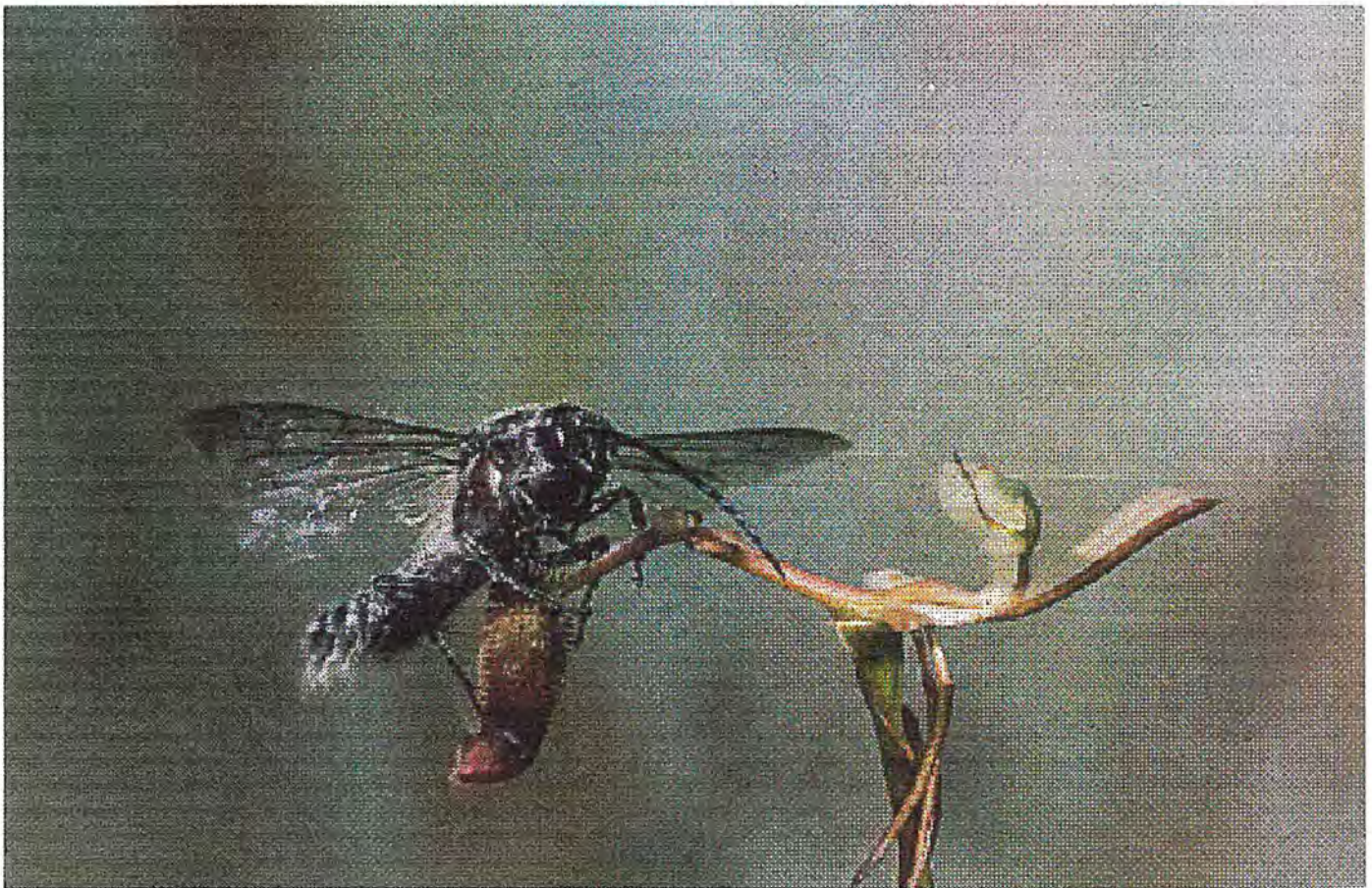

Sustaining Western Australia's Natural Advantage

- Exploiting the Synergies.

