

Parks and parks agencies in a rapidly changing world

Andrew Campbell

Parks Victoria
Melbourne 15 December 2008

www.triplehelix.com.au

Outline

- Drivers of Change
- Implications for parks and park managers
- Characteristics of a [high performing]
2020 parks agency
- Thoughts on Healthy Parks Healthy People
- Flying some kites



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Take home messages

- We are entering a period of unprecedented environmental change, that is likely to intensify
 - **this is not a blip**
- Business as usual is not a viable trajectory, but we have choices...
- Increasing pressures on landscapes will squeeze nature
- Parks and park agencies have a critical role
- Healthy Parks Healthy People is on the right track
- Making it real means forging new relationships and ways of working, and cultural change within
- Leadership is needed at all levels



3

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4

The human footprint on the planet

	1950	2050
Population	2 billion	9 billion
CO ₂	310 ppm	>450ppm
Energy Use	80EJ/yr	>550EJ/yr
Sea Levels	—————	0.2-1.5m higher

- This trajectory cannot be sustained without a radical decoupling of economic growth from resource depletion and degradation, and from emissions of greenhouse gases (GHG).
- Achieving such a decoupling is the most profound structural change the world has ever attempted



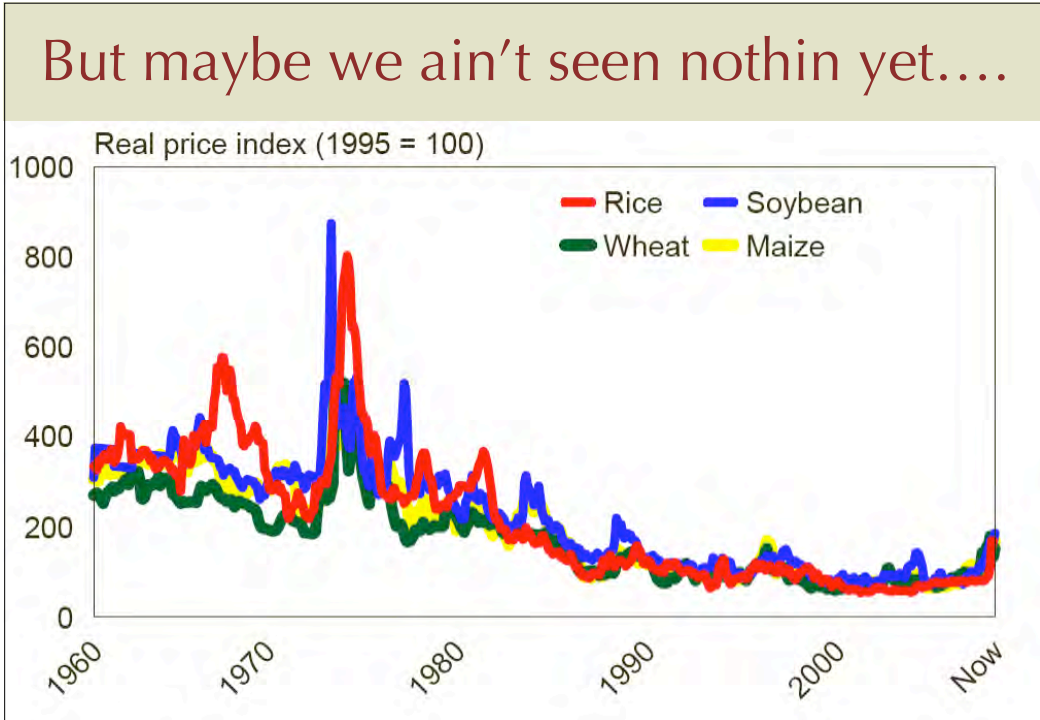
5

Feeding the world

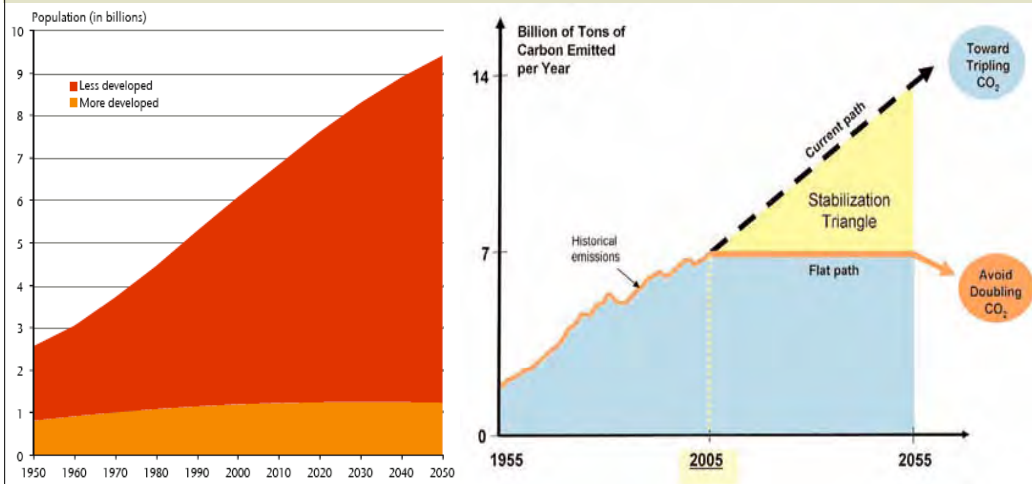
- In essence, the world needs to double food production by about 2050, & improve distribution
- We have done this in the past, mainly through clearing, cultivating and irrigating more land
 - and to a lesser extent better varieties, more fertiliser etc
- Climate change is narrowing those options, with limits to:
 - water
 - land
 - energy
 - nutrients



