

HEALTHY ENVIRONMENT—PRODUCTIVE ECONOMY: A CONUNDRUM?

The issue. Well before the establishment of Australia as a federated nation, concerns were raised by officials that landscapes were being degraded irreversibly. The spread of settlement post 1788 allowed land holders to apply imported skills, crops and animals to change the character of landscapes that had been the home for millennia by Aboriginal peoples and a rich variety of native flora and fauna. In the words of Tim Flannery in his Foreword to the first Wentworth Group Blueprint (2002):

*“European heritage left us appallingly equipped to survive, long-term, in this country. It left many colonial Australians unable to see the subtle beauty and biological richness of the land. What they could not understand they strove to destroy as alien and useless. For most of the last two centuries we have believed that we could remake this continent in the image of Europe [and North America] - turn the rivers inland and force truculent [ancient] soils to yield. **There are signs that things are changing for the better**”.*

This essay will examine whether things are changing for the better. If not, what can we do as a nation, as businesses, as communities and as individuals to ensure that we can live prosperously in an ever-changing world, one where use of our natural capital demand actions that do not continue to degrade those natural resources, our natural capital, upon which we depend for both our livelihoods and lifestyles.

Personal context. My formative years were the 1950s. As a teenager, I soaked up influences of both city and country life learning about environmental issues as a student of geography at Sydney University. The 50s were a period of optimism as Australia had emerged successfully from the initial years of post-war reconstruction. Despite some significant differences, both major political parties took steps to enhance economic growth, to foster migration, improve education from primary to tertiary, and invest in what at the time were seen as great programs of national significance such as the Snowy Mountains Scheme.

Two magic summers were spent in the Snowy Mountains as an undergraduate research assistant with a CSIRO team involved in long-term measurements of ecological change following de-stocking. It demonstrated three things, one, the importance of investing in a multi-decadal, scientific monitoring program led by a respected scientist; two, how that work in collaboration with a NSW Government agency, the Soil Conservation Service, could overcome the devastating erosion impacts of grazing on fragile ecosystems; and third, the power of science, involving CSIRO and the Academy of Science, in constraining the ambitions of zealous engineers who were planning dams and pipes in areas above the treeline. I also benefited from arrangements to meet other CSIRO staff committed to national investigations of land use capability and to see for myself how teams of scientists could provide information on the unique characteristics of Australian landscapes.

But I was also a creature of the city. Growing up in the red-tiled houses of eastern Sydney, from which much native fauna and flora had been removed, caused me little concern in early years. I was quite content with games in streets devoid of much traffic, and with ready access to Bondi and harbour-side beaches. To swim in the

harbour was not always pleasant as the body often got a coating of oil; an experience also noted by swimming great, Murray Rose. Pollution and weed smells became an increasing issue especially after rains. Drains were places to avoid. In the 40s and 50s, coal and wood fires were common and the home got its annual coating of soot. The atmosphere, while not as disastrous as London, had its awful smoggy days. This was a period when manufacturing was entering a new growth phase in our cities being protected by a tariff wall. Regulations regarding disposal of waste were at a minimum. One consequence of this slackness in environmental protection was the discharge of toxic industrial and sewer wastes into coastal and estuarine waters. It is no wonder in retrospect why I enjoyed escaping to the Blue Mountains and west of the divide to Orange during school holidays.

These youthful reflections serve to remind me that while our country has done some remarkable things we have inherited legacies that make for difficulties if we seek to sustainably manage our natural capital. On the one hand, there are legacies of degradation, while on the other we see efforts at various scales to understand how to better adapt to Australia's unique environmental conditions so poetically captured by the phrase "a land of droughts and flooding rains". Given the diverse geographical conditions that prevail on land, and adjoining seas, the question is what it will take to do business, in both rural and urban Australia, so that our soils, freshwaters, biodiversity and variable climatic conditions are used sustainably now and in the long-term. Do we have sufficient knowledge, and a will to use that knowledge, to set directions at national and regional scales, to apply land use practices that are in harmony with environmental conditions that are intrinsic to Australia? This can be seen as a new question, but what is old is new again!

Over the past two centuries many have tried to make changes for the better, some have succeeded brilliantly creating great wealth for themselves and for the nation. Others have failed and left legacies of personal despair and degraded lands. Much has been written on the environmental history of our landscapes and seascapes and how that history relates to our broader economic, social and political history. Historians (Roberts, Hancock, Pyne, McKernan, McCalman), historical geographers (Heathcote, Powell, Jeans, Meinig, Williams), environmental scientists (Seddon, Cullen, Flannery, Dovers, Lindenmeyer), authors and biographers (Facey, White, Winton, Flanagan, Watson), and poets (Wright and Murray), to name just a few; they have provided us with a deep understanding of the past with lessons for the future. Their works demonstrate the capacity of many settlers with and without government support to innovate and adapt to Australian conditions; the story of the Kidman cattle empire as told by Idriess and others is a good example. But there are also sad and even sordid stories of dispossession, conflict over land use, loss of biodiversity, invasion of feral animals and weeds, contamination of land along with the over-exploitation of water resources.

Historical background. I have selected four examples from our history to illustrate how controversies arising from use of seascapes and landscapes have triggered changes in public policy, and how these lands and seas have been managed or attempted to be managed given the changeable and changing biophysical character of our nation.

The first takes me close to my childhood home, Bondi. In the early 19th century, Governors in NSW were able to offer land grants to favoured individuals. One grant covered the dunes behind the beach at Bondi. From 1811 to 1882 this was private land. Successive land owners with the help of friends in the Legislative Council fought to retain that exclusive property right. It took 30 years after the establishment of Waverley Council in 1852 to bring Bondi into the public domain and get public access to the foreshore. Pressure grew on the legislature as the need arose to offer citizens from the crowded areas of inner Sydney access to areas for public recreation; Bondi was seen as ideal for this purpose and tracts of land were compulsorily acquired. But as Caroline Ford points out in her recent history of Sydney beaches, this was an ugly struggle.