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SUSTAINING WESTERN AUSTRALIA'S NATURAL ADVANTAGE - EXPLOITING THE SYNERGIES

Sail the Nullarbor

*Now I could spend my holidays on videos galore
or lie on the beach getting sorry and sore
or I could sail the ocean see another foreign shore
Well I took my little Kelpie and I sailed the Nullarbor*

*And I saw the colour changes from Albany to Broome
a pair of white corellas singing out of tune
wildflowers in bloom
And I saw the rusty Hamersleys from a dusty Wittenoom*

*And I saw the giant karris, oh
you couldn't paint the view
amazing what a cross-cut could do
I would have liked to be there before wouldn't you?*

*And I learnt about the whales and cried
bloody thousands died
but they are swimming back to sea
I bet you never heard a more beautiful thing*

*And through the Swan Valley there's banksias
and warriors making a stand
Yeah look out for blackboys
They're guardians protecting this dear old land*

*Spinifex and snappy gums
hazy green blue grey
you gotta go that way
There's nearly half Australia over there in WA*

*Yeah I saw the colour changes from Albany to Broome
A pair of white corellas singing out of tune
wildflowers in bloom
And I saw the rusty Hamersleys from a dusty Wittenoom*

*Now you could spend your holidays on videos
or lie on the beach getting sore
or you could sail the ocean
Why don't you take your best mate
and sail the Nullarbor Hey!*

John Williamson

Introduction

There are few Western Australians today who would not agree with John Williamson that this State has a unique and beautiful environment which should be protected. Almost daily the media reports the formation of local action groups to protest about the destruction of a piece of 'their' unique local bushland. It is easy to forget that our appreciation of the natural assets of this State have been belated. This is what one of the early country and western balladeers sang about Western Australia -

Ode to Westralia

*Land of forest, fleas and flies,
blighted hopes and blighted eyes,
Art thou hell in earth's disguise,
Westralia?*

[A Bush Song, Anon]

Even the great naturalist and scientist Charles Darwin wasn't impressed -

"...We did not during our voyage pass a more dull and uninteresting time... Everywhere we found the soil sandy, and very poor... The general bright green colour of the brushwood and other plants, viewed from a distance, seemed to promise fertility. A single walk, however, was enough to dispel such an illusion; and he who thinks with me will never wish to walk again in so uninviting a country".

Charles Darwin 1836
[Albany]

During the post war housing boom huge swathes of urban Perth were cleared of every vestige of native vegetation for housing estates without a murmur from the community. It is not long ago that farmers were penalised if they did not fulfil their obligations to clear the bush from the land that they had been conditionally allotted. The desire to conquer 'the bush' was understandable. It would be hypocritical if, with the clear vision of hindsight, we were to condemn the efforts of the pioneers who settled and developed this State. It is their success which has provided the foundations for the lifestyle that we enjoy today. Without their achievements, we would not have either the disposable income or time to enjoy the natural wonders of Western Australia.

But we have entered a new age. It has been described as an age of discontinuity. But a welcome feature of this new age is, and what I believe will be, a constant appreciation of concern for our natural environment. But how can we reconcile our care and concern for the environment with a desire to retain the economic benefits which were passed on to us by our predecessors? I hope, tonight, to illustrate, not just the spectacular beauty of the natural assets of this State, but also the beauty of the synergies that abound in it and use this forum to explore the possibility that in those synergies there may be the clue to that reconciliation.

Why does Western Australia have a natural advantage?

There is probably no person on earth who would not claim that their home is unique and more beautiful than anywhere else on earth. Consequently, the case for Western Australia's bizarre beauty, particularly where it is put by a Western Australian, may be arguable. But there is no question that in the natural wonder stakes Western Australia is a winner. That is a consequence of a combination of factors which do not occur anywhere else on this earth.