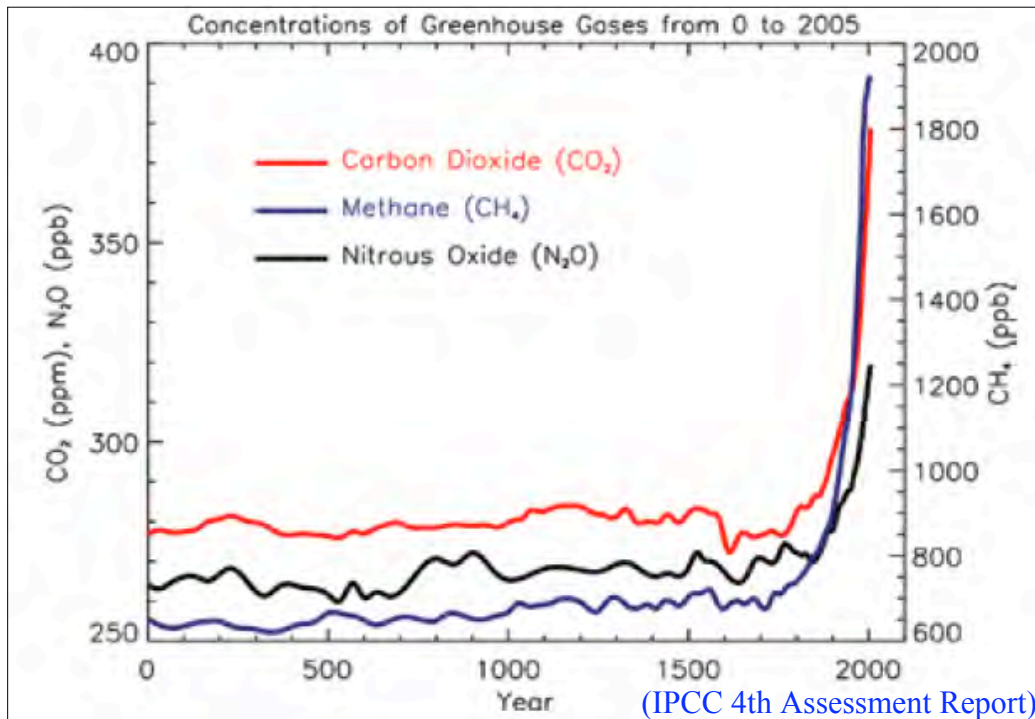
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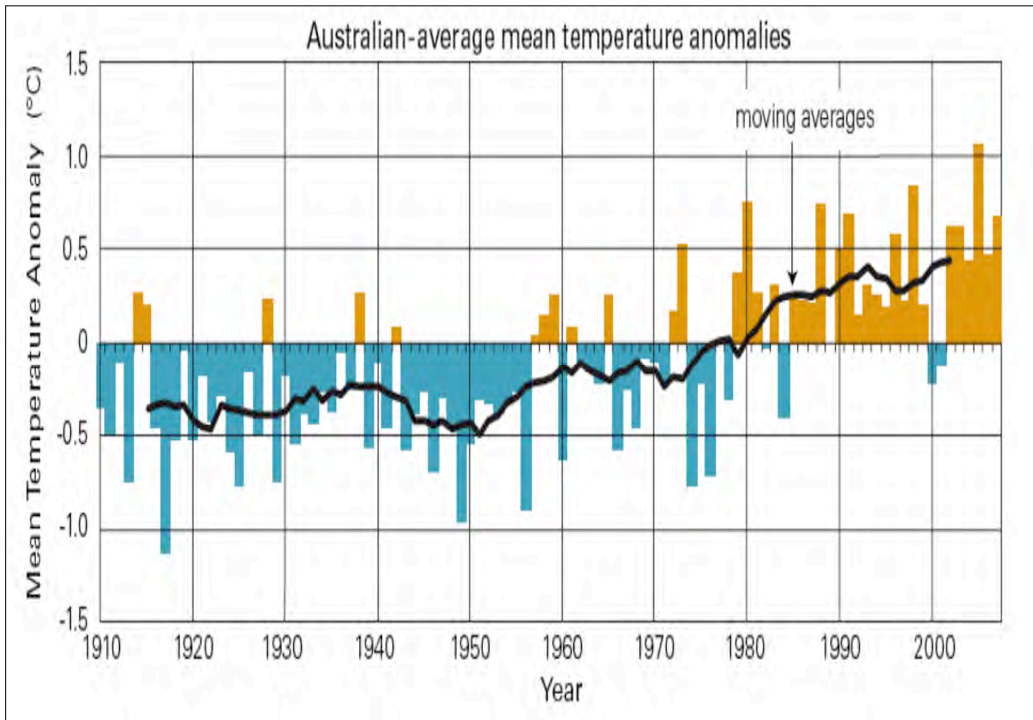


Population & carbon emissions



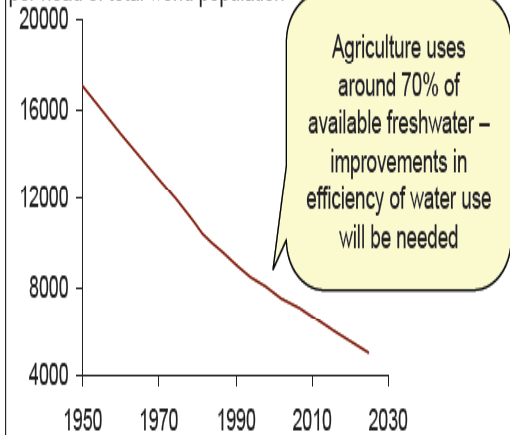
Source: WBCSD & IUCN 2008; Harvard Medical School 2008





Water

Actual and projected freshwater availability, cubic metres per head of total world population¹

