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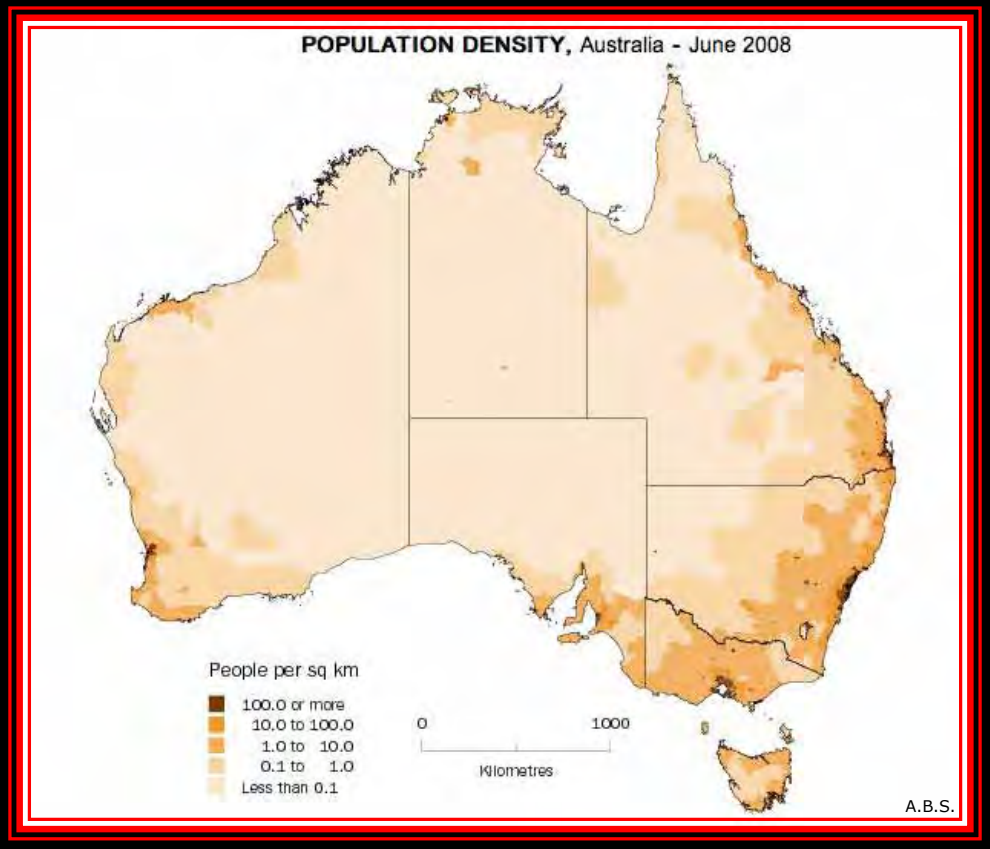
AUSTRALIA
LAND OF FRINGE DWELLERS

Reg Morrison



'By 2050 Australia's population will have grown from 22 million to 35 million.'

Australian Bureau of Statistics, 25 March 2010.

But this prediction is based on cultural statistics and fails to account for global events that are wholly dictated by biological evolution ...

Any debate that touches upon population is customarily hi-jacked by politicians, sociologists, demographers and media commentators—people who think only in cultural terms.

By contrast, the topic of 'population growth' belongs exclusively to the biological sciences.

POPULATION AND THE ENERGY TRAP

- **The universe is a thermodynamic system that is entropic (running down).**
- **The primary energy courier throughout the universe is hydrogen.**
- **Hydrogen fires the stars, enables genetic replication, and thereby maintains life.**

1. ENERGY

Biological existence requires a flow of energy, primarily via hydrogen, and all species are energy dissipators. A species' energy budget must therefore remain within a range that is appropriate to its bodymass and fertility rate, given its particular form, function and habitat.

2. REPRODUCTION

Reproduction ensures genetic survival, but it is also very energy expensive. So the two factors are unavoidably linked. It means that an increase in a species' energy consumption invariably leads to an increase in its rate of reproduction, and vice versa.