All islands have a mystique. In part, that mystique has a scientific basis because an island inevitably evolves a unique gene pool. But temperate Western Australia is an island in an island continent. The genes of our plants and animals have been effectively isolated from the rest of Australia and the rest of the world for millions of years. That is one of the reasons why we have a plant flora as diverse as any place on earth and it is why so many of our plants and animals grow and live only in Western Australia. There are over 12,000 different flowering plants in Western Australia. One of our national parks has more plant species than occurs in the whole of the United Kingdom.

Western Australia is an ancient island. This is one of the oldest places on earth. Many of our landscapes have been subjected to more than 2 billion years of weathering and erosion. The stromatolites that occur at Shark Bay and Lake Clifton are the world's oldest living fossils. Our soils have been heated, cooled, drenched, desiccated and leached of nutrients for billions of years. It is no accident that it was Western Australian scientists working on Western Australian soils who first revealed to the world the importance of trace elements to plant and animal nutrition.

Superimposed on this ancient landscape is a climate characterised throughout much of Western Australia by extremes in rainfall regimes. The plants and animals of Western Australia have had to adapt to long periods of drought, and since it 'never rains but it pours' they have to be opportunistic water users.

There are few ecosystems in the world that do not have to cope with fire occasionally - even the tropical rainforest will burn. But the Western Australian environment is naturally fire prone and there are few ecosystems in the world that experience the fire frequency and intensity that occurs naturally in Western Australia.

How do our plants and animals survive?

It's not surprising, given the isolation of Western Australia and its bizarre and often harsh environment, that Western Australian ecosystems are bizarre and the plants and animals that have evolved to live in this place have developed remarkable techniques for survival.

South Western Australia has the highest proportion of poison plants in Australia. For example, there are 40 species belonging to the genus *Gastrolobium* (the 'poison pea') in Western Australia, whereas no species of this genus occur in eastern Australia and there are only two species in tropical Australia. The toxic component in poison peas is fluoro-acetate. This chemical acts by blocking the Krebs Cycle, inhibiting cellular respiration. If the foliage or seed of this plant is eaten by vertebrates, the central nervous system and heart is impaired and the animal dies. (There is an understandable concern in the community about the impact of man-made chemicals on human health, but I am not sure whether some of the advocates of natural approaches to pest control appreciate that some of the most deadly chemicals occur naturally in our native vegetation). Farmers, including my grandfather, who was one of those who carved a farm out of the bush at the turn of the century, learned from bitter experience that a break in the farm fence which allowed the sheep or cows to graze the local bush could have catastrophic consequences. Fortunately, the micro organisms in Western Australian soils can detoxify this chemical, otherwise it would accumulate in our soils and make south Western Australia a very hazardous place. The development of anti feedant mechanisms in plants is, of course not peculiar to Western Australia, but there is increasing evidence that our plants have an abundance of them.

It wasn't long after I commenced my first job as a forest research officer that I learned that it is 'the little things that count' in Western Australia's ecosystems. After the Dwellingup wildfire of 1961 tens of thousands of hectares of the forest regenerated densely with legume species. I was particularly interested in determining if this phenomenon could be repeated under controlled conditions. At the time I believed, as I still do, that a leguminous understorey could contribute to the reduction of the impact of dieback (caused by the soil

borne fungus *Phytophthora cinnamomi*) on the jarrah forest. I spent many uncomfortable months crawling under these dense legume stands (the legumes have vicious prickles) searching for seed to no avail. We also carried out experimental fires in an attempt to duplicate what had happened during the wildfire. Our searches and fires produced miserably few seeds or plants, yet we observed and collected kilograms of seed from the pods formed from the flowers before they dropped to the forest floor. We finally managed to simulate the legume regeneration phenomenon when one experimental fire reached intensities much higher than planned. Following that fire we noticed that the regenerating legumes occurred in clumps. But we knew that legume seed dropped randomly from the plants. When we dissected the legume clumps we found that the plants were growing from several centimetres below the soil surface. We looked around for something that was moving the seed ; and there they were - ants. Ants have an abnormal obsession for the appendage of legume seed and they have a prodigious capacity to collect and store it, sometimes at more than 10 centimetres below the soil surface.