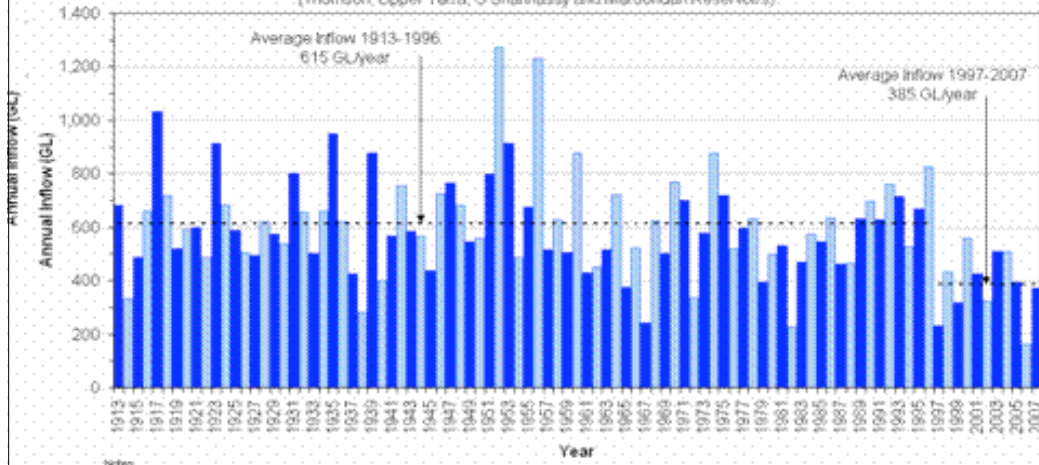


- Each calorie takes one litre of water to produce, on average
- Like the Murray Darling Basin, all the world's major food producing basins are effectively 'closed' or already over-allocated

Melbourne's Annual Storage Inflow GL (1913-2007)

Total annual water flowing into Melbourne's main water supply storage reservoirs

Total annual water flowing into Melbourne's main water supply storage reservoirs
(Thomson, Upper Yarra, O'Shannassy and Maroondah Reservoirs)



In Victoria, last 7 years the driest 7 years since records have been kept. Inflows to Melbourne storages since 1997 35% lower than prior to 1997.



Energy & nutrients

- The era of abundant, cheap fossil fuels is over
- Rising energy costs = rising fertiliser costs



Remaining reserves (billions of barrels) of crude oil (EWG 2007)

EWG 2007
Image: NASA Visible Earth (<http://visibleearth.nasa.gov>)

Potential shocks & discontinuities

- The Greenland Ice Sheet is melting much faster than the IPCC worst case scenario. Sea levels could rise metres this century, not just 20cm.
- The Himalayan glaciers feed rivers that water India, Pakistan & Bangladesh (among others). They are disappearing much faster than worst case scenarios. Huge potential for conflict and massive refugee flows, war or not.
- The gulf stream 'conveyor belt' that warms western Europe could flip, tipping it into a mini Ice Age.
- The disappearance of the Arctic Sea Ice in summer (for the first time in at least 14 million years) will lead to a rapid acceleration in warming through the albedo effect, potentially accelerating tipping points.
- Trade barriers & farm subsidies go up. Countries hoard oil.
- There will be wars over land and water.



15

The response menu

- The nature of the human economy
- Human behaviour & social organisation
- Systemic reform:
 - Energy
 - Transport
 - Urban design & planning
 - The built environment
 - Farming Systems
- Making better use of knowledge



16



Decarbonising the human economy

- The biggest structural reform ever attempted
- Requiring unprecedented international cooperation
- The current melt-down in world financial systems is a great opportunity
 - Governments can find trillions to bail out banks
 - Unusual levels of intervention (inc nationalisation) the new norm
 - This is exactly the time to be implementing structural economic reform to decouple economic growth from carbon emissions
 - From a climate change perspective, this may be the recession/depression we had to have

Human behaviour & social organisation

- Values
- Lifestyle
 - Diet, food production systems
 - Energy use
 - Travel, holidays
- Social structure
 - Localism vs globalism
 - Resilience & connectedness (drought, fire, flood mentality)



19

Unprecedented systemic reform

PRINCIPLES: Avoid or reduce consumption; reuse or recycle; switch to renewable sources; close loops (eliminate waste)