*Just as inadequate reproduction leads inevitably to extinction, unbridled reproduction leads to exponential population growth that outpaces the ability of the environment to replenish itself. The population then peaks and collapses due to starvation, disease, an accumulation of toxic waste, and a growing number of hormonal, genetic and epigenetic dysfunctions that are collectively known as Selye's General Adaptation Syndrome.**

Culture is a genetic device that evolved, in part, to regulate human fecundity.

*For further information on Selye's G.A.S. see: **"The Population Debate"**

Australia:
LAND OF EXTREMES

Iin drought years, grassfires rage unchecked across Australia's desert plains (NT).

Ice cave beneath a midsummer snowdrift, Snowy Mountains (NSW).

In wet years, ornithologists must use boats to visit the nests of desert birds (SA.)

Bed of the Darling, Australia's largest river, 1994. (NSW)

SALT: LIFE'S HIDDEN NEMESIS

Vast areas of the Australian continent are underpinned by salt-laden sedimentary strata laid down by repeated marine incursions and salt-laden sea winds. Where this salt re-emerges for various reasons, the regional biota shrivels and dies.

A salt-encrusted shrub, Lake Eyre, SA (1985).

The salt-encrusted bed of The Lost River near the western edge of the Great Sandy Desert in north-western Australia.

DRYLAND SALINATION

Soluble salts are a major component of the substrata in many regions of the world and may be brought to the surface when water tables rise. The long tap roots of trees act as pumps and usually prevent this. But should those natural pumps be removed to make way for stock or crops, it frequently ensures that agriculture eventually becomes impossible due to the accumulation of salt at the surface.

This process, known as dryland salination, has been going on for thousands of years all round the world, notably in the Middle East, India and China, and has already rendered large tracts of formerly productive land infertile. Australia, the world's driest inhabited continent, is one of the newest victims of this insidious process, and is one of the worst affected.

Government-supported logging and land clearing initiatives in eastern, southern and western Australia have already poisoned large areas of formerly productive agricultural land, and the problem is still growing.

Lake McLeod saltfarm.

The vast embayment known as Lake McLeod on Australia's north-western coast is kept saline by a combination of tidal seepage, spray-loaded sea winds and seepage from several saline springs. The bay has a commercial saltfarm near its southern mouth.

Salt-poisoned pasture in the Murray Valley near Ouyen, north-western Victoria.

Flood Irrigation, the world's oldest arid-farming failure

The bulk of Australia's modern population is currently locked to the continent's southern regions and to biotas that are gradually wilting under the combined assault of the deteriorating climate, shrinking water resources, salinisation and irrigation-based agriculture.

One might be forgiven for thinking that the close link between irrigation and salination had only recently been discovered, yet salination led to the demise of several of the world's earlier civilisations, including its oldest, the Sumerian, in Mesopotamia (now Iraq).

Having given birth to written language, mathematics, black-letter law, and irrigated farming, this complex, farm-based culture appears to have finally surrendered to the insidious creep of salinisation about 4,400 years ago.