Fires, and occasionally high intensity fires, are a natural feature of our environment, and one of the consequences of fires is that nitrogen is volatilised. Our ecosystems would deteriorate if there wasn't a mechanism to return nitrogen back to the soil. That mechanism is partially provided by legume species which extract nitrogen from the air with the help of micro-organisms that lives in the nodules which occur on legume roots. Legumes are killed by fire and so would their seed if it lay on the surface of the soil. But the seed won't germinate unless it is heated. Having a store of legume seed at different depths in the soil ensure that when severe wildfire occurs there will always be a capacity to replace the legume understorey from the seed stores. The hotter the fire the greater the loss of nitrogen, the greater the density of legume regeneration.

Western Australian plants would not survive if they had not formed partnerships with fungi and other micro organisms which enable them to grow in our very infertile soils. So-called mycorrhizal fungi live in plant roots from which they obtain food. In return, they extend the plant's root system and suck from the soil plant nutrients, partially phosphorus. Early foresters learnt, to their cost, that if they didn't inoculate pine seedlings with mycorrhizal fungi their plantations were doomed to failure.

But often the synergisms that occur in our natural ecosystems are complex and involve many partners. For example, the Woylie is a small marsupial which lives in the jarrah forest. Hypogean fungi form a substantial part of its diet, but spores from the fungus survive the passage through the animal's intestine. These same fungi form mycorrhizal associations with plants, including eucalypt roots. The Woylie prefers a habitat of poison pea thickets because they provide shelter. These plants also have a micro organism associate in their roots which extracts nitrogen from the atmosphere. Poison pea thickets are destroyed by fire. But in addition to eating the fungi, Woylies also distribute and bury the seed from the poison plants. Thus when the inevitable occurs and fire kills the poison pea thickets, the seed is protected because it is buried and dispersed by the Woylie. The Woylies benefit the fungi because they disperse the fungal spores. The fungus provides a rich source of nitrogen and phosphorus and lipids to the Woylie. The poison pea's reward from the partnership is that their survival is ensured because the Woylie protects them from extinction by fire.

Some of the adaptations that have evolved in Western Australia can only be described as lascivious. More than a hundred species of orchids occur in south Western Australia. Most flowering plants obtain the services of pollinators by offering nectar and or pollen, but many

species of our orchids offer a different type of reward - sexual gratification. The slender hammer orchid emits a pheromone (or scent) similar to that which is emitted from a female Thynnine Wasp. The labellum of the flower is very similar to the wingless female of the species. The male wasp is attracted to what it thinks is a female and attempts to perform the ancient rite of reproduction. The male wasp is not monogamous and when it repeats this exercise on another orchid, it carries with it pollen. Clearly, the flower benefits from this synergy because it achieves cross fertilisation. There are no studies that have been carried out to determine if the male wasp has a positive or negative reaction to what clearly is a fraud.

Western Australia's natural ecosystems abound with remarkable adaptations in our plants and animals, and with them unusual physical and chemical processes. We have hardly scratched the surface. What we have revealed explains why our ecosystems are resilient even though they are often subject to violent perturbations. There is much we do not know, but there are two features of Western Australia's ecosystems which stand out. They are dynamic (you can't freeze-frame nature) and self interest (survival) is accommodated by synergy.

The Great Conundrum - how do we fit into this environment?

Having discovered the wonders of Western Australia, the problem is to find out how we fit into it.

Different interest groups have proposed various strategies to resolve this conundrum. One of the more extreme has been the proposal that we subjugate humans to nature completely - even export them from this continent. There are obvious disadvantages to this approach for those of us who want to enjoy Western Australia's natural environment. But this strategy is also fundamentally flawed. If we were to detonate a neutron bomb that only killed the human species in Western Australia, it is unlikely that many of the State's environmental problems would be resolved and there is some evidence to suggest that many would become worse.

