



Critical Horizons – Defining our Future

**Environmental Sustainability in the South West –
Is it Achievable?**

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Chairman
Environmental Protection Authority
Friday, 16 February 2007**

1. Current Performance
2. Towards Sustainability
3. Conclusions



State of the Environment - 2006

- Issues
- Fundamental pressures
- Human settlements
- Biodiversity
- Land
- Inland Water



2006 SoE Report – prioritised issues



Climate change

**Population &
consumption**

**Greenhouse gas
emissions**

Introduced animals

Weeds

Phytophthora dieback

Land salinisation

**Salinisation of inland
waters**

Particulates

Changed fire regimes

Clearing

Soil erosion

Altered water regimes

Loss of wetlands

**Loss of fringing &
instream
vegetation**

**Degradation of marine
habitat**

Settlement patterns

Photochemical smog

Soil acidification

**Acidification of inland
waters**

**Erosion & sedimentation
of inland waters**

Eutrophication

Introduced marine pests

Transport

Water use in settlements

**Energy use in
settlements**

Waste generation

Heritage conservation

Indoor air

Air toxics

Oxides of nitrogen

Overgrazing

Trawling

Land contamination

Marine contamination

Support for heritage

**Statutory protection of
heritage**

Stratospheric ozone
depletion

Sulfur dioxide

Carbon monoxide

Red = South West related

Implications of Climate Change

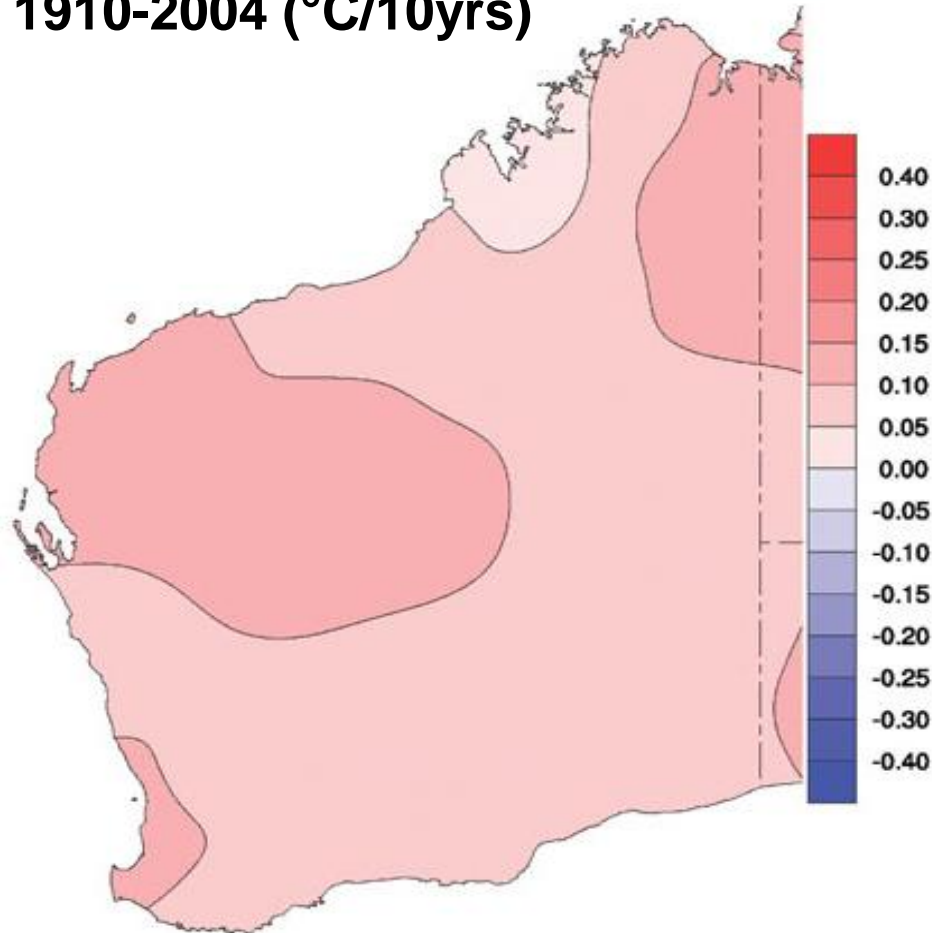
- Climate change will impact on biodiversity:
 - some species will adapt to climate change and some will migrate.
- Coastal settlements will be vulnerable to sea level rise.
- Reduced rainfall will limit the availability of suitable agricultural land (State Water Strategy 2006).
- Reduced water run-off into storages and groundwater.
- Rural communities will be affected by changes in agricultural productivity and profitability.
- Increased fire hazard to rural communities and agriculture.
- Potential disease outbreaks, e.g. mosquito born viruses (SoE 2006).



FUNDAMENTAL PRESSURES – Climate Change

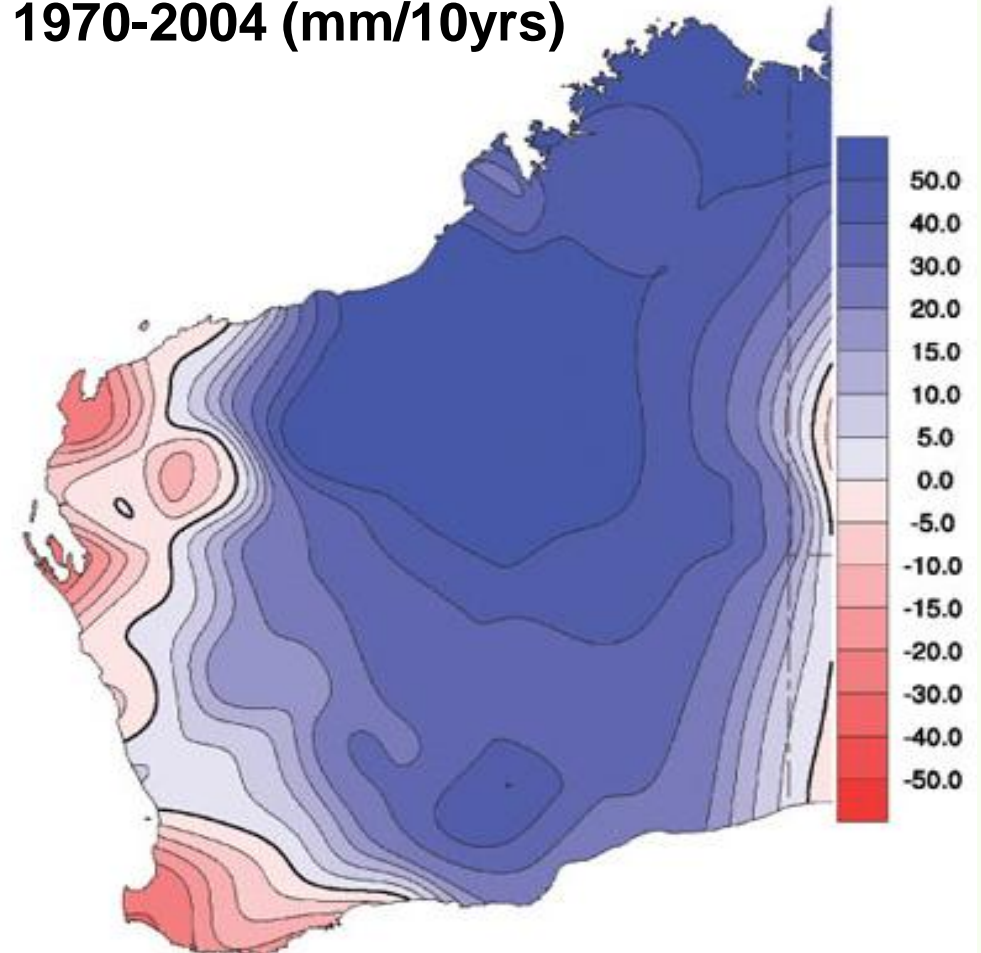
Trend in mean temperature

1910-2004 ($^{\circ}\text{C}/10\text{yrs}$)



