal notion of fire fighting. Fire among indigenous cultures is therefore a complex affair, which has been muddled by colonial laws, policies and practices.

From our experience, the knowledge of indigenous fire practices persists in varying formats among many indigenous women and men who are either cultural practitioners or land stewards within land

ship knowledge. The diagram illustrates a generalised view of this spatial, temporal and gendered trajectory of Aboriginal Australian and California Indian fire knowledge holders in New South Wales, Queensland and California.

According to our research, the layering of fire knowledge and rituals has traditionally been the purview of the ‘burn boss’—a role that seems to have fallen mainly (but not exclusively) to men. It seems that prior to colonisation, men were the holders of the fire knowledge that was applied at a landscape scale, while women held fire knowledge in the context of finer scale burning for specific purposes, such as plant foods or basketry. Even though such gendered norms and gender roles were interwoven into indigenous everyday practices, this did not seem to preclude an understanding of the underlying knowledge by the other sex. That women in many places became the main carriers of fire knowledge is directly linked to the impact of external social factors, such as male genocide.



and fire management agencies. Their employment or engagement with such agencies reflects a need for fluidity within a culture over time for its well-being and ultimate survival. Although gender norms are interwoven into indigenous law, the stories shared with us strongly indicate that the gender of specific indigenous knowledge keepers is generation-dependent due to the impact of external social factors past and present. A temporary generational crossover of gender roles and gendered knowledge has been forged to ensure the retention of indigenous fire and land steward-

However, recognition of whom—women or men—the knowledge and customs belong to traditionally remains with the intent of returning the knowledge to its rightful gender when time and space allow.

An example of such dynamic transitioning of indigenous fire knowledge is the ways in which Aboriginal Australians and California Indians have been able to reconnect with land they are otherwise denied access to through employment with wildfire management agencies. While agency fire

management may differ from traditional burning practices and outcomes, employment inadvertently opens up an avenue for the retention and fortification of elements of indigenous fire knowledge through interaction with land. Such employment has tangible positive outcomes, such as the recorded increase in physical, mental and social health among indigenous employees and their communities. However, these outcomes can also obscure the power struggles, contrasting cultural norms, rules, and generational gendered fluidity that underpin the interaction between indigenous and agency fire knowledge.

Agency approaches to fire fighting contribute to the breaking of traditional rules surrounding what knowledge is shared with whom in the context of indigenous eco-cultural burning. Equal opportunity policies within federal and state agencies, for example, result in fire knowledge and training opportunities in theory being shared equally with men and women of indigenous and non-indigenous heritage. Another example of cultural sensitivity (or lack thereof) is the impact of wildfire fighting on indigenous sacred sites, women's and men's ceremonial sites, and other areas of significance. When a helicopter used an Aboriginal rock art site as a landing pad, one Aboriginal fire fighter felt the site was being "desecrated". The traditional laws governing knowledge of and access to such sites are often related to an individual's own role within the society and may be linked entirely to gender or restricted to initiation into a given group. In this sense, employment with wildfire management agencies is simultaneously an important element in the retention of indigenous fire knowledge through access to and caring for tribal land, and defies cultural laws and practice, which could subvert the revival of traditional indigenous burning practices. The long-term effect of agency employment on the retention and revival of indigenous fire knowledge is therefore a critical unknown.

CONCLUSION

By illustrating gendered dimensions of the temporal and spatial trajectories of Aboriginal Aus-

tralian and California Indian fire knowledge holders, this article reveals how gender is at the crux of the story of how fire knowledge has been able to persist over time. Even when the practical connection to land has been hindered in the past and present, the cultural connection of indigenous laws to their source—the land—enables knowledge transfer across gender rather than knowledge prohibition caused by static gendered norms. By forging temporary generational crossovers of gender roles and gendered knowledge, the retention of indigenous fire knowledge and environmental stewardship has been ensured despite generations of externally imposed cultural hardship. These adaptive knowledge trajectories hold many lessons, which can aid ongoing discussions about how to coexist with fire in the 21st Century. In working together with indigenous communities, wildfire management agencies stand to gain through the protection of a real asset at risk, namely the cultures that have shaped our landscapes since time immemorial.