A less radical, but no less daunting, strategy, is to accept *Homo sapiens* in Western Australia provided that they were prepared to forgo the material benefits of their 'civilised society' and live as the indigenous people did before Europeans settled this State. There is no doubt that the indigenous people were much less damaging to our natural environment than European man and we are learning much from Aboriginal land management practices. Nonetheless, there are some scientists who would argue that the impact of Aboriginal practices on natural ecosystems in Western Australia was not entirely benign. In any case, notwithstanding the importance of the environment in the political polls, there is overwhelming evidence that indigenous and non-indigenous people in this State are quite focused on improving their living standards and, in particular, the employment prospects of their children. Those who do propose a dramatic reduction in economic growth as a panacea for our environmental problems also have to explain why there is a high correlation between environmental degradation and poverty.

Our conundrum is the world's conundrum and the World Commission on the Environment was asked to find the answer. In its report - 'The Brundtland Report' - it concluded that the solution was Ecologically Sustainable Development. The principles of ecologically sustainable development are logical and simple.

PRINCIPLES OF ECOLOGICALLY SUSTAINABLE DEVELOPMENT	
INTEGRATING ECONOMIC AND ENVIRONMENTAL GOALS IN POLICIES AND ACTIVITIES	
◆	Ensuring that environmental assets are appropriately valued.
◆	Providing for equity within and between generations.
◆	Dealing cautiously with risk and irreversibility.
◆	Recognising the global dimension.

Considering the complexity of the task and the sensitivity of the issues the Commission faced, the response to its findings has been overwhelmingly positive. Few would disagree that we must integrate economic and environmental objectives. The philosophy of the Brundtland Report still remains high on the agenda of most nations. But increasingly, those who have the responsibility of converting the principles into action are discovering that part of the appeal of the concept of 'ecologically sustainable development' is that it can mean all things to all people. The term has connotations of science and therefore it has been assumed that it can be interpreted objectively. But the philosophy of ecologically sustainable development encompasses a spectrum of concepts and what it means to you depends on which constituency you belong to.

For example, the practice of ecologically sustainable development requires that we embrace the 'precautionary principle'. That is, we should not undertake any activity that may result in any irreversible destruction of an ecological process or a plant or animal species. The difficulty in the application of this principle is that the assessment of risk to a natural ecosystem, because of the complexities of the interactions (some of which I have described) and the time it may take for a positive or negative effect to emerge must involve a value judgement.

The dilemma that managers face is illustrated by the difficulty of responding to scientific studies on the impact of the greenhouse effect. Those who are researching the greenhouse effect quite correctly report the results of their research, with appropriate caveats, as they develop their knowledge. In 1988 it was reported widely in our newspapers that there was likely to be a 20 per cent reduction in rainfall in the south-west of Western Australia by the year 2030. One of the logical responses to this scenario would have been to constrain tree planting and in fact deliberately reduce the densities of trees by thinning so that forests could accommodate the drier conditions. But in 1993 the scenario is quite different. The recent evidence from greenhouse research suggests that rainfall may increase, or decrease, by 20 per cent some time in the future. If we bet on a reduction in rainfall and cease planting trees and reduce native forest density by thinning, and we are right, our successors will undoubtedly acknowledge our foresight which would have prevented potentially catastrophic death of native vegetation and trees throughout the south-west of the State. But if we were wrong and the rainfall increased resulting in rising water tables and massive salination throughout the south-west, I have no doubt there would be considerable retrospective retribution.