Trend in annual total rainfall

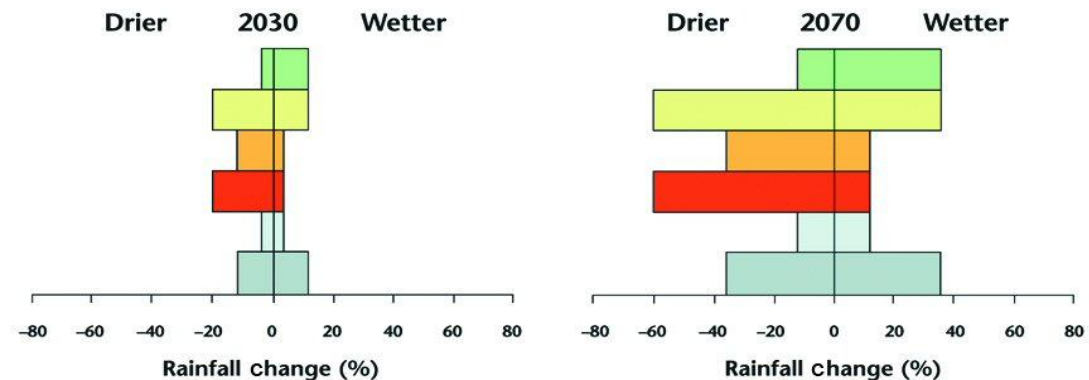
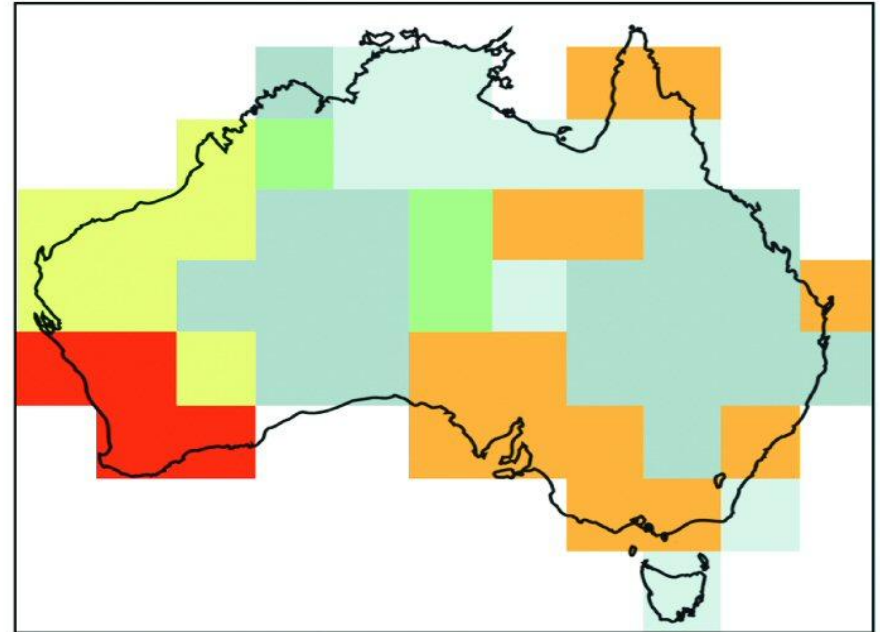
1970-2004 (mm/10yrs)



FUNDAMENTAL PRESSURES – Climate change

Projections

- Temperatures throughout the State will increase
- Much of the South West will experience decline in rainfall



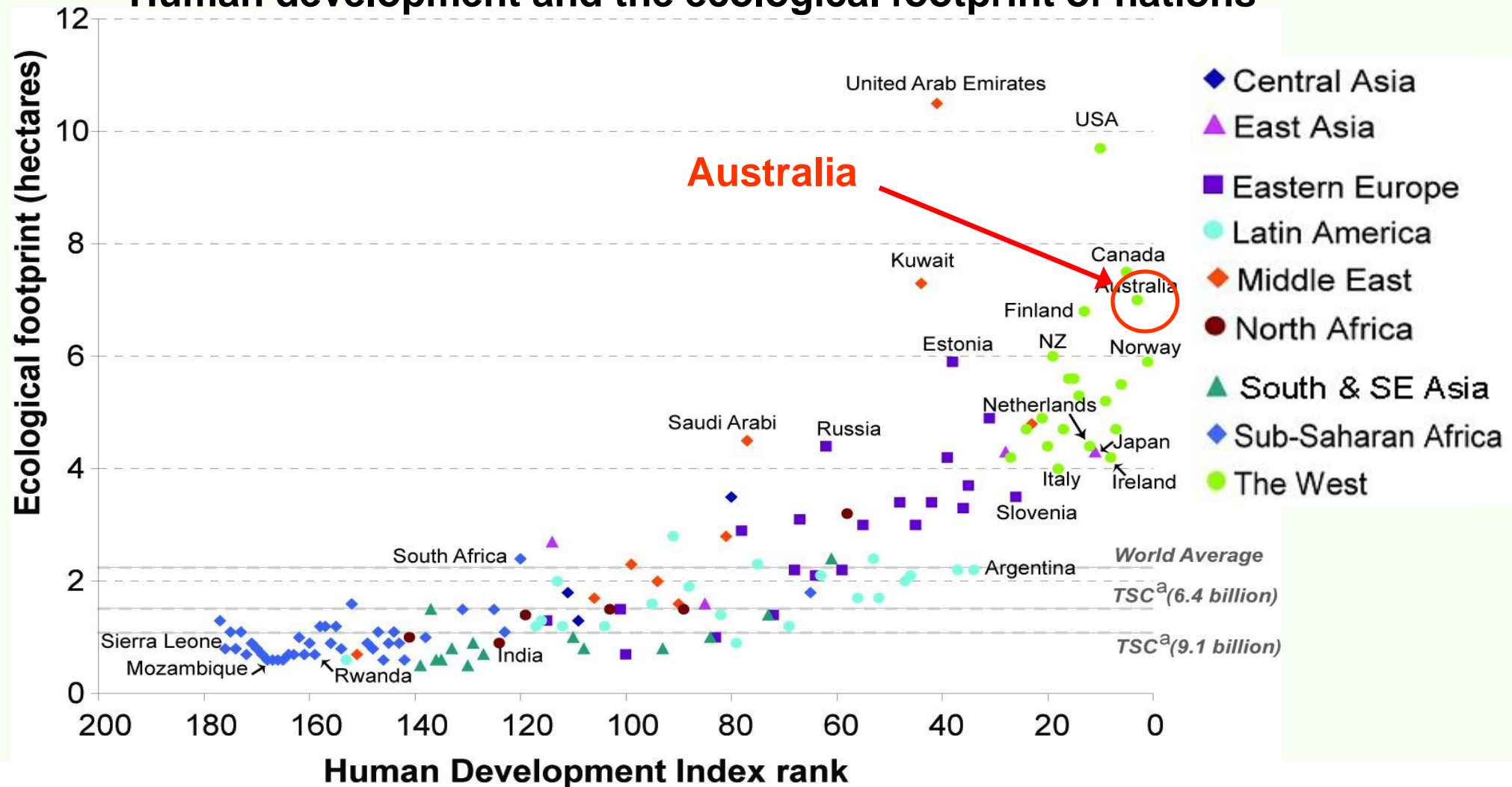
FUNDAMENTAL PRESSURES – Population & Consumption



- Population growth rate in WA = 1.5% per year
- Population distribution and consumption of natural resources in WA has influenced the nature and distribution of environmental impacts
- West Australians have among the highest personal rates of consumption in the world