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Some perspectives on knowledge—going beyond dichotomies

‘Scientific’ knowledge often occupies a privileged spot while traditional knowledge is considered inferior and poorly constructed. Are the two really different?

Once viewed as an inferior form of knowledge, with little potential to contribute to development, traditional and indigenous forms of knowledge are finding increasing mention in the development discourse. This turnaround has been partly due to the failure of large-scale, state-sponsored development agendas, and the search for solutions that are more grounded in place, time and context. In this respect, the knowledge and practices of indigenous communities, minority groups and marginalised peoples are being promoted as solutions that are practical, sustainable and alternative to what have been commonly considered as scientific solutions and technological fixes derived from Western science. Local practices, lifestyles and governance systems of communities who use the commons and common property resources are often labeled as falling in the traditional realm of knowledge. Pastoral governance systems that regulate stocking and migration, local agricultural practices, communal water management, and the rituals and seasonal taboos of communities that practice hunting are examples.

While the resurgence and renewed acceptance of traditional systems is long overdue and a welcome move, in order to be effective in any fashion, it is important to understand the challenges associated with dichotomising knowledge as traditional vs. ‘scientific’. To many, the contrasts between traditional knowledge and scientific knowledge seem obvious. Wikipedia's descriptions of science and traditional knowledge are good examples of such widespread thinking which considers science as a separate entity from traditional knowledge:

Science (from [Latin](#) scientia, meaning “knowledge”) is [defined as as] a systematic enterprise that builds and organizes [knowledge](#) in the form of testable [explanations](#) and [predictions](#) about the [universe](#)^[1]. An older and closely related meaning still in use today is that found for example in [Aristotle](#), whereby “science” refers to the body of reliable knowledge itself, of the type that can be logically and [rationally](#) explained (see [“History and philosophy” section](#) below).¹

whereas

Traditional knowledge (TK), **indigenous knowledge** (IK), [traditional environmental knowledge](#) (TEK) and **local knowledge** generally refer to the long-standing [traditions](#) and practices of certain [regional](#), [indigenous](#), or local [communities](#). Traditional knowledge also encompasses the [wisdom](#), knowledge, and teachings of these communities. In many cases, traditional knowledge has been [orally passed](#) for generations from person to person. Some forms of traditional knowledge are expressed through [stories](#), [legends](#), [folklore](#), [rituals](#), [songs](#), and even [laws](#). Other forms of traditional knowledge are expressed through different means.²

The above two descriptions are very different with emphasis on dissimilar keywords. Words and phrases such as testable explanations, prediction, reliability, logic and rationality, which characterise the description of science are absent from traditional knowledge which includes tradition, wisdom, stories, legends, folklore, etc. The divide between science and traditional knowledge is not the only dichotomy in popular perception. Many

¹ <http://en.wikipedia.org/wiki/Science>, Accessed on 6th January 2012

² http://en.wikipedia.org/wiki/Traditional_knowledge, Accessed on 6th January 2012



others can be listed. For example, Western science vs that of Oriental civilisations, modern vs traditional, primitive vs civilised, and numerous others. In the current scheme of things, all or most of our views and assumptions also tend to place modern science as a largely Western contribution.

In popular perceptions and scholarly discourses on the differences between indigenous/ traditional and Western/ scientific knowledge, the attempt has been made to understand if there are at all clear cut differences. For example, in *'The Savage Mind'*, Claude Levi-Strauss attempted a comparison of two modes of thought towards gaining knowledge. Using the comparison of the bricoleur and the engineer, he outlined two stages of development of thought. The first—mythical thought—alludes to activities carried out by a handy-man who works with his hands, carries out a variety of odd-jobs, improvises to make do with what is available without recourse to concepts. The engineer on the other hand is presented as a person dealing with concepts and structure. Though these metaphors are used to characterise 'primitive' and 'modern' societies, Levi-Strauss did not intend one to be superior to the other, and the notion is a good one to explain the dichotomy between a 'savage mind' and a 'scientific mind'. More recently, looking at traditional ecological knowledge (TEK), Fikret Berkes lists some substantial ways in which TEK differs from scientific