Protection of property rights continues to remain a powerful driver in land use decision-making often with the support of governments. We do not have the public trust doctrine in statute law to help protect the public good. The legacy of property sub-division along the coast in areas vulnerable to loss of land to the sea will undoubtedly see land owners petitioning for governments to build sea walls to protect their land even at the expense of loss of public beach. This is already happening. Lessons from overseas tell us that unless these property interests are somewhat curtailed, Australia is in for some very expensive and demanding legal battles as sea levels continue to rise. But at least Bondi Beach was saved from the hands of private developers!

The second example draws me to one of my favourite books: *Coral Battleground* by Judith Wright. Here one of our greatest poets shows how an individual garners support against the forces of government, industry and even scientists, to SAVE the Great Barrier Reef. This is a story of the mid 20th century, reviewed in detail by Iain McCalman in his recent history. He states:

“Judith was a romantic in the profoundest sense: someone who strove through the power of language, myth and symbol to absorb the harsh beauty of the Australian continent and the environmental ethos of its Aboriginal peoples”.

Her book captures the struggle to ward off mining interests both for limestone and oil. Driven by the Premier, Joh Bjelke-Petersen, the Queensland Government authorised the Minister for Mines in 1968 to have the entire length of the Reef zoned in preparation for leasing. Wright worked with the Wildlife Preservation Society to mount what became a national campaign to prevent any mining. In this endeavour she was supported by a CSIRO scientist, Len Webb, who often found himself at odds with development minded colleagues in that organisation. Fortunately, these so-called radical conservationists found support in Canberra with a Coalition Government determined not to sacrifice the national heritage defined by the GBR, and this subsequently led to negotiated agreements establishing the Great Barrier Reef Marine Park Authority with its innovative marine zoning planning scheme. Yet the battle for the Reef is not over with pressure from land-sourced pollutants, dumping of spoil from ports that are linked to coal mining developments inland and the insidious impacts of global warming, ironically induced in part by burning of coal.

The third example takes us back on land and into the 19th century. Even by the later half of that century, colonial governments believed that vast tracts were devoid of European settlement. The mantra of “closer settlement” has had many consequences as policies emerged to foster expansion of agriculture land holding into pastoral

leased lands. An example is in South Australia where an experienced surveyor, George Goyder, set out to influence the pattern of land use north of Adelaide. In the words of Joe Powell:

“Goyder wrote his indelible signature across the landscape of South Australia...His ‘line of reliable rainfall’ was adapted by the government as the northern limit for safe agricultural settlement...Ignoring official warnings, pioneer wheat farmers moved beyond ‘the Line’, luckily encountered a run of good seasons, and jubilantly endorsed the pseudo-scientific notion that their intrusion had produced an amelioration in those harsh areas—hence the resort to the popular myth, ‘rain follows the plough’. When the droughts returned with a vengeance, many of the settlers abandoned their holdings”.

From this period many lessons emerge. Abandoned land cleared of native vegetation still bares the scars of the pioneers encouraged, at least temporarily, by a government keen to reap the benefits of land sales and excited by the prospects of economic returns from wheat exports despite the reservations of Goyder. Farmers were learning to the hard way; one is quoted as saying in 1882 “like many others, I thought that the rain follows the plough, and I paid dearly for my folly”. Goyder had the foresight to read the landscape and inferred from the boundary of salt bush and arid scrub a long term indicator of rainfall reliability. There was no magic “normal” rainfall upon which farmers could rely in these marginal zones; use of the land demanded adaptation to the cycles of drought and higher rainfall period that we now associate with the comings and goings of El Nino. The nation was to experience more devastating hardship on a greater scale in the 20th century from these cycles.

The fourth example takes us to one of the saddest periods of Australian land history that occurred after World War One. I refer to the Soldier Settlement Scheme, seen as a “debt of honour” to returning servicemen who had suffered so horribly in the “war to end all wars”. Here the nation could repay this debt by offering land with the promise of an independent life, “shot of bosses”. Historians such as McKernan have picked up the story:

“The governments, state and federal, understanding the impulse, and wishing the best for these brave and gallant men, fell in with their dreams and opened up vast tracts of land for small-scale farming. Good land? In some cases certainly, but in most cases no. Marginal land and small blocks, too”.

It is now clear that most of these soldiers were unprepared for what lay ahead, droughts, the depression, lack government support and of course their own health, the consequence of years at war. In particular, argues McKernan, drought was like war: ‘it was about despair, depression, powerlessness, a sense of unfairness of it all, of life so unpredictable and cruel that it would fathers to suicide, mothers to depression and children to acute anxiety’. Sadly these social costs have recurred in rural communities in later years despite the fact that by now drought should not be seen as an ‘indignant surprise’. Powell has discussed the factors that are generally attributed to the so-called ‘failure of the scheme’, factors familiar to many who live in regional and rural Australia today. He lists falling prices; high costs paid by settlers; capital debt burden; locational decisions often on land unsuitable for a particular type of farming and abused as a result; farm sizes set by officials; selection of settlers with limited experience in farming; and Commonwealth-State relations (‘a perplexing tangle’). A similar settlement scheme followed World War Two, this time coupled with a broader vision of post-war reconstruction. It proved more successful especially in irrigation

areas developed in the Murray-Darling Basin. But there are key lessons about the sustained role of governments in supporting farming and rural communities in a continent where we know there are physical, as well as economic and social, constraints on different land uses.