FUNDAMENTAL PRESSURES – Population & Consumption

Human development and the ecological footprint of nations

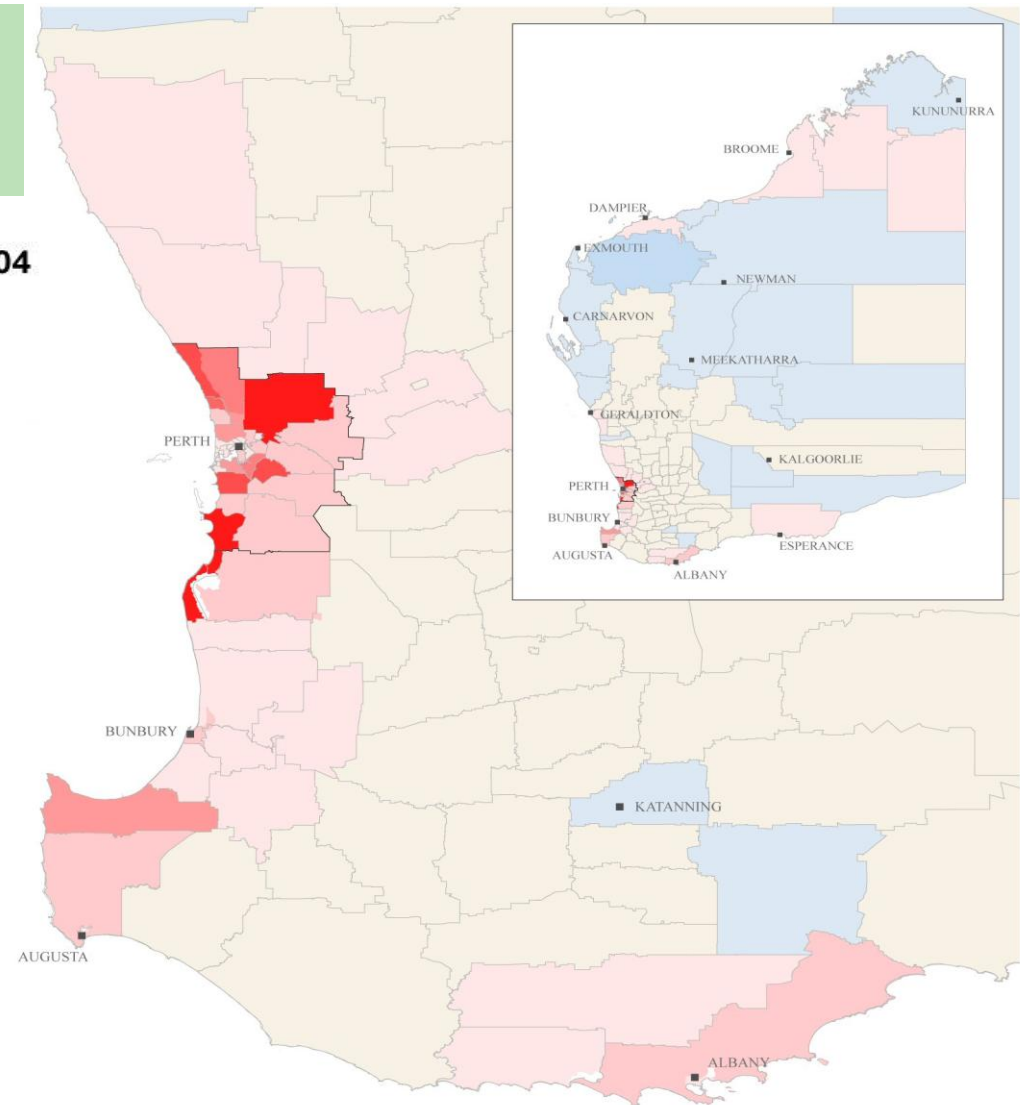
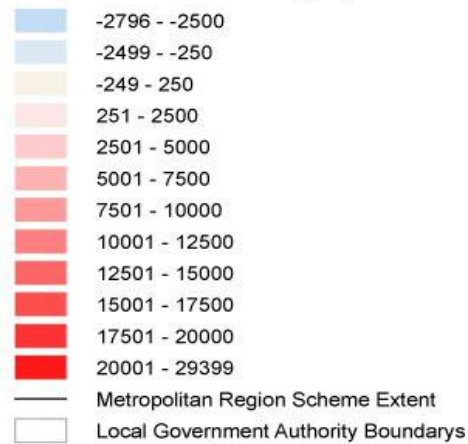


HUMAN SETTLEMENTS – Settlement patterns

Population change

Legend

Population Change (number of people) - 1996-2004



HUMAN SETTLEMENTS – Transport

- ↑ Total vehicle kilometres travelled
- ↑ Number of vehicles per head of population
- ↑ Air travel
- ↑ Transport energy use
- ↑ Greenhouse gas emissions from transport
- ↑ SO₂, NO_x, CO and particulates in Perth
- ↓ Mode share of public transport, walking and cycling
- ↓ VOCs and lead
- ↑ Number of public transport journeys



HUMAN SETTLEMENTS – Household water use

Legend

Average Water Use (kL/capita)

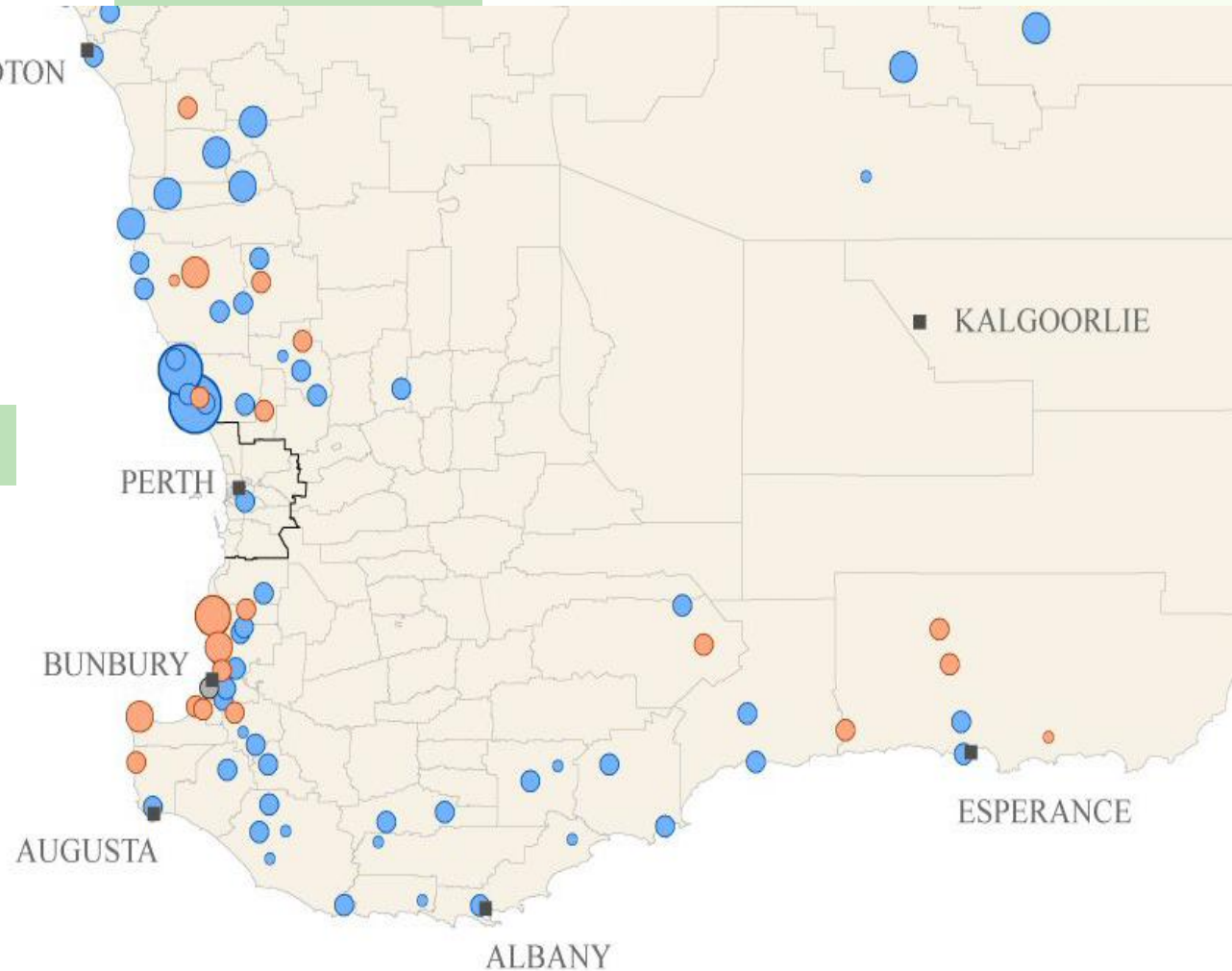
- 0 - 100
- 101 - 200
- 201 - 300
- 301 - 400
- 401 - 500
- > 501

- Metropolitan Extent
- Local Government Boundaries

Water Consumption Trend (1998-2004)