ecological knowledge. According to him, TEK is mainly qualitative (as opposed to quantitative), has an intuitive component (as opposed to being purely rational), holistic (as opposed to reductionist), mind and matter are considered together (as opposed to a separation of mind and matter), moral (as opposed to supposedly value-free), spiritual (as opposed to mechanistic), based on empirical observations and accumulation of facts by trial-and-error (as opposed to experimentation and systematic, deliberate accumulation of fact), based on data generated by resource users themselves (as opposed to that by a specialised cadre of researchers), based on diachronic data, i.e., long time-series on information on one locality (as opposed to synchronic data, i.e., short time-series over a large area).

However, despite extensive attempts, these differences (and similarities) remain difficult to pinpoint along multiple dimensions or along a finite set of measurements. Berkes himself cautions the reader to be aware of the exceptions to the generalisations. These and other investigations that have been carried out try to characterise the dichotomy based on three broad categories: substantive, methodological, and contextual. Substantive differences allude to differences in the subject matter that is dealt with. Western knowledge and modern science are assumed to deal more with abstract ideas, general explanations and philoso-

phies, whereas traditional systems presumably deal with the day to day business of living. However, a closer look reveals that this type of distinction is difficult to substantiate as there are hardly any aspects of daily life in the West which are devoid of applications of general principles and abstract science. Similarly, one can think of any number of traditional systems which go beyond devising solutions to everyday problems.

At a more fundamental level, humans regardless of which part of the world they live in are intrinsically the same and are surely capable of abstract and logical thought. The argument that these systems employ different methods of understanding also doesn't hold water when we examine this along generic lines. The methodological characterisation of science as experimentation and observation (considered to be a hallmark of modern science) can be extended to include the practices of local communities which involve continual trial and error, observation of outcomes, and ultimately modification, adaptation and change. The argument that traditional knowledge is more rooted in context is often juxtaposed with the universal applicability of technological solutions put forward by modern science.

However, if we look at the variety of technologically oriented solutions that have failed, we realise that these too are embedded in a social and political context in which they work. Characterisations along a number of other angles have also been attempted. Notable among these is the insistence from some quarters that practices stemming from traditional knowledge are always environmentally sustainable. However, there are also a large number of instances where modern science has dealt admirably with contemporary environmental challenges. Another bone of contention has been regarding the value and respect that practitioners accord their own knowledge. While it is assumed that scientists and researchers proudly take advantage of their position in their communities, local practitioners are embarrassed by their knowledge and consider it lacking. Sociological studies however reveal otherwise: that a range of attitudes, positive, negative and neutral and expressed by both sides. To summarise, for every example of characterisation of traditional knowl-

edge using a particular variable or dimension, there seems to be many counterexamples from modern science and vice versa.

At a more fundamental level, humans regardless of which part of the world they live in are intrinsically the same and are surely capable of abstract and logical thought.

Again, there is the additional question of culture, blurred boundaries and shared histories as science is not a culturally disembodied form of knowledge. Western science and traditional systems have not developed in vacuums or in contexts exclusive of each other. Interactions spanning a few centuries have been recorded among many cultures of the Americas, Asia and Europe. These interactions ranging from intermittent to frequent contact, communication and exchange also make it difficult to attribute separate evolutionary pathways for different types of knowledge. For instance, Archimedes, often held up as a shining example of Western science and invention is believed to have been influenced by the knowledge systems of Egypt and Asia. *Hortus Malabaricus*, the seventeenth century treatise on medicinal plants of the Malabar Coast, which took Europe by storm is considered to be a collaboration of sorts (albeit an unequal one) between local physicians and the Dutch colonial authorities. Similarly, examples of exchange and influence between and within the West and the East abound in the fields of art, sculpture and engineering in which one, or both benefited, abound in history.