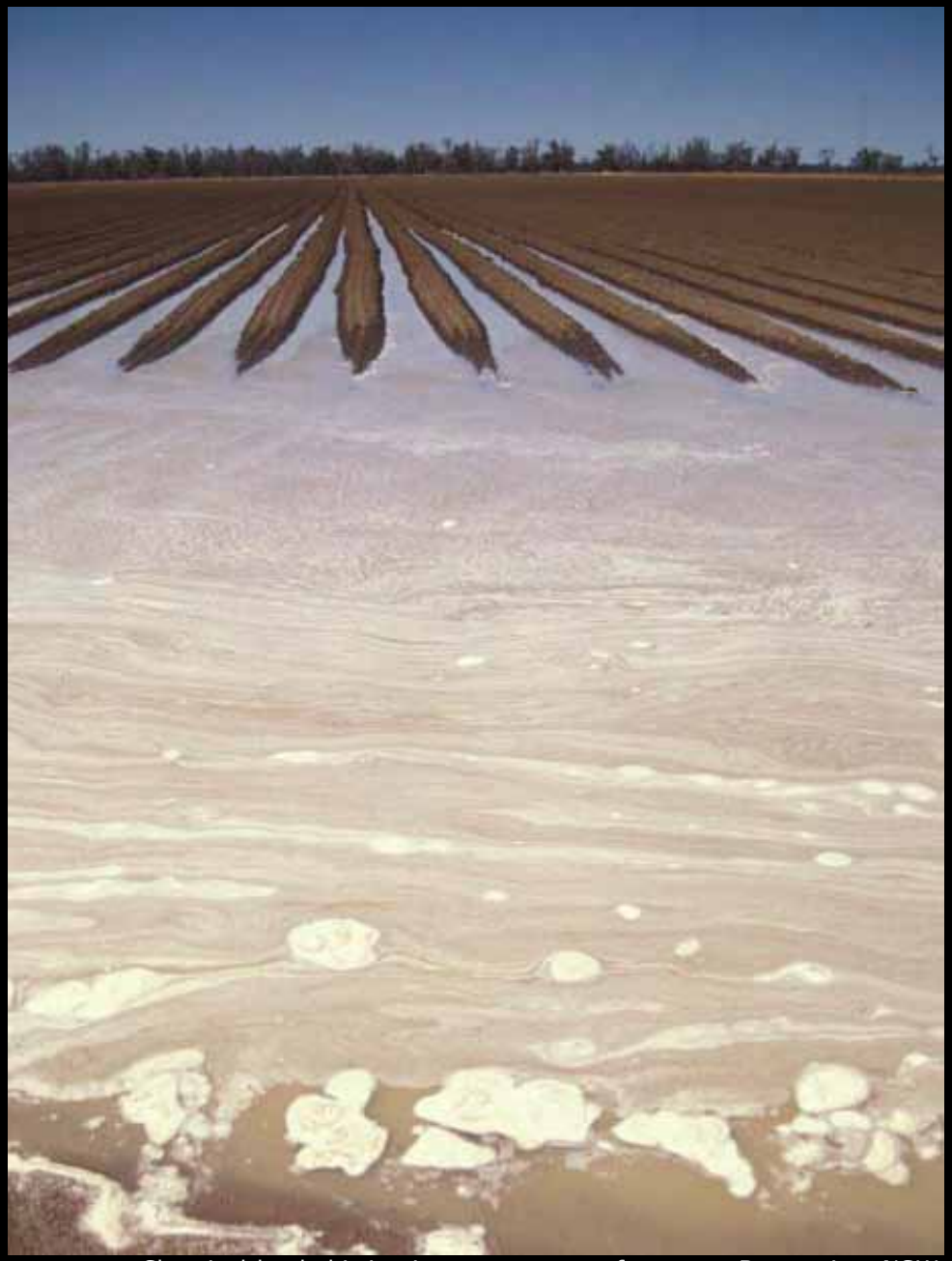
Despite improved farming techniques and the introduction of salt-tolerant species such as barley, an average harvest decline of less than 0.1% over a period of 700 years eventually rendered all irrigated cropland infertile, causing the entire civilisation to crumble and the people to disperse. Southern Iraq, once part of this renowned "fertile crescent," remains a semi-sterile, salt-poisoned desert.

Australia's huge, water-hungry cotton farms are run on a far grander scale than those in early Sumer, and the environmental degradation that they bequeath will collapse the region's agriculture productivity in a fraction of the time.

Meanwhile the run-off from these frequently flooded plains is loaded with a toxic stew of insecticides, herbicides and defoliants (RIGHT). This enters the groundwater and the regions ailing river systems, making all of them undrinkable—for animals as well as humans.

Inevitably, the infection spawned by such inappropriate agriculture spreads throughout the river system, bearing out the rigid rule of entropy that is universally imposed by our thermodynamic cosmos:

'High yield is just a euphemism for high cost.' *



Chemical-loaded irrigation water, cotton farm near Brewarrina, NSW.

*Further reading: ***"The Population Debate"*** Also: ***"Life's Maker and Breaker"*** pp.21, 23, 43, 71.

Dead Coolibah woodland, Macquarie Marshes, NSW.