- increasing
- no change
- decreasing

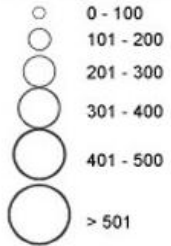
Per capita water use



HUMAN SETTLEMENTS – Household energy use

Legend

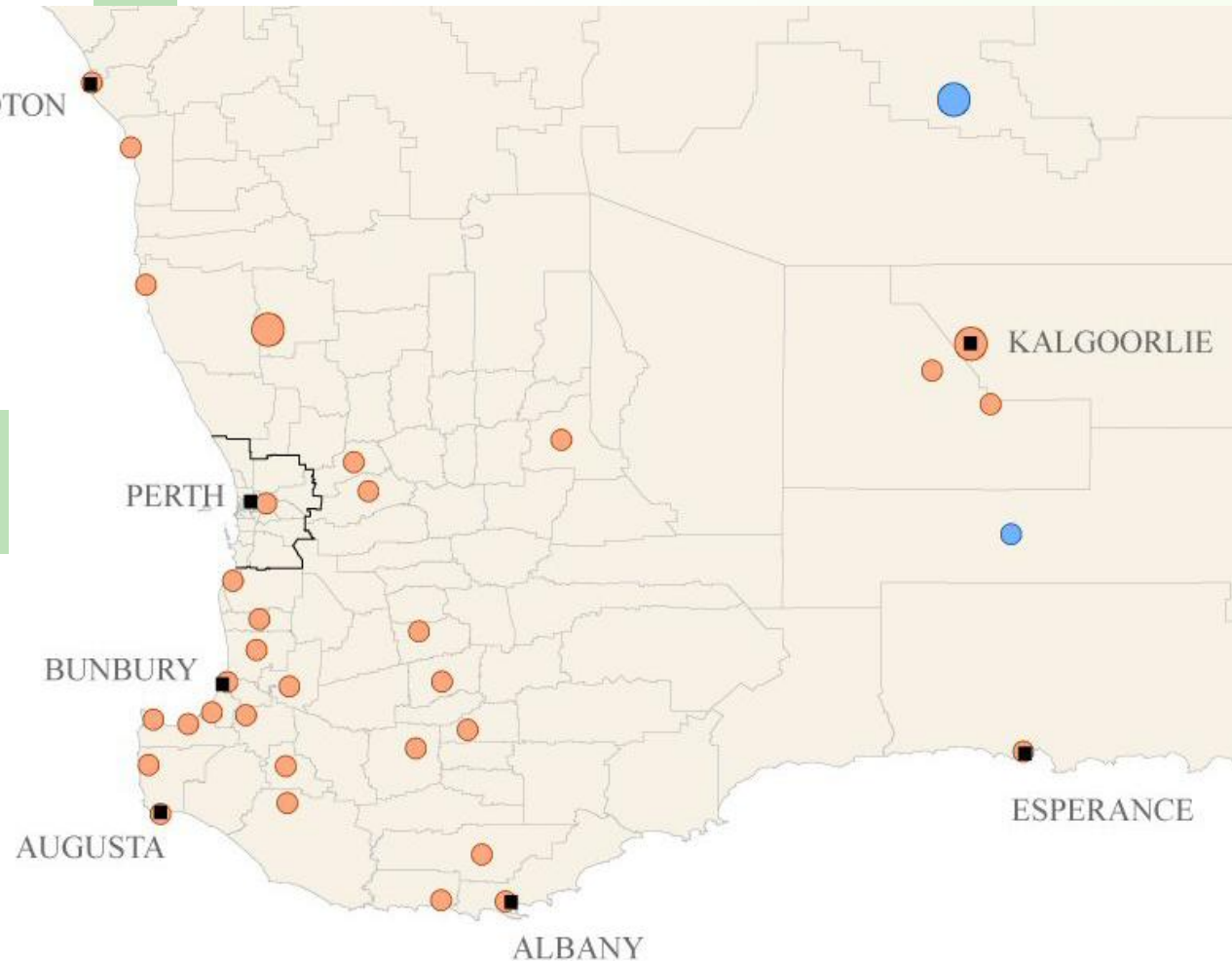
Average Electricity Consumption (kWh)



Electricity Consumption Trend (1998-2004)



Average household
electricity use



HUMAN SETTLEMENTS – Waste



- X WA has the highest per capita rate of solid waste generation in Australia
- ↑ Household waste generation is growing
- ↑ Recycling is increasing
- X WA will not meet the Waste 2020 target of zero waste to landfill if current trends continue

BIODIVERSITY – issues



- Changed fire regimes
- Clearing
- Introduced animals
- Weeds
- Phytophthora dieback
- Overgrazing
- Trawling

- **BIODIVERSITY – Changed fire regimes**



- **BIODIVERSITY – Introduced animals**



- **BIODIVERSITY – Weeds**



Blackberry



Arum lilies



Indicative extent



Salvinia

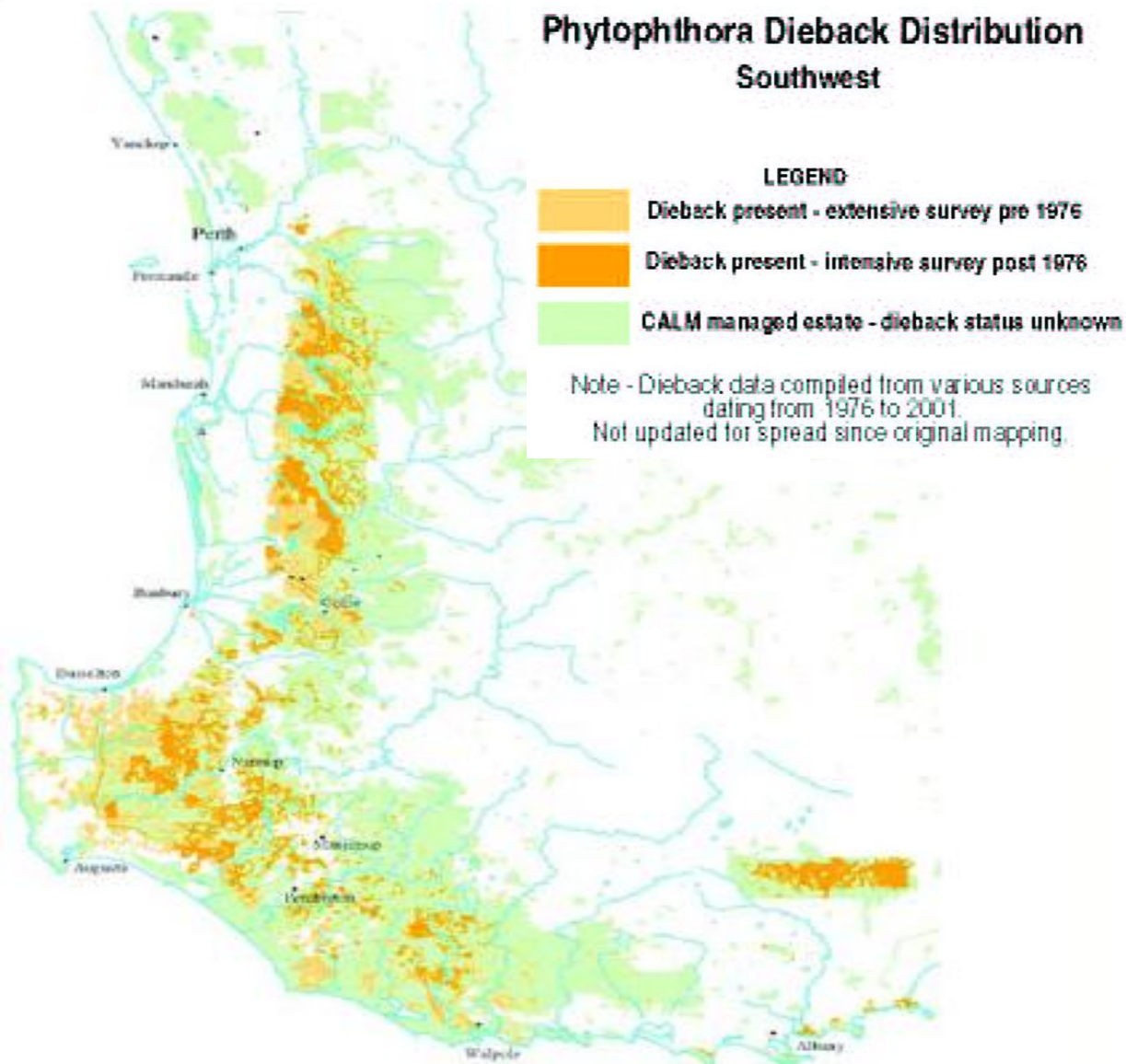


Bridal creeper

- **BIODIVERSITY – Phytophthora dieback**



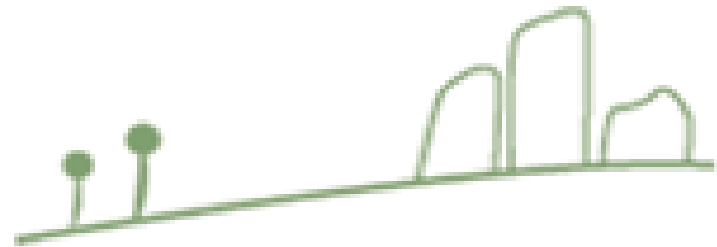
BIODIVERSITY – Phytophthora dieback



- Up to 40% of South West flora are at risk
- Spread by water movement through soil and transportation of soil
- There is no cure
- Abatement action is not always successful and requires ongoing application