- **Energy**
- **Transport**
 - Beyond oil; 2nd Gen biofuels, Rail, CNG, hybrids, fuel cells, plug-ins
- **Water**
 - Reconfiguring irrigation, stormwater re-use & sewer mining in urban areas, household-level water trading, radical lifts in water productivity, both irrigation and rain-fed



20

Decoupling economic growth from carbon emissions

Energy Options (15 energy 'wedges', each able to ↓ emissions x 1 billion t)

Efficiency



1. Double fuel economy for 2 billion cars to 60mpg (4.5l/100km)
2. Halve distance traveled for 2 billion cars: urban design, mass transit, telecommuting
3. 25% cut in emissions from buildings & appliances
4. Double coal-power output with advanced high temperature materials

Fuel Shift

5. Replace 1400GW of coal-fired power with natural gas plants (ave plant = 1 GW)



CO₂ Capture & Storage (CCS)



6. CCS for 800GW worth of coal or 1600GW of natural gas (ave plant = 1 GW)
7. Capture CO₂ at plants producing H₂ from coal or natural gas
8. CCS at synfuels plants producing 30 million barrels of oil a day from coal

Nuclear Fission

9. add 700GW (twice the current capacity)



Renewable electricity & fuels



10. Add 2 million 1MW-peak windmills (50 times current capacity)
11. Wind-derived H₂ for fuel cells in hybrid cars: add 4 million 1MW peak windmills to make H₂ (100 times current capacity)
12. Add 2000 GW-peak photovoltaics (PV) (700 times current capacity)
13. Add 100 times current ethanol production: one-sixth of world's cropland

Forests and agricultural soils

14. Eliminate deforestation. Plant 300Mha of new trees (twice current rate)
15. Conservation tillage for all cropland (10 times current rate)



Source: Pacala & Socolow, *Science* 2004; 305:968-971

The built environment

- Cities
 - For the first time in human history, more people now live in cities
 - Cities have a huge ecological footprint
 - Urban design — transport, services, infrastructure — is critical
 - Potentially efficient: sinks for energy, water & nutrients
 - Scope for steep increases in urban food production & rapid innovation
 - Food & Water Sensitive Urban Design an urgent priority
- Households
 - Food production & consumption is the biggest part of the household footprint
 - Much can be done to lift energy & water efficiency (existing know-how)
- Waste
 - Where it can't be avoided or reduced, look to reuse it for nutrients, water and energy
- Coasts (low-lying) need a complete re-think



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We need a third agricultural revolution — what might it look like?

- Closed loop farming systems (that don't leak)
- Smart metering, sensing, telemetry, robotics, guidance
- Cross-fertilisation between low input systems and high-input, high-output systems
- Better understanding & use of soil microbial activity
- Urban food production, recycling waste streams, water and nutrients
- Detailed product specification (e.g. Tesco)
 - more returns to farmers?
- 'Carbon plus' offsets and incentives
- Landscape reconfiguration to deliver resilience, water, bioenergy, biodiversity, beauty, heritage



23

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24

Climate Change and Parks

- Climate change drives wicked threats to biodiversity
 - Changing the availability and use of water
 - Increasing risks from invasive animals and weeds
 - Stimulating changes in land use & behaviour
 - Altering fire regimes
- Climate change raises the stakes & increases the risks
- But it does not fundamentally change the game
- Best practice is still best practice
(in the main)



25

Other implications

- Threats and pressures on biodiversity
- Community demands
- Contest for natural resources
 - water, soil, energy
- Manage across whole landscapes
- Work with other land uses and land users
- Knowledge frameworks that can support adaptive management



26

We also need an environmental revolution — what might it look like?