Critics caution that creating such a divide, i.e., separating traditional knowledge from modern science, could itself be problematic. The focus on

traditional knowledge has been well intentioned and has without doubt brought some of these issues into the international development arena. However, by creating such a dichotomy, we are acknowledging that the two are indeed different, regardless of the limited evidence in support of this division. It could be argued that such a demarcation could reinforce the tendency to place modern science on a pedestal and undermine the knowledge of indigenous, poor and marginalised communities. In other words, by insisting on treating them as different, we are only reinforcing hierarchies and abetting compartmentalisation. Critics also point out that ex-situ measures which are often the only solutions adopted to preserve these forms of knowledge are not the most effective ways of empowering the knowledge givers, rather they seem to be the most convenient solutions. The preservation of traditional knowledge in centralised facilities and clearing houses without the context, dynamism or milieu in which it is developed is likely to promote obsolescence and museumisation. Archiving without appropriate safeguards is also likely to resurrect barriers for those without the power to access such knowledge and bring it under the control of elites. Most critically, such scenarios warrant the adoption of effective in-situ strategies that interlink the interests of the knowledge givers in terms of power, control and autonomy. This would entail a much greater degree of political engagement - working at various levels to facilitate self-determination for marginalised local communities and developing policies that safeguard their rights and roles in the development process.

The intent here is not to add to the already voluminous literature on these issues or to polarise the debate further. Rather, this article is a call for introspection about the perceived dichotomies between traditional knowledge and western 'science' and the enormous power differentials that are a consequence of these dichotomies. It is also a call to recognise the complexities surrounding them and to move beyond these worldviews to devise a

more inclusive paradigm of knowledge.

This learning process which would bring together communities with multiple viewpoints would be beneficial from the perspective of a 'symmetry of ignorance' and an opportunity for creativity. The learning generated during such processes could be employed to develop the possibilities associated with different knowledges, to strengthen the position of indigenous peoples and local communities and to facilitate appropriate shifts in power. The differentials in power are even more exacerbated when we look at communities who are sustained by marginal spaces such as the commons and common property resources. Historically, it has been the marginalised and the poor which has been most dependent on such areas. In countries such as India, the situation is further complicated by factors such as colonialism as well as enclosure by the post-independence state, and these hierarchies are even more drastic. The revival of their knowledge systems need to be accompanied by political engagement and empowerment.

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Traditional knowledge and the management of the Laponia World Heritage site