Since our natural environment is 'a common' in that it is owned by the whole community, it is the community's right, through the political process, to have its values reflected in any decision about the natural environment. But it is not surprising, since our appreciation of the

natural environment is relatively recent, that our political process is having some difficulty in delivering a rational consensus on environmental issues. The current environmental debate is a mixture of good and bad science and genuine and ideologically driven value judgements; altruism and self interest. Community understanding of environmental issues is not helped by commentators on environmental issues who, almost daily, ask 'what is the truth' about an environmental issue but, like Pontius Pilate, 'never stay to hear the answer'. At the end of the day truth will win out. But it is the nature of 'nature' that the truth about ecosystems and the best way to manage them may take a long time to reveal, and what is true today may not be the whole truth.

Natural ecosystems are dynamic and we have to manage them. We do not have the luxury of waiting until we have perfect understanding and unanimous community endorsement. Notwithstanding our imperfect knowledge and land management skills, there are numerous opportunities for us to fit into our natural environment. We can accommodate our self interest in a way which will also ensure the repair and protection of our natural environment provided that the political debate over the environment develops some maturity.

Integrated management - the prerequisite to the exploitation of synergies

Conquering the rising water tables

One of the consequences of a way the debate on the environment has been conducted is that our energies have been deflected to less pressing issues and the real problems have not received the necessary attention. One, if not the major, environmental problem confronting Western Australia is land and stream salinity. The problem has arisen as a consequence of clearing native vegetation to establish our agricultural industries. It is probable that even if we had known the consequences of clearing native vegetation, the land would still have been cleared for agriculture, because without our agricultural industries Western Australia would not have survived.

But salination is a major problem. Between 400,000 and 900,000 hectares of Western Australia's agricultural soils have been degraded by salination. Over 50 per cent of our freshwater streams are saline. It is estimated that up to 2.5 million hectares of agricultural land could be lost to salination even if there was no further clearing.

The impact of salination on soils and water has generally been recognised in the community and particularly our farmers who initiated the landcare program which has been taken up by the rest of Australia. What has not received much attention is the impact of salination on our conservation reserves and our wildlife. Already significant freshwater wetlands have been lost. The residual woodlands which have been reserved for conservation by farmers and as part of the public conservation estate are also threatened because these reserves frequently occur in the valley systems. These woodlands are some of the most important habitats for Western Australian native animals and the birds.

Unlike other environmental problems, we are certain as to the cause and we know how to remedy it. Salination results from rising water tables which contain huge stores of salt. The water tables are rising because perennial native vegetation has been replaced with annual crops that use less water. The solution is relatively simple. All we need to do is to pump up the surplus water and dispose of it.

Closing down our farms and letting nature take over would not help because native vegetation will not naturally recolonise farmland. We could re-establish the original vegetation on farmland but apart from the loss of agricultural income, it could cost in excess of \$1.5 billion to re-establish native vegetation and \$100 million per year to maintain it.

There is an alternative. Establishment of commercial tree crops on farms in such a way that they are integrated into the total farm can reverse salination, enhance agriculture production, provide a new cash crop for farmers and a new export industry for the State.

The integration of tree crops into farms is a perfect example of the exploitation of synergies. The trees being established benefit from the cause of the environmental problem, that is the extra water that is in the ecosystem. Trees modify the environment in a way that benefits both crops and stock. This project is not a dream, it is happening. This year more than 23 million trees were established on farms and by the turn of the century it is possible that there will have been 200 million trees established. If this objective is achieved, and I am confident it will be, there will be a major reduction in salination achieved at no cost to the farmer or the State, and a new industry earning \$500 million of export earnings will have been created.

Outfoxing the fox

Another consequence of the way that the environmental debate has been conducted is that frequently the cause is attributed incorrectly. Australia, and particularly Western Australia's, record for conservation of native animals is extremely poor. Eleven of the 141 species of native mammals present in Western Australia are extinct. Ten years ago the State's faunal emblem, the Numbat, was perilously close to extinction. There are a variety of factors which have contributed to the parlous state of our native mammal fauna. But the overwhelming reason for the decline of native mammal populations is feral mammal populations, particularly the European fox.