LAND – Major issues

1. Land salinisation
2. Soil acidification
3. Soil erosion
4. Land contamination



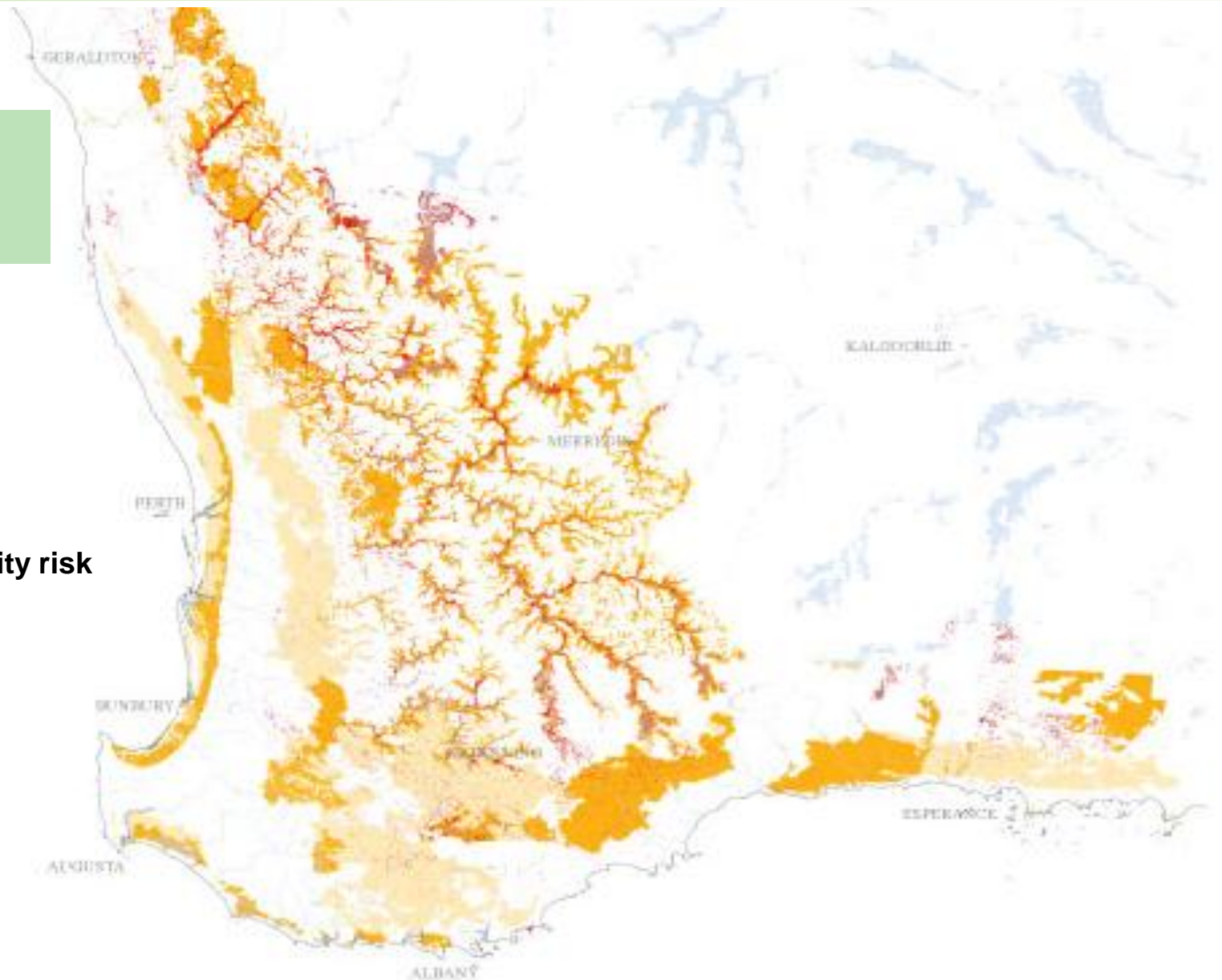
LAND – Land salinisation



LAND – Land salinisation

Legend
Current extent and salinity risk

- Salinity extent
- Salinity risk 2020
- Salinity risk 2050



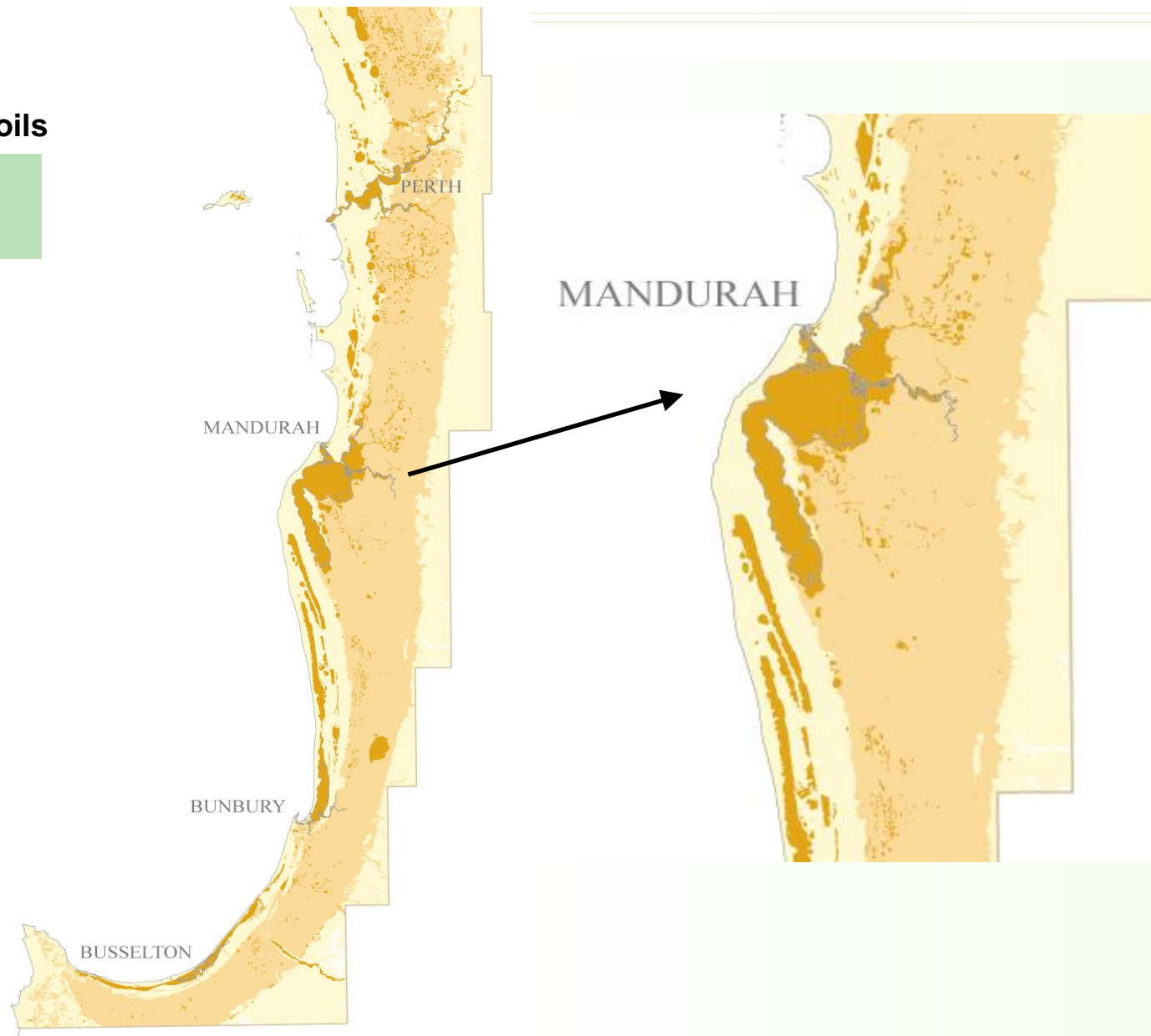
LAND – Acid sulfate soils



LAND – Acid sulfate soils

Legend Risk of acid sulfate soils

- High
- Low
- None

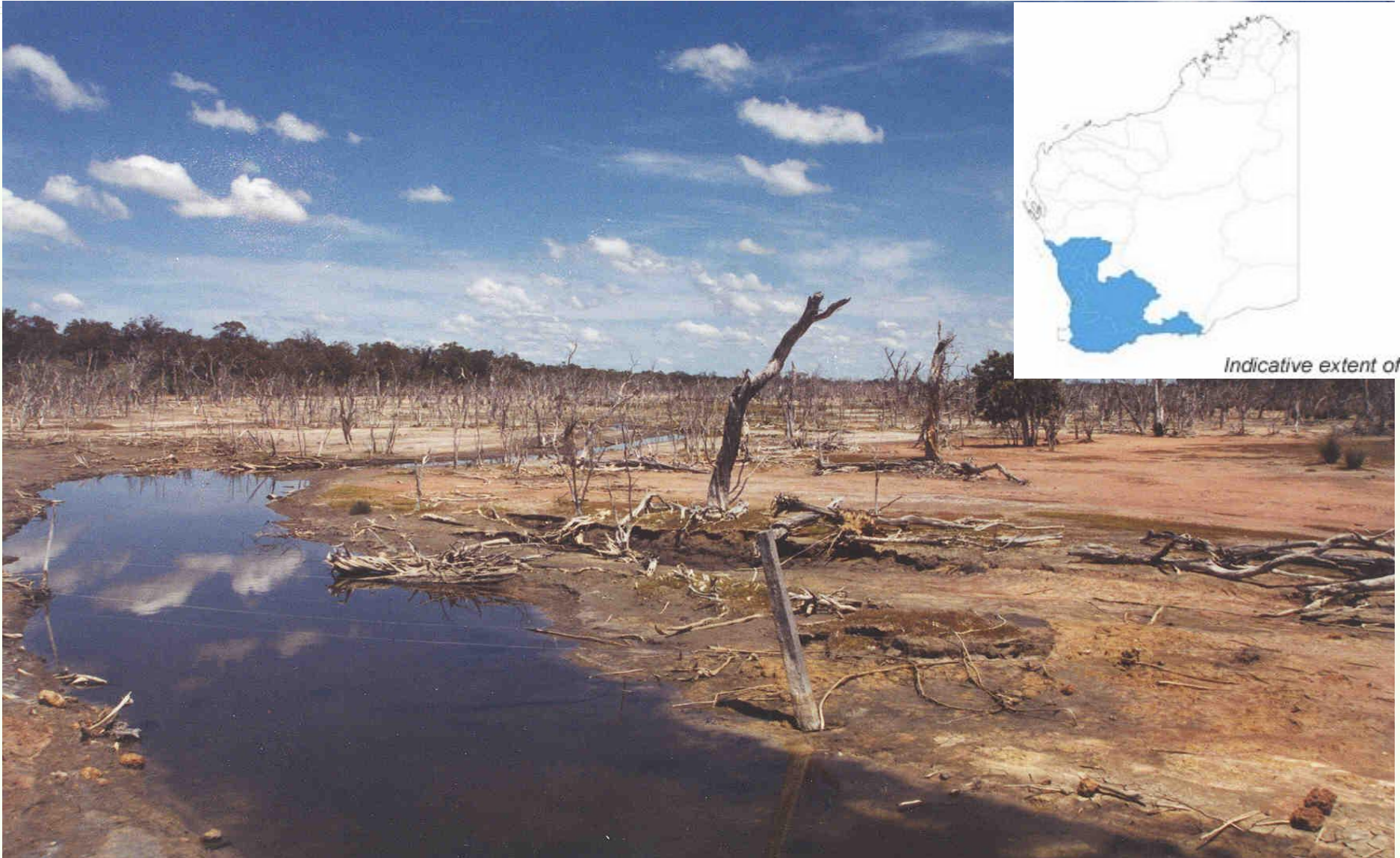