Excessive water extraction from the vast Murray Darling river system in order to irrigate cotton and other crops in southern Queensland and northern New South Wales has repeatedly drained crucial wetlands such as these, in the Macquarie Marshes, north-west of Warren.

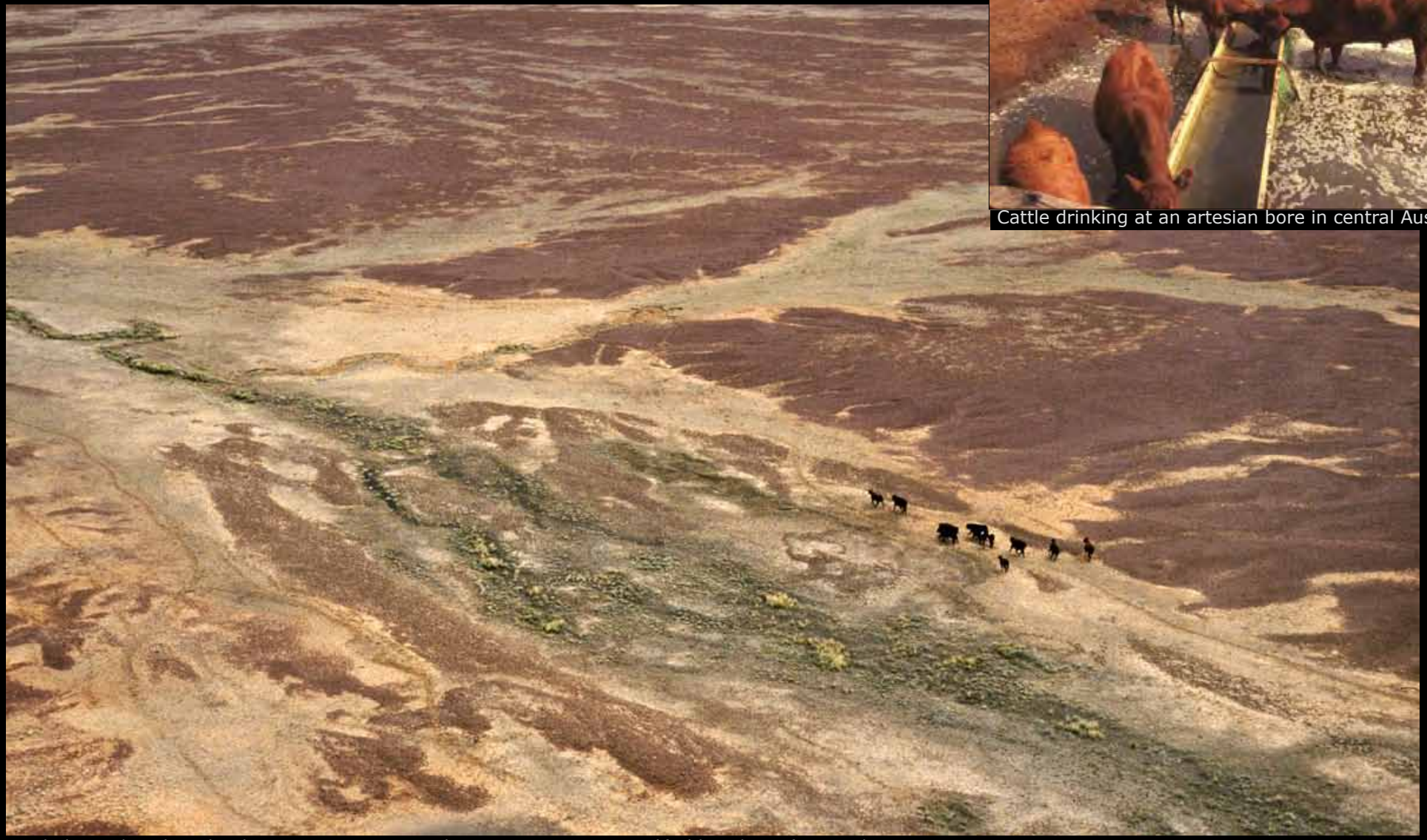
Redgum forest (Eucalyptus camaldulensis), Murray Valley, VIC.