Over the past 10 years CALM scientists and managers have demonstrated conclusively that if foxes are removed from native forest ecosystems by the application of poison baits, there is a dramatic increase in native animal populations. For example, in the past 10 years the populations of Numbats has been quadrupled in areas which is subject to fox control. Similar results have been achieved with the native cat the Chuditch, the Woylie, Tammar Wallaby, Brush-Tailed Possum and Rock-Wallaby. This is a conservation coup of international significance - we are successfully bringing back animals from the brink of extinction.

It has been made possible by the fact that the baits used to control foxes contain an analogue of a naturally occurring poison in native plant species - fluoro-acetate - the chemical that was so effective in killing my grandfather's stock. Native animals are tolerant of fluoro-acetic acid because they have evolved an environment where it is a naturally occurring substance; the foxes have not.

Plant Vaccination

One of the other most significant 'ferals' causing immense environmental damage in Western Australia is the water mould fungus *Phytophthora cinnamomi*. This introduced plant pathogen (the cause of dieback) has caused extensive damage to plants in ecosystems throughout the south-west of Western Australia. It has reached the zenith of its impact on the

south-coast of the State which is also one of the areas of maximum plant diversity. Unfortunately, many of Western Australia's plant species, possibly because they have evolved special structures to cope with infertility, are highly susceptible to this introduced fungus. In the south-coast, environmental conditions are so suitable for this fungus that some native mammals can carry *Phytophthora* infested soil and are thus vectors of the disease.

But there is even some hope that we may be on the way to some amelioration of this intractable problem. CALM scientists have shown that we can confer resistance on even the most susceptible plant species by inoculating them with the simple compound 'phosphonate'. Plant pathologists do have the advantage over those in the medical profession in that we don't have the same protocols for testing vaccines on the target subjects. On the other hand, we do suffer from the problem that it is unlikely the State will sponsor a ubiquitous vaccination program for Western Australian native plants. But the hope is that we will be able to discover why 'phosphonate' triggers this incredible resistance mechanism and devise simple and practical techniques which will allow its broadscale application.

Generating wealth from natural attractions

While there is generally community support for the idea of spending money on the conservation of plants and animals just for the sake of saving them, the reality is that they are equally resistant to the idea of paying more taxes. We need to create more wealth if we are going to sponsor conservation for the sake of conservation. There is one industry which can do both.

Tourism rivals primary industries as an export earner. Worldwide, tourism's annual growth is 3.7 per cent. But nature based tourism is increasing at a rate of more than 25 per cent. Western Australia is uniquely placed to capitalise on this sector of the tourist market. Tourists can go to high class hotels and casinos anywhere in the world. What makes Western Australia unique is its natural environment. It is possible with appropriate management to integrate the economic benefits of tourism with conservation of our natural assets provided that a proportion of the revenue is directed to nature conservation.

The whale shark tourist phenomenon is a classic example of the power of unique natural phenomenon to attract tourists. The whale sharks visit the Ningaloo reef off Exmouth each year to gorge themselves on the plankton which is in abundance when the coral reef spawns. This is the only place in the world where whale sharks can be readily viewed by tourists. This year 1,000 charter boat passengers, paid between \$350 to \$1,000 each, to enjoy the experience.

A major nature-based tourism attraction in Western Australia is the Monkey Mia dolphins. One hundred thousand people visit Shark Bay each year, primarily because of the dolphins. These visitors generate more than \$10 million for the region, even though on average a visitor stays less than two days. At a cost of \$30,000 per year it would be possible to eradicate the European fox from the Peron Peninsula on which Monkey Mia is located. If this was achieved it would be possible to reintroduce back to the mainland Banded Hare-wallaby, Shark Bay Mouse, Boodie and Western Brown Bandicoot which currently survive only on the islands nearby. If the existence of these animals adjacent to Monkey Mia persuaded the average tourist to stay one more day, an additional \$5 million per annum in tourist dollars would be generated.