- Radical improvements in environmental literacy
 - Learning to ‘live like an Australian’
- Management of whole landscapes for multiple outcomes
- Decentralisation of energy, water and food systems
- (Re)uniting environment, health and food
- Urban food production (and open space ‘natural’ experiences), recycling waste streams, water and nutrients
- Landscape reconfiguration to deliver resilience, water, bioenergy, biodiversity, beauty, heritage
- ‘Carbon plus’ offsets and incentives



27

Land Use Planning & Design

- Victoria is “post-agricultural” in several regions (Neil Barr)
- We have elements of a new paradigm
 - Ecoservices etc
 - Carbon offsets market (Greenfleet et al)
 - New corporate players — e.g. VicSuper, MIS schemes, energy companies
- And we know areas that need to expand
 - Water conservation
 - Habitat restoration and reconnection
 - Residential (600,000 new homes)
 - Renewable energy (wind, solar, biomass, biogas)



28

Conserving and restoring landscapes

- The landscape needs to be re-plumbed, re-wired and re-clothed
- We need new regional planning approaches that:
 - are robust under a range of climate change & demographic scenarios
 - build in resilience thinking (e.g. improve habitat connectivity & buffering, protect refugia)
 - accommodate carbon pollution mitigation options (energy, transport, food)
 - safeguard productive soil
 - facilitate recycling of water, nutrients and energy
- Integrating and/or replacing regional catchment strategies and local government planning, zoning, rating and development approval processes
- **Role of parks in this scenario?**



29

Some ecological principles

- Develop long-term shared visions and from these, quantifiable objectives and constraints
- Manage the whole mosaic – not just pieces
- Patches can only be assessed and managed within the context of the whole landscape
- Manage in an experimental framework
- Don't do the same thing everywhere
- Single species/ecosystem management are complementary

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31

A high-performing parks agency in 2020 will:

- Be (and be seen to be) “the keeper of the long view”
 - Memory grounded in place-based knowledge
- Be valued for its knowledge and its learning
 - social and ecological
 - carbon literate
 - and for building knowledge and learning across the community
- Be seen as a highly collegiate and collaborative partner
- Work constructively way beyond the parks estate
- See its people and its knowledge as its key assets



32

A high-performing parks agency in 2020 will be:

- Influencing behaviour across the economy and society
 - and long-run institutional settings
- Using a wide mix of policy instruments strategically
- Putting robust numbers to Treasury (& everyone else)
 - Longitudinal approach fundamental
 - People, Process, Place measures
 - Links to long term monitoring studies
 - Partnerships essential
- Hard-wiring evaluation across the organisation



33

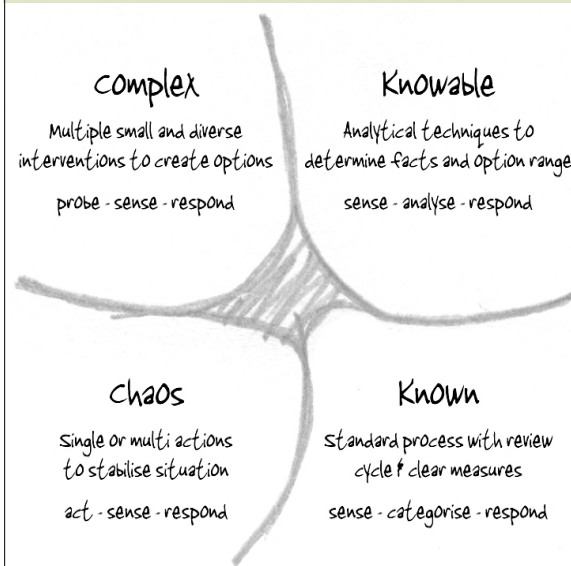
A high-performing parks agency in 2020 will be a **learning** and **knowing** organisation:

- **Evaluation and Knowledge Management are synergistic**
- Knowledge happens between the ears
- An individual cognitive process and highly contextual:
 - *“I only know what I know when I need to know it”*
- Revealed in **A**rtifacts (writing, art, formulae, products etc), **S**kills, **E**xperience, **H**euristics (rules of thumb) and **N**atural talent (**Dave Snowden**)
- Across quite different domains:
 - Including local, Indigenous, scientific, strategic (**organisational**)
- people default to known, trusted, accessible sources:
 - credibility, dialogue, easy access & honesty all critical
 - timing is crucial
 - knowledge is most useful when it is needed