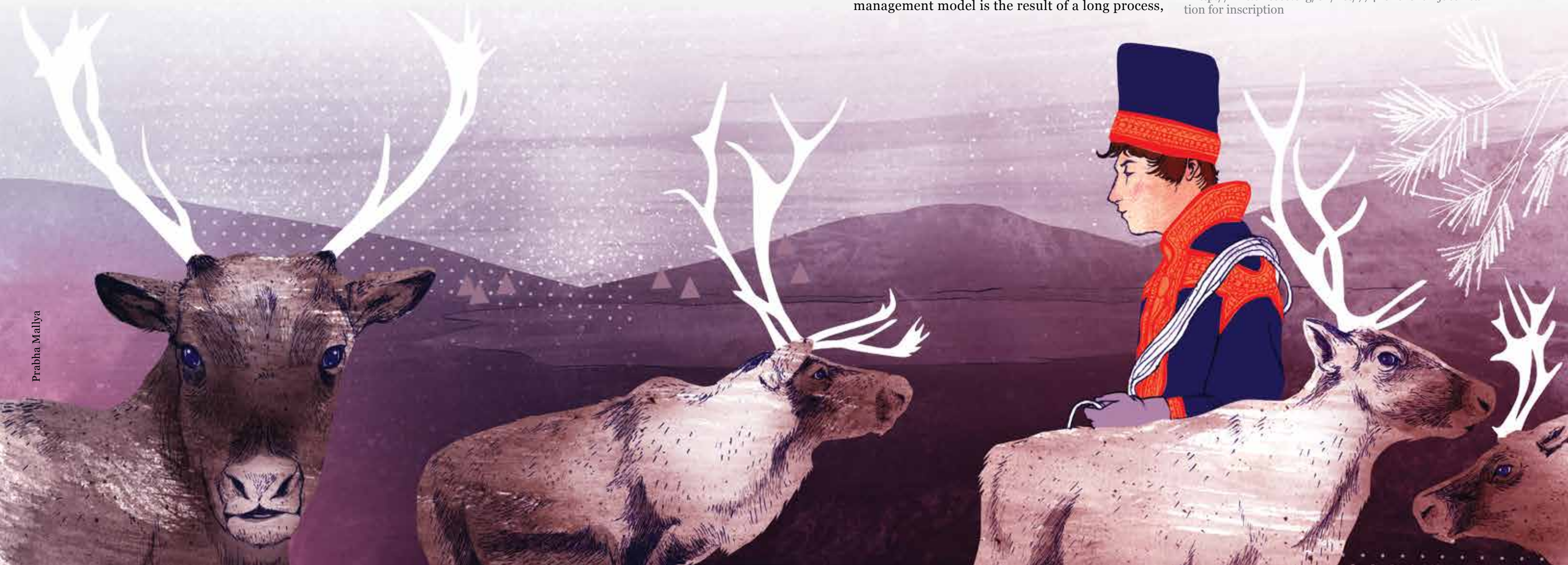
The establishment of the Laponia World Heritage site has been realised after many years of struggle. But does this ensure long-term indigenous management by the Sami?

Politicians and practitioners are increasingly recognising the traditional knowledge of indigenous peoples, not least in relation to environmental conservation and sustainable development. However, the focus is often on traditional ecological knowledge, and the possible ways indigenous environmental practices can be beneficial for the protection and sustainable use of biological diversity. Other aspects of traditional indigenous knowledge—organisational, social, or spiritual—are less commonly incorporated in natural resource management. The newly implemented management arrangement for the Laponia World Heritage site in Northern Sweden represents a unique focus on indigenous organisational knowledge, as it explicitly engages with Sami organisational practices and uses Sami concepts as guidelines for decision-making and knowledge sharing. The Sami have secured significant influence and control over the management of the site, and label it a victory for Sami political struggle. However, reaching an agreement on the management of Laponia has not been easy. The new management model is the result of a long process,

involving actors from local to international levels whose differences, at times, have seemed almost irreconcilable.

The Laponian Area was inscribed on the World Heritage List in 1996, on the basis of both natural and cultural criteria.¹ The site covers 9,400 square kilometers and includes four national parks, two nature reserves, and two internationally important wetlands. The continuous occupation and living cultural practices of the Sami—an indigenous people whose traditional lands (Sápmi) cover northern Norway, Sweden, Finland and the Russian Kola Peninsula—were crucial factors for the listing of Laponia as a World Heritage Site. Laponia represents one of the last and best-preserved examples of an area of transhumance, having been used for grazing by large reindeer herds since early stages of human development. Reindeer husbandry has historically been a central part of Sami subsistence (along with fishing, hunting, and other activities) and constitutes an

¹ <http://whc.unesco.org/en/list/774> for the full justification for inscription



important part of Sami cultural heritage. It still takes place throughout the whole Laponian Area. Based on the importance of Sami culture for the inscription of Laponia, the Sami communities made it clear from the start that they would not accept a management organisation without strong Sami influence and control.