INLAND WATERS – Overall condition



- 77% of estuaries are in good condition.
- 32% of major rivers are in good condition.
- Wetland condition remains largely unknown.

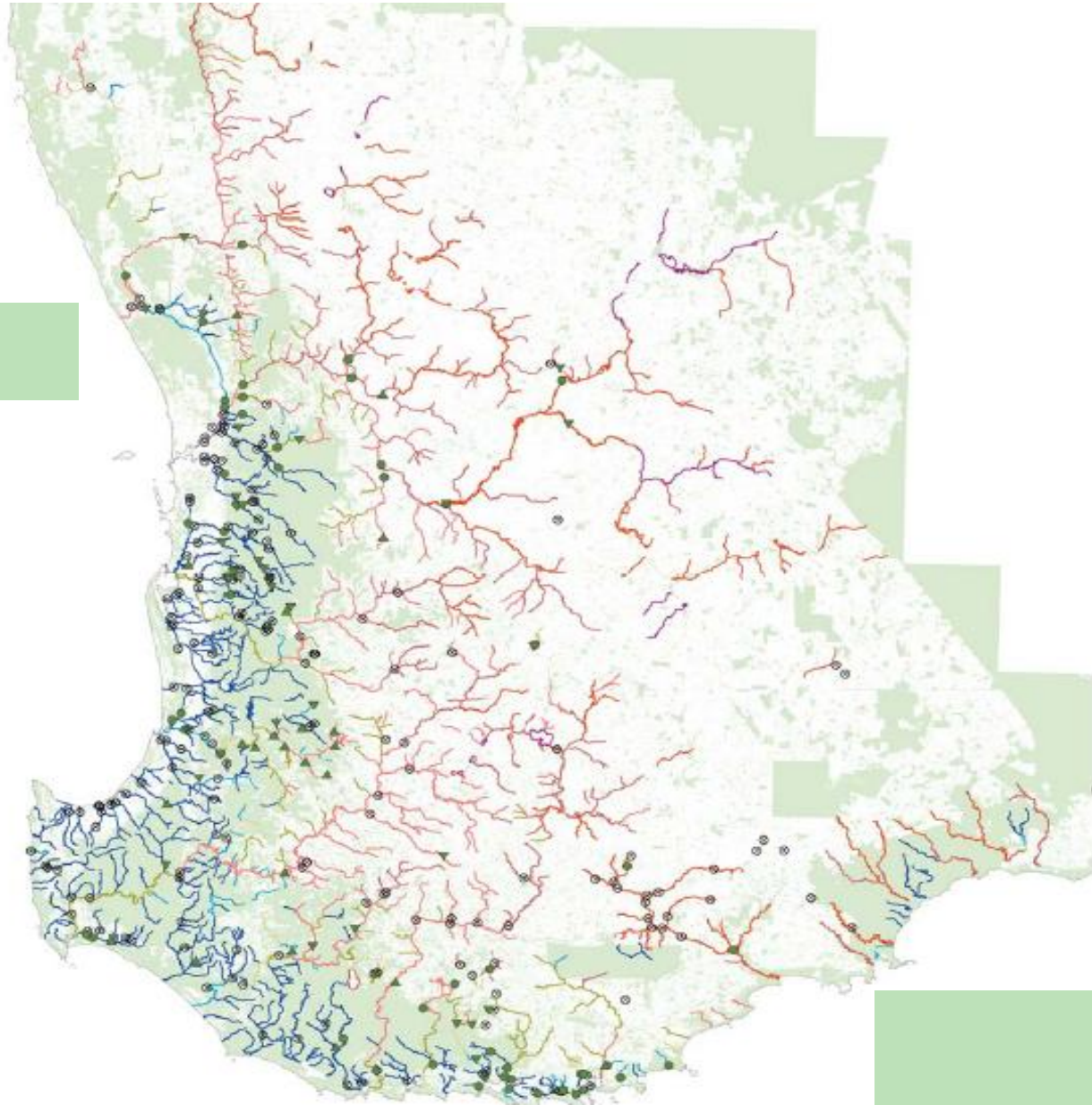
INLAND WATERS – salinisation of inland waters



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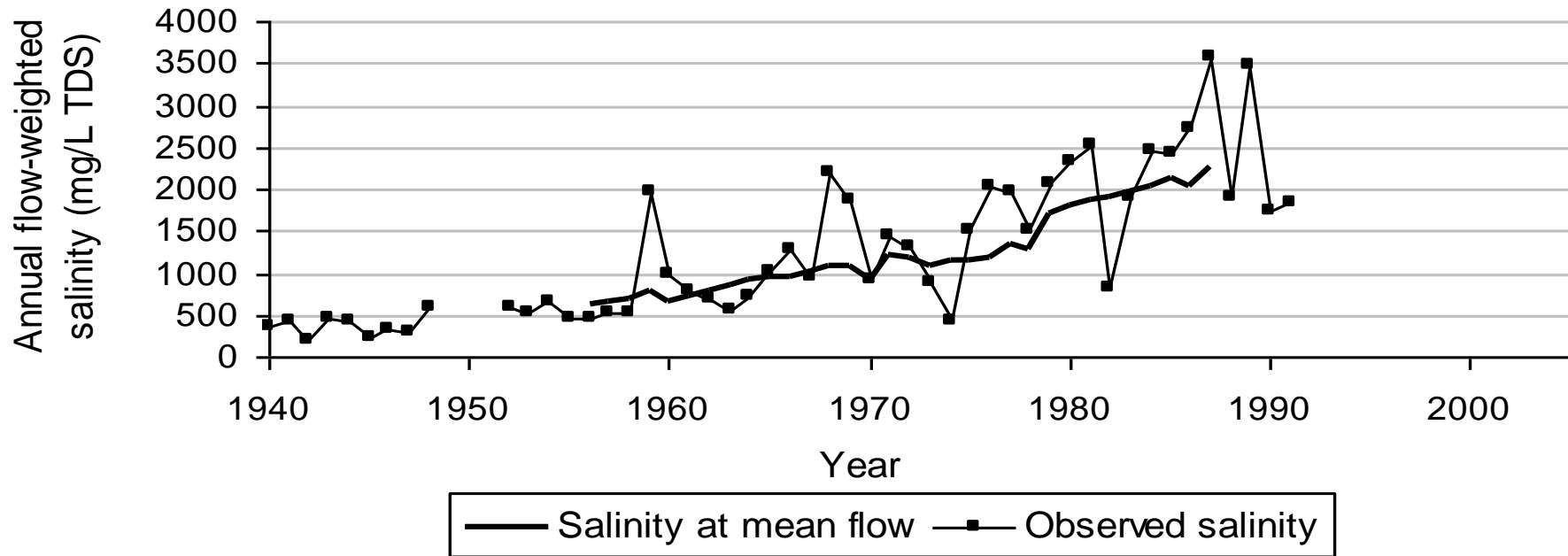
Legend River salinity

Fresh
Marginal
Marginal-brackish
High brackish
Low saline
Mod saline
High saline
Hyper saline