Nature-based tourism also provides exciting opportunities for Aboriginal communities to develop their own enterprises. For example, this year CALM, in partnership with the Bunuba Community centred on Fitzroy Crossing, launched a special boat tour in the Geike Gorge which features Aboriginal culture. The integration of Aboriginal culture with the beauty and wonders of our natural environment results in a 'tourist product' which is second to none in the world.

Farming pharmaceuticals

Aboriginal people have used medicines derived from 'the bush' probably since not long after they arrived in Western Australia more than 40,000 years ago. Scientists have long suspected that Western Australian plants could yield unique chemical components with useful pharmaceutical properties. A few, like Professor Jack Cannon working from the Chemistry Department of the University of Western Australia, have researched the chemistry of Western Australian plants and endeavoured to stimulate further research into their potential for pharmaceuticals.

Recently 'biological prospecting' of our native plants has received a major stimulus. Scientists from the National Cancer Institute of the USA have identified and patented (in February of this year) a chemical compound which, in *in vitro* trials, has demonstrated the capacity to destroy the HIV virus at exceptionally low concentrations.

A consortium of more than thirty Western Australian scientists - chemists, ecologists, horticulturists, medical research workers, botanists, remote sensing specialists - from CALM, Western Australian universities, the Government Chemical Laboratories, the Royal Perth Hospital and AMRAD, an Australian Pharmaceutical Company, are working with the National Cancer Institute to progress the development of this compound through toxicological and chemical trials.

It is possible that this compound may not lead to a cure for AIDS. But even if it doesn't, the infrastructure is now in place for a systematic evaluation of the pharmaceutical potential of the Western Australian biota. We would be extremely unlucky if we were not to extract more elixirs from the cocktail of chemicals that has evolved in our natural ecosystems over aeons in response to the pressures of a bizarre and harsh environment. It would only require us to chance a few to enable us, with the appropriate political will, to establish a new multibillion dollar industry based on our natural assets, and which would therefore guarantee their protection.

Conclusions

It is ironic that the characteristics of the Western Australian environment that made this land so inhospitable to the first European settlers - its isolation, infertile soils, harsh climate and bizarre plants and animals - are the very same characteristics which provide us with the opportunity to create new sustainable wealth creating industries which can repair our economy and the environment.

I have no doubt that in this generation we have the scientists, managers, workers and farmers who have the skills to capitalise on the natural comparative advantages that this State provides - there is no evidence that the quality of our genes have deteriorated. Our forebears

were able to successfully create a social and economic environment second to none in the world by the development of a culture based on rugged individualism. There is a real danger, however, that the unbridled application of that culture, which was appropriate and successful during the pioneering phase of this State's development, will prevent us developing a new growing sustainable economy which is in harmony with our environment

Our national propensity to be gladiators will undoubtedly continue to contribute to our success in the international sporting arena. But when this penchant is combined with a communications system which has made the globe a village, a volatile cocktail is created. The transmission of misinformation, whether unintentional or deliberately designed to create conflict and fear, in today's society is instantaneous and ubiquitous. This modern phenomenon, probably more than any other factor, inhibits our progress towards achieving sustainable development.

If there is one thing we can learn from Western Australian ecosystems is that loners don't survive in a harsh environment. There is not one Western Australian plant or animal that has not formed beneficial partnerships. But we have become a nation and a state of compartments. Our political structures, our government departments, our community groups, and even our scientific disciplines, are so rigidly structured that it is easy to conclude that the territorial imperative in *Homo sapien var australis* is more intensely refined than in any other species. We have no chance of even understanding our ecosystems let alone managing and protecting them unless we breach the fences which surround the compartments.

Western Australia is a treasure trove of natural places, plants and animals, and natural produces. The key to the treasure and its preservation is to integrate our science, our management and our goals. Integration is the only way we will be able to exploit the synergies in our environment and in our society. Synergy means 'working together', but it does not mean that we have to subjugate our admirable national trait to question with vigour. It will require, however, that we don't make Pilate's mistake. When we ask what is the truth about our natural environment and how we manage it we must stay to hear the answer.