Lessons from history. These four historic examples resonate today and offer lessons for future land use and conservation decision-makers especially as we enter an era of great climate uncertainty. Some key points that emerge are as follows:

First, the story of Bondi shows the entrenched power of property rights and the way individuals with influence can achieve personal gains at the expense of the public good. We see many examples of this expression of “rights”: for instance, in demands to clear native vegetation from “my” land; in pressures on governments to allow developments in hazardous locations and then seek public funds to protect “my” property from adverse impacts of an extreme event even when such protection leads to loss of public amenity or environmental values; and even in corporate forces behind exploration and investment to extract minerals leading legacies of land and water degradation. All this calls for strong regional strategic planning.

Second, advocacy by individuals and groups for environmental protection can make a difference. We have seen many examples of this in Australia often with great personal sacrifice. Judith Wright does not stand alone; there are those like John Sinclair of Fraser Island fame who also encountered the wrath of the Queensland Government; Tim Winton who fought for Ningaloo; and all those who have battled for rivers and forests in Tasmania. These committed folk garnered broad community and then political support to achieve lasting conservation legacies of which we are very proud. But there is always the need for eternal vigilance because forces exist to change these outcomes for commercial gain that could have devastating outcomes.

Third, expansion and contraction of agricultural settlement in South Australia offers many salutary lessons in adjusting farming to our climatic conditions and fragile soils. Good public policy may emerge based on the best available knowledge such as that available to the remarkable Goyder in the 1860s. But the short-term prism through which a government may make decisions, no matter how scientifically sound the original decision may be, can lead to a switch in policy to advantage certain groups at a point in time. As climate shifts back from wet to dry in these “marginal” lands then there are disastrous environmental, social and economic consequences. Knowledge of such consequences must be ingrained in the bureaucracies so that frank, fearless and transparent advice is available to avoid decisions that expose rural and even urban settlement and land uses to hardship.

And **fourth**, government intervention even with best of intent can make some terrible mistakes that have long lasting legacies, especially if there is not on-going support. Soldier Settler programs are a poignant example. Decisions made at moments of crisis can lead to regrets long after the crisis has passed. Under pressure governments have given away water at very cheap rates to help rural industries only to later discover that the resource has been over-allocated. Weeds such as bitou bush have been planted, and cane toads introduced for what at the time seemed to be good reasons, but look at the effects. Control of rabbits and prickly pear cactus shows what we can do to eradicate or control pests if there is a will. Science has been critically important in making some of these ‘improvements’ possible. We in the Wentworth Group, led by the late Peter Cullen, are very proud of our advocacy to prevent more rivers being turned inland at the height of the “Farmhand Crisis” in 2002. Our scientific understanding and credibility allowed key decision-makers to take a deep breath

before not committing the nation to fund infrastructure that could have had long-term disastrous consequences, not unlike some of the harmful effects seen in the Murray-Darling Basin with the Snowy Mountains Scheme.

A hundred years ago, a geographer working for the Bureau of Meteorology during the Great War commenced his insightful work on defining the limits to settlement and to agriculture. Thomas Griffith Taylor, whose image later appeared on a postage stamp, found himself pilloried by many in the 1920s when he was a Professor of Geography at Sydney University. He even had a text book banned in WA because of his strong science-based views on the constraints to rural growth in that state. He knew then, as we know now, that the nation's soils and climatic conditions are not the same as Europe and North America and thus do not provide similar opportunities for population growth and economic development. This was very hard for politicians to accept at that time, but his projection of 20 million by 2000 was pretty close to the mark and way below the dreams of those seeking 100 million, the so-called "boosters". He made it clear in later publications that:

"The wise statesman is he who moulds his policy in harmony with the varying environment for which it is his privilege to legislate". (1925)

And for me personally:

"The best economic program for a country like Australia to follow has in a large part been decided by nature, and it is the geographer's duty to interpret that program". (1940)

A way forward? At the beginning of this essay, I quoted Tim Flannery in 2002 as saying that there are signs that things are changing for the better. But Tim has also said in a QE in 2003 that *"In the light of Australia's dire environmental danger, it is reasonable to ask whether the nation can continue to sustain itself in the medium to long term"*. These two statements reflect a conundrum that we all face and for which we need solutions. The Wentworth Group seeks to rephrase the debate from one of adversary between environmental benefits and economic growth to one where we move towards outcomes that achieve a **Healthy Environment and a Productive Economy (2014)**. This is the title of a *Blueprint* in which the Group sets out a set of interrelated actions/ reforms that we believe must be taken to further promote change for the better so that the nation will sustain itself in the medium to long term and thus avoid persistent conflict between those seeking to add to the nation's wealth and those seeking to protect environmental values.

Many institutions and individuals have made a case for thinking and acting strategically with an eye towards long-term benefits. This thinking was a foundation stone in the work undertaken by governments in the late 80s and 90s on sustainable development. In Australia, this thinking evolved into the concept of ESD or Ecologically Sustainable Development. Legislative changes were made at state and federal levels to incorporate the principles of ESD into law and policy. I was personally involved in assisting the NSW Government incorporate these principles in 1997 into the NSW Coastal Policy and amendments to the NSW Coastal Protection Act 1979. One key ESD principle was that of intergenerational equity. This required consideration in matters related to development of long-term consequences and benefits; for some it underpinned the concept of maintaining and improving environmental assets. One could see that these principles if acted upon would create change for the better.

ESD and its application have not gone unchallenged. Many decision-makers and developers believed and demonstrated that it impeded investments, job creation and profit generation now. “Short-termism” has prevailed as governments at all levels have used a variety of powers, under pressure from vested interests, to side-step ESD principles as a matter for consideration and invoked other measures to get things done for those interests. From time to time, ESD has been used in the courts to delay or even stop rushed developments, but this has not stopped actions occurring that have had poor environmental results. It goes even further as we have discovered many in power in politics, bureaucracy and commerce do not see value in having “healthy environments” if such an objective impedes development and is perceived to impact adversely on job creation. It is not self-evident that there are economic and social advantages in securing healthy environments as beneficial to society as a whole. As noted above, the ugly side of mantras on property rights, jobs-jobs-jobs, immediate maximisation of profits informing an ever voracious stock market, and the push to lower taxes at times of budget surplus, is all so politically compelling that the environment often gets whipped.