It took 15 years to reach an agreement on the management of Laponia. The process was drawn-out and lined with conflicts. The involved parties included the Swedish state, represented by the County Administrative Board (CAB) of Norrbotten and the Swedish Environmental Protection Agency (SEPA), the two municipalities within whose territories Laponia is situated and the nine reindeer herding communities (RHCs)² whose lands are included in the site. Negotiations broke down in 2001, when the Sami representatives left in protest as they felt their claims and needs were not being heard or respected, and did not resume until 2005. In 2006, the Swedish Government commissioned the CAB to assemble a committee, with representatives from all parties, to develop a new management organisation with a strong Sami influence. After three years of negotiations, the committee presented a joint proposal for a new organisational structure for the management of Laponia—a non-profit organisation, Laponiatjuottjudus³, consisting of representatives from the RHCs, the CAB, the SEPA, and the two municipalities, with RHC representatives forming the majority of the board of directors. In 2011, the Government issued a decree allowing the CAB to transfer management of the Laponian Area to Laponiatjuottjudus, and in 2012, the CAB made their formal decision to transfer management of Laponia to the new organisation for a trial period of two years.

One of the reasons for the conflicts and collapsed negotiations of the Laponia process was that the core issue was always bigger than just the management of the World Heritage site. Laponia

² An RHC (Swe. Sameby, lit. "Sami village") is an economic association for reindeer herders, and also refers to the geographical area in which the community is entitled to pursue reindeer husbandry. Reindeer husbandry is the exclusive right of the Sami in Sweden, and membership in an RHC is a prerequisite in order to exercise that right.

³ Tjuottjudus is a term for management or administration in Lule Sami language.

became a symbol for pan-Sami mobilisation, and the negotiations echoed unresolved issues regarding Sami rights to self-determination and management of their traditional lands. The Sami argued that their traditional knowledge and historical management of the area, and their position as an indigenous people with rights determined in international law, validated their claims to control the Laponian area. Both the CAB and the municipalities supported a new, locally-based organisation, but not a Sami majority within it—and the Sami were not willing to discuss any plans for management before issues of representation and distribution of powers had been settled.

The Sami constitute a small minority of the Swedish population, historically subjected to racism, discrimination, land appropriation, cultural assimilation and forced relocation. Unequal power relations continue to influence Swedish Sami policy today, and the Sami people continue to struggle for recognition of their land rights and managerial influence of their territories. The Sami have some land rights connected to reindeer husbandry, but have to compete with other land use interests – often considerably stronger in terms of resources, influence and power. Furthermore, Sweden has a tradition of centralised environmental management schemes and low levels of local influence and control, with little consideration for traditional and local knowledge. There has been a change towards more co-management initiatives, and efforts to further the consideration of local and traditional knowledge, but results vary in terms of actual local control.

The transfer of management tasks to Laponiatjuottjudus is a unique initiative in this context, and the Sami community puts forward the result of the Laponia process as a success for Sami political struggles. As mentioned earlier, the RHCs form a majority of the board of directors. The statutes for Laponiatjuottjudus and the management plan for Laponia acknowledge Sami traditional knowledge—árbediehtu—as crucial for the conservation and sustainable development of the Laponian Area, and promote local and traditional knowledge and practices as an important part of the site's cultural heritage values. The management plan also incorporates Sami organ-

isational knowledge and practices as the basis for the management of Laponia. Key principles include *searvelatnja*—a common space for participation, discussions and knowledge-sharing, and *rádebibme*—consultation forums. Decisions are to be made with consensus; management is seen as a process that involves learning, participation and maintaining relations between people and groups; and Sami rights and Sami self-determination are attended to at length throughout the management plan. Both the process leading up to the current arrangement and the arrangement as such are then rather extraordinary within the Swedish framework in terms of both Sami influence and attention to traditional knowledge, and as a co-management initiative.

The task of managing Laponia was officially transferred to Laponiatjuottjudus on January 1, 2013. How this arrangement will play out remains to be seen. Hopes are high from all involved parties – and so are the stakes. The World Heritage listing is a construction without deep roots in Sami views of the area, but many have welcomed it as a firm confirmation of the value of Sami cultural heritage and Sami cultural landscapes. The World Heritage status is also perceived as a possible means to gain influence and control over traditional territories and the management of natural resources in Sápmi, as well as to secure respect for and incorporation of Sami traditional knowledge in environmental management. But will this have implications for the wider Sami struggle for increased rights and political influence? The case of Laponia might be too extraordinary—as Sweden's only heritage site inscribed as a mixed property, and one of only four sites worldwide representing the living cultural heritage of an indigenous people—for its management structure to inspire future changes in the management of natural resources on Sami lands.