INLAND WATERS – salinisation of inland waters

Blackwood River salinity



INLAND WATERS – loss or degradation of wetlands

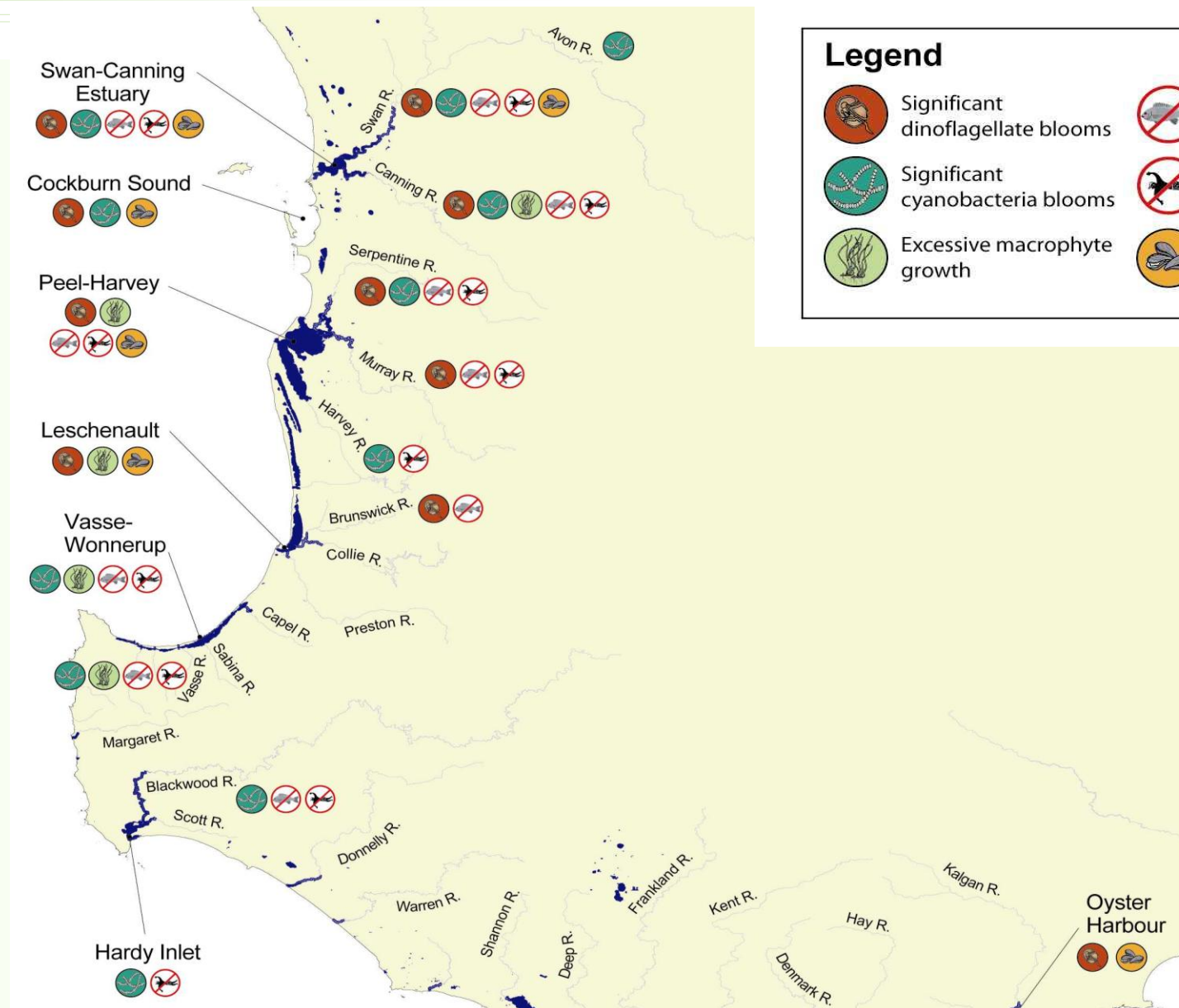


INLAND WATERS – loss or degradation of wetlands



- In general South West wetlands are under severe threat.
- Over 25% of important SW wetlands are actively degrading.

INLAND WATERS – eutrophication



Conclusions

- Not environmentally sustainable
- We are losing the very things that attract people to the South West to live, work and recreate



TOWARDS SUSTAINABILITY



- Sustainability challenges us to ensure a better future by balancing environmental protection, social advancement and economic prosperity.
- How are our industry sectors going?
- What else do we need to do?

TOWARDS SUSTAINABILITY – agriculture

Using natural resources:

- Agriculture is adopting sustainability principles.
- ✓ Life cycle analysis (assessing production process from beginning to end) can focus on inefficient stages of production.
- ✓ Energy efficiency is improving.
- ✗ Fertiliser use efficiency is declining.



TOWARDS SUSTAINABILITY – conservation

Conserving natural resources:

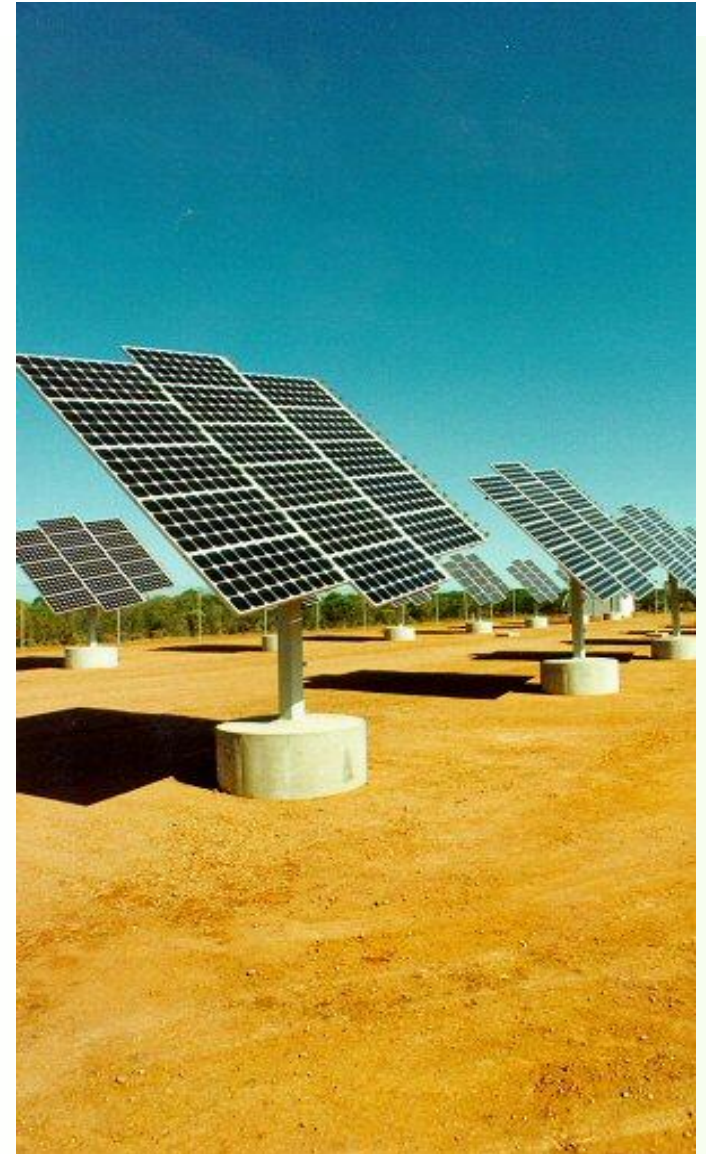
- Conservation aims to protect natural resources for the long term.
- Target is to have 15% level of reservation per bioregion.
 - ✓ 20% bioregions meet the target.
 - × 48% have less than 5% reservation.
 - × 11% have 0% reservation.



TOWARDS SUSTAINABILITY – energy

Using energy related products:

- Energy produced using natural resources (eg. oil, coal, wood, solar, wind, etc).
- × Energy consumption is increasing at 2.7% every year.
- × Only 2% of energy comes from renewable energy sources (eg, wood heating or solar water heaters).