How can we turn these short-term attitudes into something the nation deserves, a vision and a set of accompanying reforms that promote for the nation’s long-term prosperity a healthy environment and a productive economy? Given that we face an array of environmental challenges that are most likely to become more and more challenging in the decades ahead, and given the potential for other future shocks arising from global forces, it is imperative that these short-term attitudes and their apparent benefits to certain sectors of society be conditioned by an understanding of what is needed to achieve a more sustainable future.

Assumptions. The framework for better management of Australia’s natural capital in this essay is built on five assumptions. Questions can be raised about each assumption and what each implies. Nevertheless, they form a starting point from which a case can be developed for both institutional and economic reforms that will enhance our prospect for a healthy environment and a productive economy.

Assumption 1. That Australia will not suffer from any global military, mass migration or financial crises that could disturb the continued operation of our democratic system.

Assumption 2. That population growth will continue for at least the next three decades at rates similar to that of the last decade; its demography will follow that outlined in the recent Intergenerational Report; and growth will remain concentrated in certain coastal centres and major cities.

Assumption 3. That there will be continued pressure to sustain economic growth as a matter of accepted policy of the major political parties driven by commercial interests, the need for revenue growth, and a belief that such growth is needed to ensure low levels of unemployment.

Assumption 4. That current governance arrangements and legal systems as defined in the Constitution will be maintained with roles and responsibilities to change only as a result of national political agreements.

Assumption 5. That climate will continue to change, potentially in a non-linear way, and that given the nation’s vulnerability to climate change, increasingly governments and commerce will see the necessity of having their decisions informed by science.

As succinctly put by the Director of the Bureau of Meteorology, Rob Vertessy, in

2015, “Australians must contend with the world’s most acute rainfall and runoff variability”. When this point is taken in context with IPCC AR5 projections for temperature, rainfall, soil moisture, sea levels and ocean conditions, it would be totally irresponsible for any decisions that involve the medium to long term to ignore the science.

Five reforms. In the 2014 Blueprint, the Wentworth Group describes the magnitude of the environmental challenges Australia faces while establishing the case that it is possible to grow the economy and protect the environment. Five long-term institutional and economic reforms are outlined to achieve this outcome. They are:

1. Fix land and water use planning at a regional scale to address cumulative impacts and implement long-term strategic policies.
2. Use markets more effectively to transform the way we manage the Australian landscape.
3. Conserve natural capital.
4. Regionalise natural resource management to ensure investment decisions are better underpinned by an understanding of landscape function.
5. Create regional scale environmental accounts that can offer better information on changes to the condition of environmental assets for use in regional and national decision-making.

These five reforms define a pathway we can follow in order to leave our world in a better condition than the one we inherited, and in doing so make Australia a more secure place for future generations. Each reform has its basis in history and geography, and in our collective understanding of processes of change and what we think is feasible and viable for the “long haul”.

Planning. I have already made reference to the way the GBRMPA developed and implemented strategic plans. The scale and success of this work is amazing. It has demonstrated the capacity of the nation to have government’s cooperating to achieve planning outcomes that benefit both the economy and the environment. Now one might argue that this has not prevented some deterioration of reef values or incessant pressure from land based developments and uses, but it is a model that has enormous promise.

Where strategic planning becomes more difficult is on land. State governments have the constitutional responsibility to undertake land use planning and in legislation there are various provisions for regional plans. The problem is that plans of this type and scale do not generally carry sufficient statutory power to integrate activities of different agencies of government and to drive long-term outcomes that embrace cumulative impacts of development. This despite inclusion in legislation of the principles of ESD! Proper, strategic, regional plans require all land use interests and responsibilities of governments, state and local to achieve a degree of integration in forward thinking that is very uncommon in this country. This means that collectively governments develop a regional plan with community consultation that embraces property uses, infrastructure, transport, disaster, water uses, biodiversity and a capacity to adapt to potential climate change impacts such as sea level rise. Here we seek the “holy grail” of planning. It must be costed for periods up to 30 years, subject to 5 year reviews, and be built on the vision for a region’s population and employment growth while maintaining or improving the condition of environmental assets. All this

is not impossible if driven politically by leaders who can assert power over the domains of all those silos in government that seek to champion their own outcomes often at the expense of others. The best example we recall is that for SE Queensland region during the period when Terry Macinroth was Treasurer and Planning Minister in the early 90s. But subsequent governments reverted to old disintegrated ways.

The Australian Government is not directly involved in land use planning. However, there are opportunities, if not necessities, for it to take a more proactive yet collaborative position in determining regional plans. One is through its role in NRM, in particular in the development and evaluation of Catchment Management Plans working with regional NRM entities in each state. Federal funds are spent in NRM through these entities and the Australian Government has to ensure efficient and effective expenditure of those funds. The other involves reducing federal expenditure on natural disaster recovery. This is a matter recently reviewed by the Productivity Commission and recognises the great imbalance between post disaster costs to the taxpayer and pre-disaster mitigation of disaster impacts. The latter should involve land use planning. As stated by the PC:

“There is a need to transparently incorporate natural disaster risk management into land use planning” (p.2); “State and local governments have not given sufficient consideration to natural disaster risk in land use planning” (p.36). And as noted by the Wentworth Group and others in submissions to the PC, these risks are highly likely to be exacerbated by climate change in Australia. This point was made clear with respect to climate change risks facing the Australian coast in the first pass assessment conducted by the Australian Government (2009, 2011).