Arising questions also include the extent of the actual transfer of management powers, the level of trust between parties, and the practical implementation of a new set of management principles in Swedish environmental management.

According to the government decree of 2011, the CAB can transfer management tasks, but not the exercise of public authority, to Laponiatjuottjudus. The management plan states that all exercise of public authority in issues related to Laponia is to be done in cooperation or consultation with Laponiatjuottjudus, but the state authorities still hold a greater deal of executive power than the RHCs. Low levels of trust proved a major obstacle in the early years of the process, causing negotiations to break down. During the latter part of the process, the parties seem to have been able to enhance trust and build confidence, and eventually reach an agreement, but conflicts go back a long way and the mutual trust might be a fragile construction. This unique arrangement is still unproven, and as mentioned earlier, Sweden has not had a great record of accomplishment of respecting Sami rights, implementing co-management initiatives, or incorporating traditional knowledge in environmental management. Altogether, this makes the next couple of years extremely interesting from several perspectives—with regards to issues of Sami rights, traditional knowledge, and natural resource management—both nationally and internationally.

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War cry

A sound reaches me through the forest. It taps into my soul until my body and mind become fully alert to the screeching. The shrill sound bounces off the charred trunks of *Banksia* and *Xanthorrhoea*. Like a war cry of an ancient army advancing through the forest. This is sacred land.

I am standing in the ochre-coloured creek bed where Dharawal¹ people have for millennia, sharpened their axes in a trickle of water running over sandstone; creating axe-grooves that my fingers are caressing as the screeching sound of a band of birds reaches me.

I look questioning at my companion, “black cockatoos?” “No, too many. You only get a handful of black cockatoos together at any one time”, he tells me. We listen while the gentle rays of the spring sun warm us. “Definitely black cockatoos”, I utter on a voice that seems as ephemeral as the gentle breeze that carries it away.

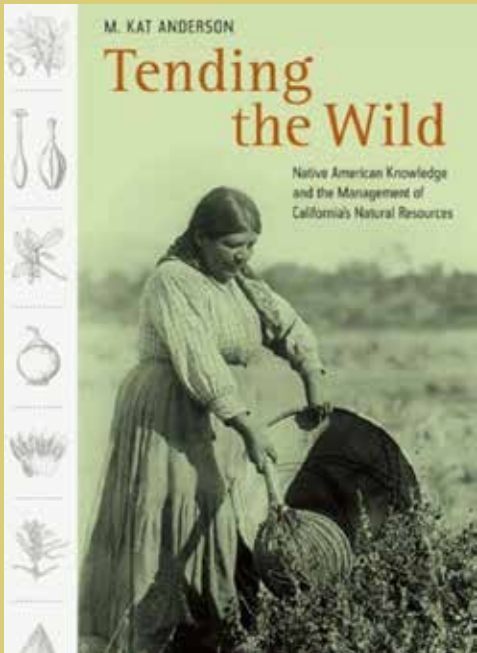
¹ The Dharawal people are the Aboriginal custodians of the Illawarra region of the New South Wales south coast, Australia.

The cry gets louder. All at once a sight of sheer beauty materialises in the deep blue sky that rises where the creek drops over the edge of the escarpment into the dense forest below. 30, maybe 40, a dense mass of black cockatoos circle overhead; delivering the message they carry from the ancestors of this country. Their presence makes time move in slow motion. Goose bumps ride like a wave up my arms. Down stream, a young Aboriginal boy flicks pieces of bark into the running water. Eight years old, it is his first visit to his ancestors’ country. A city boy by upbringing, I wonder if he realises just how unique this moment is?

It is for him the birds have come—a gathering in size out of the ordinary. They carry the spirit of Elders past, present and future to welcome him to ‘his’ country. This is where he belongs—although he is still too young and detached to know what this means.