This forest of River Redgums was drowned by an irrigation impoundment that was constructed west of the Hume Weir in northern Victoria during the 1930s. Most of the trees in the main body of the reservoir, known as Lake Mulwala, were felled by local residents but were never removed. Their trunks will continue to decay in the lake's mud and emit a steady plume of methane for hundreds of years to come—as will the trees shown here when their bases rot and they too fall and become food for methanogenic bacteria in the anoxic mud.

HUMAN GENERATED DESERTIFICATION

By tapping into Australia's ancient artesian basins modern Australian farmers have managed to maintain huge herds of wholly unsuited herbivores throughout Australia's semi-desert heartlands—even in the leanest of years. Their hard hooves ensured that the fragile algal-fungal crusts that once limited excessive erosion have been broken up and most of the remaining nutrients have blown away.

Cattle drinking at an artesian bore in central Australia.



Cattle linger beside a dried-up water course amid a vast stone-encrusted 'gibber desert' in south-western QLD.

Dead Mulga (*Acacia aneura*), near Finke, NT.

When cattle were released into this mulga woodland near Finke in central Australia, they ate the few grasses that kept the soil together, their hooves destroyed the desert's protective crust, its meagre topsoil blew away, and the region began the long descent into sterile desert.

An open-cut iron mine (Mount Tom Price), Pilbara, WA.

The iron-rich seabed that forms much of the Hamersley Ranges in Western Australia's Pilbara region marks a crucial turning-point in evolution when explosive blooms of photosynthetic bacteria discharged so much oxygen into the biosphere that it rusted the sea's iron and deposited all the world's major ore bodies. It also nurtured a wholly new, oxygen-dependent branch on the tree of life, the eukaryotes.

Queen River, south-western Tasmania.

The lush temperate rainforest that once fringed the Queen River in western Tasmania, became replaced by a chain of rusty orange pools, each one full of fallen branches, tree stumps, and effluent from the Mt. Lyell coppermine. It became Australia's most polluted river.

Mount Lyell, western Tasmania.

Before mining began in the 1880s, these mountains near Queenstown in western Tasmania were clothed in ancient temperate rainforest. Toxic mine fumes, timber cutting and commercial logging stripped them bare. This is Australia’s most spectacular environmental disaster.

The Mine Canary

Like most nations, Australians are currently asset-stripping their continent via mining, commercial monoculture and over-stocking, irrigation, logging, urban expansion, industrial and agricultural pollution and spectacularly excessive consumption.

The continent's inland waters and marine resources are in similar decline due to pollution and rapacious overfishing.

Australia's impoverished soils and empty rivers will thereby ensure that any deterioration in the global climate will impact savagely on this flattest and driest of continents, subjecting it to episodes of savage flooding and sustained drought.

As Australia's arid zone and monsoonal rainbelts gradually migrate polewards and its agricultural regions gradually descend into desert, this formerly reliable supplier of food and fibre is about to become a 'mine canary' for the rest of the world.