Another area involving the Australian Government is in water planning. Water management has been and remains a contentious matter especially with the abolition of the National Water Commission and the COAG on Water and Environment by the Abbott Government. At a national scale there is a need for understanding the use and abuse of water resources, surface and groundwater, a task well suited to an independent Commission. In a regional context, the over-allocation of waters in the Murray-Darling Basin has been a source of conflict for around 100 years. The Wentworth Group has had much to say on this issue, in particular the need to sustain flows over time that protects the environmental health of waters from source to mouth. Water planning has required extensive consultation in order to achieve an agreed use of waters for urban, rural and environmental purposes, including mining and extraction of coal seam gas. Different parts of the basin have different requirements depending on demands, state of flow and conditions of aquatic ecosystems. Here is where integrated planning in catchments becomes important as cumulative impacts of allocations and changes in flows for interconnected rivers and groundwaters must be taken into consideration if the overall water health and agricultural productivity is to be sustained. This becomes even more critical if there is to be decline in rainfall and soil moisture across the southern half of the MDB under climate change.

Fundamentally, our case for integrated regional land use and infrastructure plans rests on benefits to the economy, to social conditions and environments. By providing more certainty to investors, by reducing adverse impacts of natural disasters, and by ensuring different uses of land do not have negative impacts on the property interests of others, the economy must benefit in the medium to long term. Infrastructure

planning must be linked to population growth projections in ways that facilitate outcomes that improve access, availability of land and water for recreation, reduces congestion and promotes social cohesion not conflict. This is not to say there will not be battles at a local level. However, good strategic planning will define the many benefits that can evolve with time. Clean air, clean water, efficient waste disposal, use of renewable energy, protection of high value agricultural land and opportunities for communities to learn and understand the benefits of nature, their natural and cultural heritage, should all be part of what we expect governments, businesses and communities to deliver in a cooperative way. A mechanism is statutory regional planning to help achieve closer harmony with Australia's unique, but ever-changing environmental character.

From the perspective of the Wentworth Group, four opportunities are identified in relation to reform of land and use planning:

1. Greater emphasis to long-term, regional scale, integrated, **land use planning**.
2. Encouraging **innovation in towns and cities** to improve liveability and sustainability.
3. Recognising **risks** from extreme events and climate change in land use plans.
4. Continue to develop and implement **water reforms** recognising the scarcity of this resource and implications of climate change on water availability.

Markets. Planning is one element but the reforms must also address behaviour of markets, including subsidies, taxation and certification of products. Many market activities can be shown to damage the environment. A good example is the way farming may cause land degradation involving the loss of ecosystem services that benefit nature and human well-being. Wentworth Group in 2002 set out as one of its key changes for us to live in harmony with nature to:

“Pay farmers for environmental services (clean water, fresh air, healthy soils. Where we expect farmers to maintain land in a certain way that is above their duty of care, we should pay them to provide those services on behalf of the rest of Australia”. Cumulative impacts of individual decisions are often masked within the production of goods and services that people consume. We are not fully aware of these long-term, degrading impacts such as salinisation of rivers, or the loss of soil carbon. These must be seen as public good values. No individual or business owns them, but they are part of the nation's natural capital and as such they have “values” which are not priced by the market. Yet their degradation generates costs which present and future generations must bare.

So the question arises as to how in the broader public interest can we create economic conditions for these impacts to be incorporated into the cost of doing business. This is not a new question. Since the 1950s Australians have accepted many costs added onto the purchase price of goods and services often in the interests of improved public health. The aim was to give us cleaner air free of substances that produced those foul smogs, and cleaner waters free of toxins that previously were discharged into the sea, estuaries and rivers. It may have been individually less expensive to have operated in a “free” market world with cheaper products and services if governments over time had not intervened and used regulations or built costly infrastructure for the public good. An example is the construction deepwater sewer outfalls off Sydney in the 80s. Initially, the agency responsible, Sydney Water Board, argued they were unnecessary

on the grounds of cost and need, but the community was prepared to carry the additional expense to stop what Sharon Beder characterised as a period of “toxic surfing”.

History teaches us that Australians will pay for clean air and clean water in certain circumstances. But various studies have shown that the cost of repairing the broader suite of natural resources across the vastness of the continent currently exceeds \$100 billion, or around \$5 billion each year for 20 years. These figures sound high given current budgets of different levels of government. But there are ways to improve our capacity to use markets and finances to target those areas where investment in maintaining and improving natural assets will make our economy more productive in the long term.

The Wentworth Group has identified four opportunities to use markets at a scale that can improve our national capacity to create healthy and productive landscapes:

1. Applying a **duty of care**, on both private and public lands, in rural, regional, periurban and urban Australia, so that future actions of individuals, businesses and governments result in no net long-term harm to the nation’s environmental assets.
2. Setting an effective long-term emissions reduction target with a price on carbon to encourage **carbon farming** in areas that are designated as suitable in regional strategic plans (as informed by NRM catchment plans), in order to facilitate better management of the Australian landscape.
3. **Eliminating fossil fuel subsidies** that cause pollution and replacing them with a more efficient and equitable land tax that will help support initiatives by farmers, indigenous communities and other landholders/managers (including technical support for volunteers and NGOs), to restore and maintain environmental assets in a healthy condition consistent with NRM catchment plans.
4. Developing a voluntary, industry-based **farm certification**, supported by strong and effective regulation, designed to achieve best practice “clean products” that demonstrate with confidence that Australian agriculture seeks to minimise on-farm and off-farm adverse impacts, so that suppliers, retailers and consumers in Australia and overseas will be in a position to pay for the benefits of farmers/fishers managing their lands and marine waters sustainably.