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Modern applications of traditional indigenous practices



NATIVE AMERICAN MANAGEMENT PRACTICES WERE SHAPED BY THE IDEA THAT HUMANS ARE AN INTEGRAL PART OF NATURE

M Kat Anderson’s *Tending the Wild* has much to offer to a variety of readers. For those interested in history, it provides a succinct but informative summary of how the state and its inhabitants were impacted by the arrival of European explorers. Nature-lovers will enjoy the author’s descriptions of California’s rich biodiversity—particularly its flora. Related to these are accounts of the myriad ways in which the state’s native human populations have long utilised this wealth of natural resources in various aspects of their culture, not least of which is their cuisine. By weaving together all of these disparate threads, Anderson highlights the importance of indigenous knowledge—an incredible force once responsible for shaping California’s landscape and now a powerful tool that can potentially be used in efforts to restore, conserve, and sustainably manage a wide array of wildlife.

Early on in *Tending the Wild*, Anderson introduces a paradigm-shifting idea that will likely be anathema to many modern readers, and yet is strongly supported by the examples presented throughout the rest of the book: because humans are a part of nature, there is really no such thing as a “pristine wilderness” untouched by anthropogenic influence. Humans are, after all, an animal species like any other, requiring the use of certain natural resources in order to survive; many thousands of years after our exodus from Africa, we are as integral a part of our adopted habitats as any other species that can be found there. The main difference now, of course, is that we have a bad habit of utilising resources in an unsustainable way, thereby endangering not only particular indigenous species, but also entire habitats and ecosystems. Anderson, however, believes that indigenous wisdom can be used to break this habit and facilitate intelligent and sustainable stewardship practices.

Tending the Wild: Native American Knowledge and the Management of California’s Natural Resources
M. Kat Anderson

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University of California Press
2005

It is for this reason that the author takes an integrative, interdisciplinary approach in her book; the connections between historical, anthropological and botanical details are used to outline the long and literally fruitful history of indigenous interactions with native species. A wealth of data—some gleaned from Anderson’s in-depth perusal of the literature, others collected through interviews conducted by the author herself—suggest that anthropogenic activities such as burning, harvesting, seed sowing and coppicing played an important role in shaping the Californian landscape into the productive and aesthetically pleasing “wilderness” described by early European explorers. Ironically, contemporary conservationists wistfully long for this “pristine” condition without realizing that it only existed in the very distant past, long before the original New World inhabitants crossed into the Americas via the Bering Strait. In the time since that event, Anderson argues, indigenous activities likely not only influenced the abundance and distribution of species (particularly plants), but probably also drove the evolution of many traits that allowed wildlife to flourish under anthropogenic disturbance regimes.

Tending the Wild challenges previous ideas about the relationship between humans and nature; it also highlights the amazing wealth of natural knowledge still possessed by native tribes despite all the time that has passed since their ancestors lived solely off the bounty provided by the Californian countryside. Anderson uses her book to unite these two themes in a call-to-arms for conservationists—both those who are interested in wildlife and those who wish to preserve indig-

enous traditions. The author suggests that many historic native management practices could be re-introduced in order to improve the abundance and health of native species and habitats. This would have the simultaneous benefit of providing indigenous peoples with the materials needed, among other things, to prepare their traditional cuisines and create traditional crafts; in other words, conservation of wildlife would also lead to conservation of culture.

Anderson also points out that the majority of management goals could only be achieved through collaborative efforts involving individuals of a variety of cultural and ethnic backgrounds, thus providing indigenous peoples the opportunity to share their perspectives, beliefs, and traditions with a wide audience. One potential—and desirable—result of this might be the fostering of “a new vision of human-nature relationships and the place of humans in the natural world.” In particular, the author hopes that people of all backgrounds can come to see nature as a place and a process with which they are integrally and intimately connected, rather than something with beauty to be admired from afar, and with riches than can be greedily plundered. The latter attitudes, she suggests, will both contribute to declining ecosystem health and our own feeling of disconnectedness with the landscape, whereas the former will have countless benefits both to the wildlife and our own psyches.

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