34

Implications for knowledge needs [through the Cynefin lens]



- Climate change spans all of these domains
- If temp increase > 2°C, then disorder & chaos will reign
- The challenge is to handle the necessary range of simultaneous responses
 - to work in all of these domains at once
 - to develop a system-wide perspective
 - & the knowledge systems and learning strategies to underpin that perspective
- and to bring people along

The human dimension

- Managing whole landscapes
 - landscapes: “where nature meets culture” (Simon Schama)
 - landscapes are socially constructed
 - beyond ‘ecological apartheid’
 - sustainability means people management
 - engage values, perceptions, aspirations, behaviour
 - build knowledge grounded in a sense of place

Building ecological literacy

- We need to re-engage in a community debate about what we want our environment to look, smell, sound and feel like
- We need ecological literacy across the whole community
- Not just about biodiversity but water, energy, carbon, waste & food
- We need to redefine what it is to **be** Australian, to **live** like an Australian and to **farm** like an Australian
- Landcare and the various watch programs remain very relevant
- We need to re-engage schools, and the education system proper
- Make much better use of web 2.0 (& plan for 3.0) technologies
 - Wikis, Twitter, YouTube, FaceBook, Slideshow etc
- Nature conservation needs to work more closely with other sectors like renewable energy — cross the divide into the built environment!

Engaging the Community



Alliances and Leadership

- The 'biodiversity sector' is a cottage industry
 - disparate, fragmented, lots of small players, under-resourced
- There are other kindred interests
 - E.g. renewable energy, sustainable foods, green building, green transport
- Look to build broad alliances across sectors
 - E.g. health, transport, infrastructure, planning, education, green jobs
 - Scope out mutual interests, share resources & intelligence
 - Identify sympathetic cells across government, community & industry
 - Forensically search for and foster young emerging talent
- Invest in leadership
 - Work with e.g. Williamson, Fairfax, Australian Rural Leadership Program
 - Use leadership training to build networks
 - Recruit people with an outreach orientation



39

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40

Healthy Parks Healthy People

- On the right track
- Health is a huge issue getting bigger
 - Obesity costs \$21 billion (Access Economics 2005) & rising
 - But HPHP only some pixels in a much bigger picture
- Build evidence base to articulate linkages along 2 axes:
 - Eco-services
 - Human use and direct experience
- Agree that the 'protection culture' is a barrier
 - The nature and scale of human use probably needs to intensify to improve health outcomes at a societal scale



41

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42

Flying some kites

- Rethink CAR: is the engagement of people in and with parks Comprehensive, Adequate and Representative?
- Look at urban parks from the perspective of Food and Water Sensitive Urban Design
- Citizen science: if you don't do monitoring well, then outsource; NGOs working with schools and community groups?
- Work on your story
 - Get the internal narrative right, and walk the talk
 - As the platform for a conversation with the wider community



43

Our future is in our hands

“The future is not some place we are going to, but one we are creating. The paths to it are made, not found.”

— Phillip Adams

- We are in a mental dance between fate and desire
- We know that ‘what’s coming at us’ is big, ugly and scary
- We know that much of it we can’t influence
- But we do have choices, and some influence

“To decide not to succeed, is to decide to fail”



44

Take home messages

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 - **this is not a blip**
- Business as usual is not a viable trajectory, but we have choices...
- Increasing pressures on landscapes will squeeze nature
- Parks and park agencies have a critical role
- Healthy Parks, Healthy People is on the right track
- Making it real means forging new relationships and ways of working, and cultural & systemic change within
- Leadership is needed at all levels
- **GO FOR IT!**



45

For more info

www.triplehelix.com.au

www.acfonline.org.au/futurefoodfarm

www.clw.csiro.au/aclep/SoilDiscussionPaper.htm

www.climatechange.gov.au/impacts/publications/nrm.html



46