These four opportunities sit within the broader model proposed by the Wentworth Group for governments at all levels to place a top priority on Australia’ future while still maintaining living standards of today. To move towards a more sustainable future the challenges of past degradation combined with climate change, population growth and current institutional arrangements require us to move towards a system that step by step eliminates those negative effects that work against environmental goals or generate perverse incentives that undermine environmental policies and regulation. We intervene in markets now, but how we do it can lead to further diminution of our natural capital; these four opportunities present us with another way forward.

Natural capital. Successive national State of Environment reports have lamented on declining condition of native fauna and flora in Australia. Persistent pressures arising from land clearing, urban development, introduction of invasive plants and the spread

of feral animals have all contributed to loss of biodiversity. But so has the way in which our lands and seas have been managed thereby allowing loss of soil carbon and its constituent biota, influx of nutrients into waterways stimulating a change in composition of organisms that make up food chains, over-extraction of water and fish, changes in the use of fire, and how cloved hoofed animals have impacted adversely on ecosystems. Extinction has claimed already around 100 species and 1600 species are threatened with extinction.

Yet Australia is still very rich in species with 90% plant, 90% animal and 50% bird being endemic to this continent. Our seas are also rich: Sydney Harbour alone with its 571 fish species exceeding that found in the entire Mediterranean Sea. This national heritage has evolved over time with distinctive communities adapted to the slowly changing conditions of climate and soil as the continent dried post Gondwana. Understanding geology is one way to unlock some of the mysterious of the ecological patterns because these patterns reflect rock weathering, soil and climatic factors that for very long periods have remained little disturbed unlike those northern hemisphere continents from which settlers came that were ravaged and reconstituted by the forces of glaciation. It behoves us to learn more about these patterns and what sustains their resilience to floods, droughts, fires and use by indigenous Australians.

My personal exposure to ecosystem conservation stems from a range of experiences. First, my work as a natural scientist has alerted me to ecological links between plants and landforms in coastal areas; here I have seen the need to restore native species on dunes and in mangroves where mining or agriculture has destroyed landscapes. Observing the impact of coral bleaching makes one acutely aware of the importance looking at ways for coral and dependent organisms to adapt to the forces of global warming.

Second, devastation due to planned and unplanned introduction exotic plants which later flourish as weeds. For several years I chaired the national Bitou Bush and Boneseed committee. These were declared WONS (weeds of national significance), one of the very few WONS that were not seen as a problem for agriculture but a problem for natural systems. Weeds cost farmers around \$1.5 billion a year in weed control activities and a further \$2.5 billion a year in lost agricultural production. The real cost to the environment is difficult to calculate.

Third, I have participated in several cross-discipline activities that point to the need to better understand changes over time to native fauna and flora. My role as an undergraduate in monitoring alpine flora has already been mentioned. The work of an Academy of Science committee in 1992 pointed to the value of establishing long-term research sites, an idea more recently taken up by David Lindenmayer and his colleagues in the development of a strategic plan for an Australian long-term environmental monitoring network. As Chair of the national SOE, 2001, I was appalled at the continued sad news of loss of biodiversity from land clearing and salinisation. And as will be discussed below, work by the Wentworth Group on environmental accounts offered a further mechanism to understand such issues.

Despite significant investments over many decades by federal and state governments, there has been no observable slowing in the rate of biodiversity loss because the main causes driving extinction have not been addressed. Even with new laws and grand

programs, we do not seem able to achieve the goals to restore viable populations of the vast majority of threatened ecosystems and species. Programs such as Landcare and Coastcare; attempts to improve the health of waterways in all states; and the vast array of project activities of NRM entities and those state agencies responsible for managing national parks, have all achieved some positive outcomes. However, we have grave doubts that these efforts are sufficient to ensure the passage of our extraordinary natural heritage as observed today to future generations.

What more can be done? The Wentworth Group has identified five opportunities to reverse the decline in national capital as expressed by its biodiversity:

1. Strengthening **national standards** for application by governments to new developments to ensure environmental assets are maintained or improved.
2. Completing the national system of **public and private reserves** and indigenous protected areas with support to go to landholders that have covenants placed on their properties to protect areas of high conservation significance.
3. Establish a national **river (and estuary) classification** system that recognises environmental values of these waterways and their catchments (linked to strategic land use plans).
4. Committing to a **long-term (20 year) plan** to protect and restore viable populations of threatened species and ecosystems.
5. Improving the **health of ecosystems** so that species have the best possible chance of adapting to climate change including the introduction of monitoring change to ensure that changes to environmental conditions are carefully tracked and understood.

Regional approach. An aspect of Australian history that from time to time captures the imagination of communities, politicians, bureaucrats and academics is what could be described as ‘*regional thinking*’. There have been numerous expressions of ‘regionalism’ since the beginning of white settlement. For some this was focussed on water management as natural management units, and was aligned to regional movements in the USA related to the engineering of river basins such as the Tennessee Valley. But as Powell has noted, the Labor Party showed such interests back in the 1920s:

“Within the ALP there seemed to be an infatuation with the regional concept and above all with the mystique of the ‘natural region’. In 1920 the federal ALP produced a pamphlet showing a proposed division of Australia and New Guinea into 31 regional provinces”.

Water engineers such as T.A. Lang articulated a vision in 1944:

“Only in recent years has it been recognised that there are sound reasons for adopting a regional basis, rather than a political one, when planning the development and management of natural resources and the most beneficial use of human resources”.

At the same time, there was consideration within governments for plans to introduce regional reforms as part of post-war reconstruction. James Macdonald Holmes, Professor of Geography at Sydney University, was closely connected with politicians at this time. He was a staunch proponent of regional thinking as outlined in his book *Geographical Basis of Government* (1944). According to Powell:

“He wanted to see the reconstruction of a management hierarchy in which the national government was the coordinator of a more relevant and infinitely more

resilient lower tier based on regions”... “His proposal was seeking to build a dynamic framework in which ordinary citizens would be more creatively engaged in local, regional and national affairs”.