POLLUTION: Moomba rubbish, Melbourne, VIC

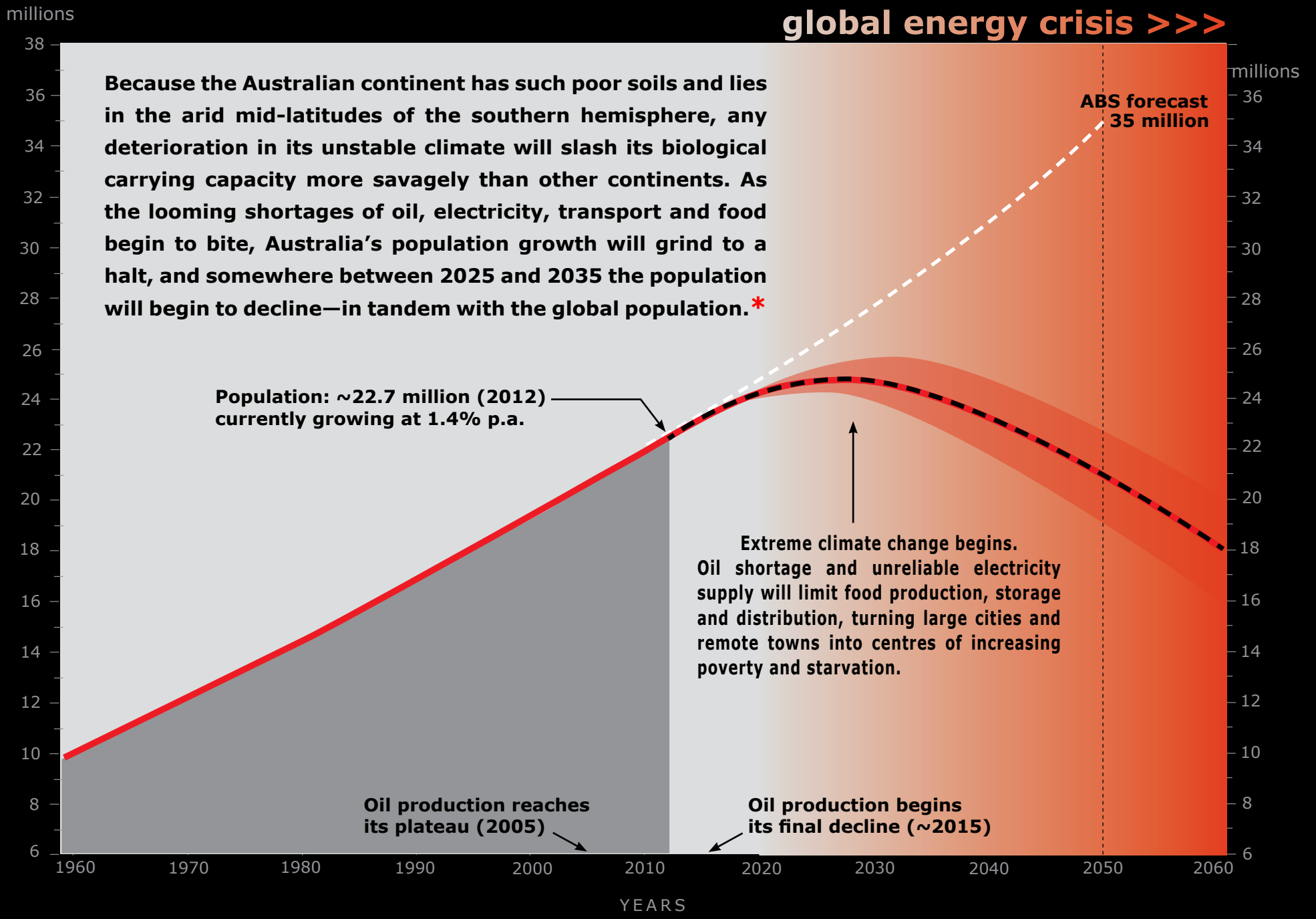
DESERTIFICATION (Macquarie Marshes, NSW)

CONSUMPTION (NSW)

INDUSTRIAL POLLUTION (steel mills, NSW)

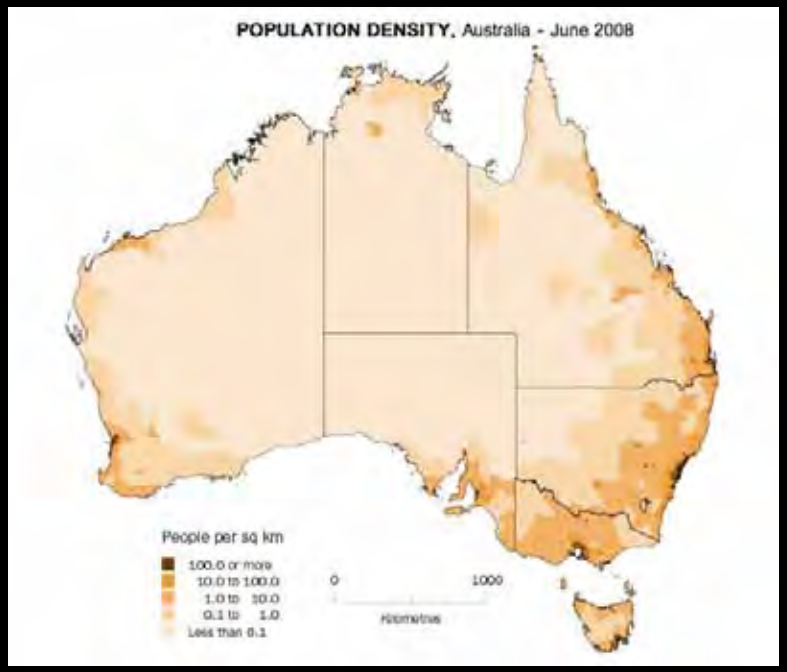
SALINATION (land clearing, Murray Valley, VIC)