These were grand visions, in part captured politically by the ‘new state’ movements of the 50s and 60s. But they lost momentum as state government agencies asserted more and more authority in natural resource management while the federal government, along with some states, focussed on one great national program, the Snowy Mountains Scheme.

One could argue that the vision returned during the Howard Government with the sale of Telstra and the introduction of Natural Heritage Trust. Federal funds were now available for natural resource management on a national scale. In cooperation with the states, 56 regional NRM bodies were established to work with state agencies, local governments, farmers, NGOs, indigenous communities, and thousands of community groups with a passion for public land conservation. The fact that these NRM bodies still exist (now 54), even in more straightened circumstances, is testimony to the desire of communities that possess a shared identity and a sense of purpose that transcends political boundaries, to continue to function at a scale that has meaning in relation to the unique characteristics of their lands and waters.

Diversity of landscapes and marine areas highlights the folly of any federal or state policy that adopts a ‘one size fits all’ approach to NRM policy or implementation. This should be self-evident given our geography and lessons from history. But sadly that is not always the case. In my experience this folly often flourishes to the detriment of our landscapes. Some examples include the demise of extension officers in Departments of Agriculture rich in knowledge of local areas; the application of the ‘command and control’ approach dictated by central office to satisfy power interests of top bureaucrats and auditors; the demand of staff to comply with rigid procedures in reporting and achieving instant ‘outcomes’ reducing flexibility in adjusting implementation to changing rainfall/runoff conditions; the imperative to maintain production during droughts to satisfy banks; and frequent changes in staff in bureaucracies with little expertise in areas demanding technical backgrounds.

What can we do to rejuvenate a new era of managing the Australian environment with industries and communities working in harmony at regional scales to improve the nation’s capacity to sustain lifestyles and livelihoods in the face of new challenges? The institutional setting is in place with the existing 54 NRM regions. At the moment there are differences in focus and management practices and degree of accountability between states. Members of the Wentworth Group since 2002 have had close working relations with NRM regions in all states. We appreciate how farmers, indigenous land holders, rural businesses, community ‘care’ groups and local state government employees, identify with ‘their’ lands and waters. Hours and hours of volunteer efforts are undertaken each year to improve the health of their environmental assets; there is no reason that we can see that impediments be put or remain in place to suppress such passion and commitment. As noted above in the discussion on use of markets, there are ways to better direct financial and technical resources to assist grow regional capacities to contribute to healthy and productive landscapes.

It makes no sense to downsize or otherwise frustrate regional NRM entities as has occurred over the past decade in Australia. The Australian Government in cooperation with the states have the powers to facilitate connections of people to the lands and waters that they know, that they identify with and seek to achieve outcomes that are sustainable in the long term. We do not want these entities burdened by bureaucratic demands; rather they be put in a better position to make their own investment decisions guided by the best available science, an over-arching set of management guidelines or rules, and national priorities that are linked to a sound long-term funding base.

In the further development of national 'regional thinking', the Wentworth Group has identified two opportunities for governments:

1. **Embed more responsibility** for planning and coordinating NRM at the regional scale so that investment decisions are underpinned by an understanding of how landscapes function.
2. Build a **network of technical facilitators** across the continent to work with farmers, indigenous communities and local 'landcare' groups to ensure that everyone's actions contribute to the overall health and productivity of their region.

Environmental accounts. A problem facing any land and water use manager is whether they have access to adequate **information** that is directly relevant to long-term planning and management of places for which they have a responsibility and for which their communities are seeking actions to restore environmental health. This is a vexed question. In some circumstances data needed to deliver information and knowledge is either missing or does not 'fit for purpose'. Some regions may be blessed with data while others are data poor. Furthermore, there are issues in the interpretation of existing data that may impede translation into relevant information. Often there are difficulties in translating the scientific understanding of landscape processes from one area to another. Another concern is that access is made difficult because of agency policies on release and costs of data and information derived from that data. All these difficulties are not insurmountable if there is a national will on collection, storage, access and interpretation of data and information.

As a former chair of the national State of Environment Report (2001), I was struck by the reluctance of some states and agencies of government to release data in order to develop a set of national indicators on environmental change. The Commonwealth had to employ a range of tactics to obtain the information it needed to complete the report. This issue is repeated at the scale of regions. NRM entities are faced with deciding how much time and effort they need to obtain useful information compared with the many tasks they have to perform. The risk facing those regions and other interested parties is that the lack of information may lead by default to poor decisions that result in further land and water degradation.

If we are to integrate the management of our environment into everyday economic decisions that drives a sustainable society, one that generates wealth without degrading its natural capital, then we need a system of environmental accounts. It is not possible to manage the economy without economic accounts. How then can we seriously expect to manage the environment in order to a sustainable productive

economy and maintain national wellbeing, if we do not have accounts that measure the condition of the environment?

The Wentworth Group has been in a position to advocate, and develop and test a new approach to environmental accounts; this work commenced in 2008 with the release of a report entitled *Accounting for Nature*. It was built in part on successful monitoring, reporting and application of measurements in catchments of SE Queensland by the Healthy Waterways Partnership program. Our Group recognised that considerable public funds had been wasted over many decades in Australia, a waste that may have been averted if we knew more about the condition of the lands and waters by way of an accounting process that defined more carefully the needs for investment in different natural regions.

In 2010 a trial was initiated with 10 NRM regions from different parts of Australia to run a 'proof of concept' on the *Accounting for Nature* model. The aim was to test whether regions could assemble information that would measure the condition of environmental assets (native vegetation, rivers, soil etc.) and thus be in a position to track changes in condition through time. A common unit of measure, an *Econd* (environmental condition index), was generated from measurements to enable comparison of condition of different assets at scales at which policy and investment decisions are made. The trial is now complete and currently the results are being evaluated. However, it is already quite clear that despite some difficulties, the trial has been successful and the approach awaits future refinement and application. We believe that we have established a viable and pragmatic building block that embraces all the necessary technical and scientific requirements for a permanent national program that measures the condition of Australia's environmental assets.

The opportunity now exists to create the National Environmental Accounts of Australia involving:

1. The **Commonwealth Government** overseeing a set of account standards for measuring condition of assets at multiple scales.
2. **NRM entities** are given the necessary technical and financial resources to compile environmental accounts for each region.
3. The Commonwealth use this information to produce the annual **National Environmental Accounts** of Australia.

Conclusion. Tim Flannery's suggestion that "there are signs that things are changing for the better" must now be addressed. In my darkest moments, I fear that this is not true; that on balance there are more difficulties, more frustrations, more institutional hurdles and less federal and state resources to meet the vast challenges facing what many see as a fragile continent entering a new climate era. The focus is on short term gains, on generating wealth and jobs now even if that means promoting economic growth at the expense of the environment, or even worse, without full appreciation of the benefits of a healthy environment to achieving economic goals. There is a social license in some places to destroy environmental assets to pollute, to destroy native biota, in short to seek private property gains today at the expense of the public good for both today and tomorrow. In these dark moments, I cannot see a long-term vision

for a sustainable future, one in which my grandchildren will see the benefits of living in harmony with nature.

Yet like the classical economist, on the other hand, I see ‘things’ that give me hope. It is refreshing to read the words of the Minister for the Environment, Greg Hunt, in referring to his father, the late politician Alan Hunt, that he was inspired by Alan’s love of nature:

“Indeed, the long term was his touchstone. He thought in terms of decades and he thought of preserving the great tracts of bush for future generations”.

It is perhaps a pity that Greg operates in a political world where such aspirations are not universally applied. However, I have been heartened by what he has done for the future of Great Barrier Reef and in a particular case, for coastal Australia with continued investment in the National Climate Change Adaptation Research Facility. We can be cynical about Direct Action and other programs, but I think he and other state environment ministers are doing what they can in trying circumstances often to the annoyance of cabinet colleagues.

I am also heartened while at the same time conscious of the dangers inherent in the current federal government’s white papers on Developing Northern Australia and new investments in agriculture. Should I be worried when I hear the Prime Minister speak of “damophobia” as if that those who are cautious about more dam construction are not part of “Team Australia”? Andrew Campbell sensibly raises concerns over planned development possibilities in the north. I can see issues with efforts to continually prop up farmers in marginal lands with drought relief as though we have not learnt from past mistakes. Yet it is necessary for the Commonwealth Government to build on opportunities for improving the nation’s agricultural productivity. But it must do so carefully building on continued investment in science and ensuring that unlike past federal endeavours will not be switched off in later budgets or later electoral cycles as southern Australia becomes aware that it has been throwing money at a multitude of failed projects.

I have been inspired by courageous scientists working with limited resources in many cases on topics that are not ‘politically correct’. I know of climate scientists whose careers have been hurt by their staunch advocacy for emissions control. Climate change research is fundamental to our future and must taken seriously by informing policy to both mitigate and adapt to the forces and impacts of global warming. Extreme events are not going away! They will in all likelihood get more frequent and more intense in populated centres and regional Australia. It is encouraging to hear that the ARC will foster more research in this area. At another level, I am also inspired by individuals such as Judith Wright and John Sinclair, and the many thousands of passionate volunteers, who devote much of their lives to conservation. They have and can make a difference, especially women who are at the forefront of many local ‘care’ projects. Shockingly, situations arise where these dedicated folk are abused by others in their communities who see nature to be exploited not nurtured.

Australia today is more than capable of dealing creatively with environmental issues and meeting environmental goals while still promoting economic growth, not for short-term rewards, but for the medium to long term as global conditions change. We now have enough understanding of our national and regional capacities to minimise mistakes such as we have made in the past; Goyder, Griffith Taylor, Lang and others

paved the way with their studies and advice, surely sufficient lessons have been learnt. Furthermore, as pointed out by the late Peter Cullen, a founding member of the Wentworth Group:

“Our communities are maturing in their understanding of how they impact on the catchment [environment], and the catchment impacts on them. The pressures on our landscape are now escalating, and we face many uncertainties with climate change and energy costs”.

His words highlight the growing awareness for action across levels of government, as well as by the commercial sector that have much to lose if they do not face up to what it takes to make a truly sustainable society.

Way forward. The Wentworth Group has presented a range of opportunities for reform to create healthy environments across the nation’s diverse natural regions that will stimulate a productive national economy in the medium to long term. We reject the current emphasis on short-termism and obsession with indicators that measure day by day economic performance without being cognisant of what all these activities mean for our future. Here is where environmental accounts have a role. But they must be coupled with land use plans and developments that do not lead to adverse cumulative impacts that harm property and productive interests of others. We see the need to reform the tax system to encourage long-term interests and benefits to environmental conditions including elimination of fossil fuel subsidies and use of a broad-based land tax. Institutional arrangements can be rejigged to facilitate improved regional outcomes for both the economy and environment offering greater lifestyle and job opportunities for local communities. And across rural and urban Australia there is further scope to preserve nature, our extraordinary heritage that is so fundamental to Aboriginal culture and now should be for all Australians. All this means the need to take action so that a healthy environment becomes a natural by-product of our economy—a partner to economic growth, rather than a competitor.

Bruce Thom

(This essay was written in 2016)