Australia's Population



*Further reading: ***"Life's Maker and Breaker"*** page 32. Also: ***"The Population Debate"***

WHEN FRINGE-DWELLERS FACE EVICTION ...



The bulk of Australia's small population has remained locked to the continent's coastal fringes for the past two centuries, leaving the main body of the continent virtually unoccupied.

As the world's arid zones move polewards and Australia's southern half becomes less habitable, its agricultural yield will shrink, its rivers will slow to an intermittent trickle and its human population will begin to look northward.

But in the monsoonal north of this continent the environmental threat is precisely reversed: too much water on a very intermittent, grossly uncontrollable basis.

Meanwhile, any coherent attempt to induce Australia's fringe populations to migrate northward is likely to be forestalled by the looming oil decline, with all its attendant C3 crises—communication, computation and control.

Throughout history, humans have always managed to survive the savage environmental threats hurled at them by this planet's chaotic climate system. But then they usually had some kinder, less populated place to which they could escape ...

The Australian Bureau of Statistics proposition that Australia's population will grow to 35 million by 2050 constitutes a scenario that defies belief—except of course by economists and others who know nothing of biology, climate science or evolution.

There is no longer any point in blinding ourselves to these unpalatable facts. The information laid out here need not be widely broadcast, but those who make policy decisions that affect Australia's future should at least be aware of these facts and of their sound biological and evolutionary foundations.

The inane mystique: ‘perpetual exponential growth’

(Exponential growth occurs when a number is multiplied by a fixed percentage at regular intervals.)

More than two centuries have passed since the Reverend Thomas Malthus accurately identified the potentially catastrophic discord that exists between reproductive growth (inherently exponential), and the linear increase that is avaiable in agricultural production.

Australia’s population had reached 10 million by 1960, and has since grown exponentially at almost 1.9% a year. Growth in agricultural production kept pace with this explosive population growth for the first decade or so, but since 1973 population growth has consistently outrun the growth in agriculture. Such exponential population growth now means that during extreme-drought years, this nation, once one of the world’s largest food exporters, even has to import small quantities of grain to use as stock feed.

Only those who are ignorant of Malthus and of the catastrophic ramifications of exponential population growth will fail to see the significance of this. Meanwhile all economists and most politicians remain beguiled by the concept of perpetual exponential economic growth. Such mystical devotion to this ridiculously impractical ideal is a useful emotional weapon in political manifestos and other propaganda, but it only serves to obscure the grim reality that is dictated by the Laws of Thermodynamics:

‘High Yield’ is just a euphemism for ‘Higher Cost’ in the longer term.

Australia has a surface area of 760 million hectares, and of this, about 220 million hectares (~30%) is true desert. Because of climate unreliability another 380 million hectares (50%) is fully productive only on an occasional basis. This leaves about 160 million global hectares, mostly along the continent’s eastern and south-western margins, that are ‘reliably productive’ ... most of the time!

Meanwhile, it takes more than 9 Gha to sustain each of Australia’s 22.6 million people. In other words, although we require at least 200 million Gha to fully sustain our particular brand of extravagant technoculture, we can only rely on production from about 160 million Gha of it. In bad years (flood or drought), Australians must now support themselves by importing additional food from elsewhere.

Clearly, Australia is already overpopulated and unsustainable.

Yet both major political Parties still believe that population growth via immigration is a defensible!