TOWARDS SUSTAINABILITY – fisheries

Using fish stocks:

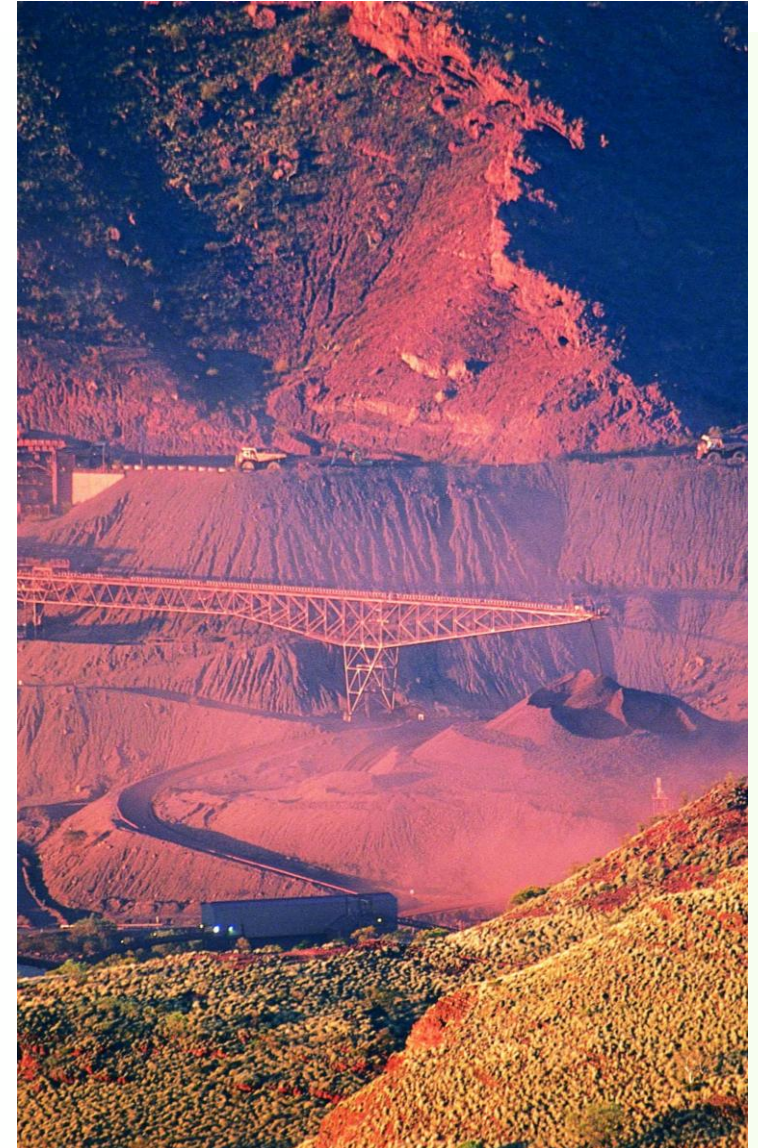
- ✓ 85% of WA fisheries have sustainable yields set.
- ✗ 9% of fisheries are above sustainable yield.
- ✗ 71% of fisheries are at the sustainable yield.
- ✓ Fisheries is moving towards independent audits.



TOWARDS SUSTAINABILITY – mining & petroleum

Using minerals, ores, petroleum:

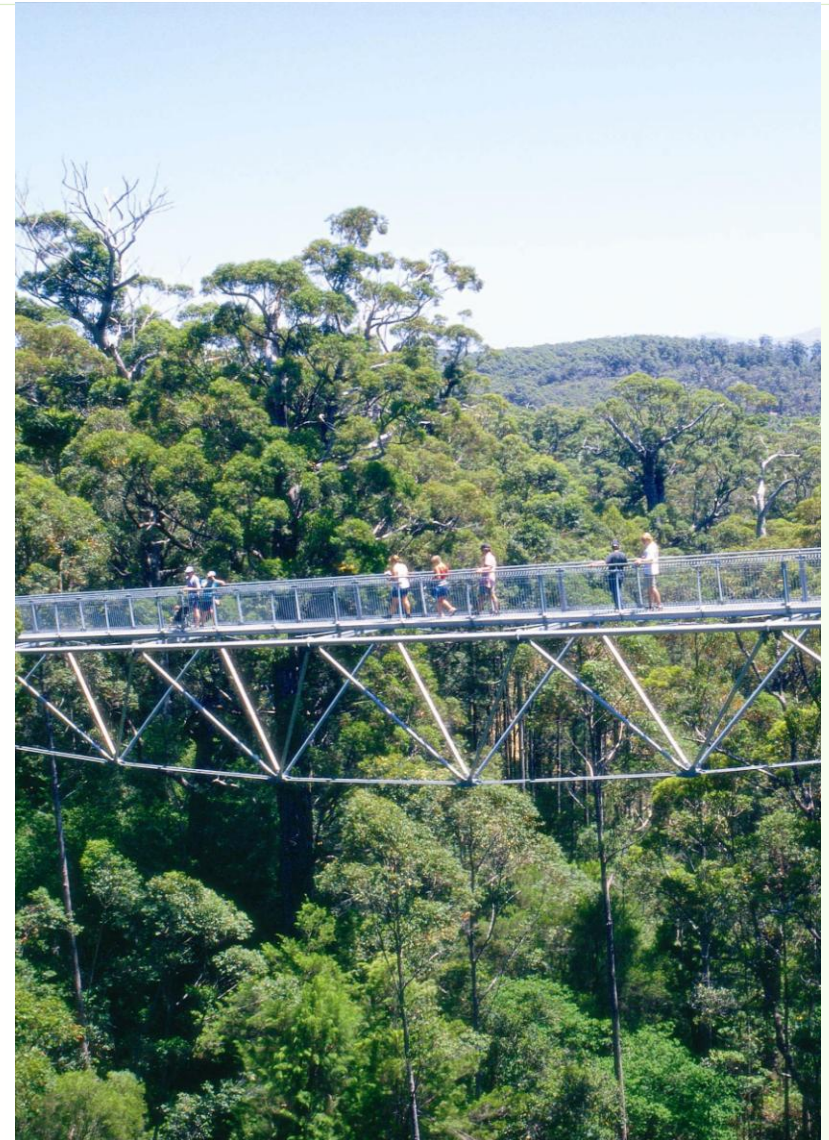
- ✓ Mining sector recognises the need for resource use efficiency.
- ✓ Up to 30% of water on mine sites is recycled.
- ✗ Land disturbance increasing.
- ✗ Energy use increasing.
- ✗ Greenhouse gas emissions increasing.



TOWARDS SUSTAINABILITY – tourism

Managing visitors:

- ✓ Sustainability is starting to be incorporated into tourism.
- ✓ 42% of tourists visit natural icons.
- ✗ 1% of tourism businesses have environmental accreditation.



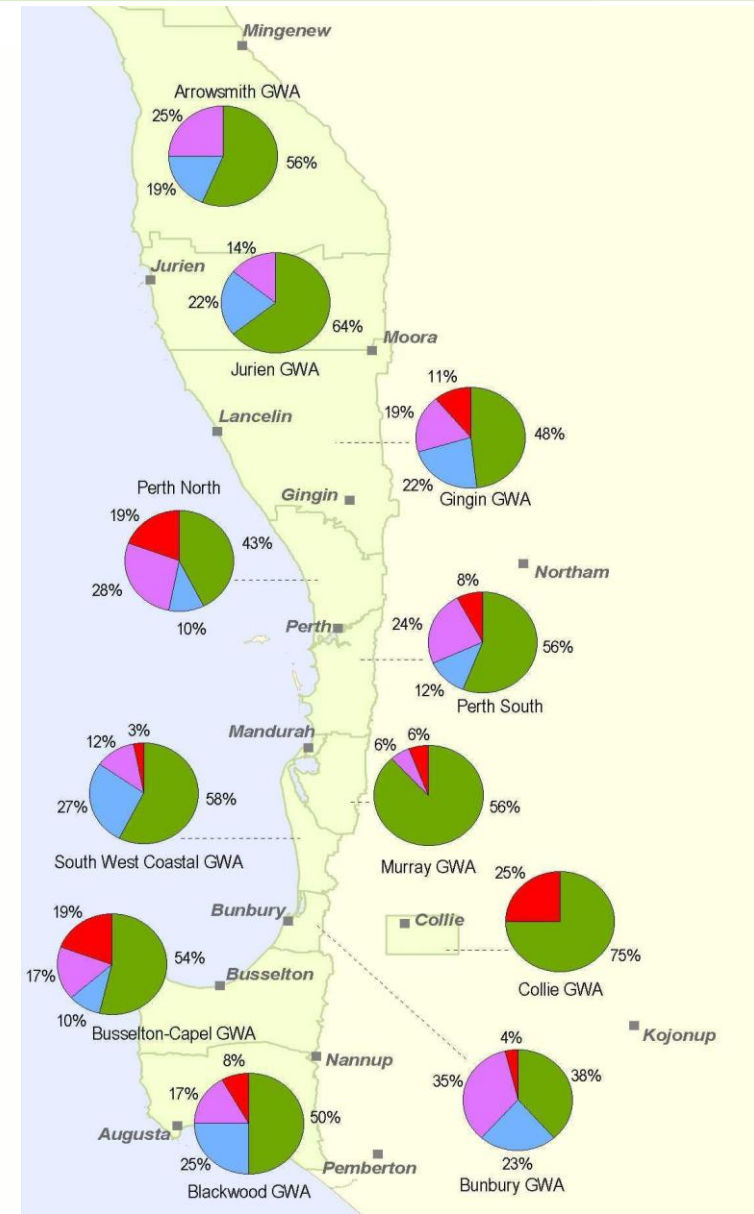
TOWARDS SUSTAINABILITY – water supply

Managing water supplies:

- Providing drinking water from natural sources.

× 25% of groundwater and surface water allocations are approaching or exceeding their limits.

✓ Perth household water use efficiency is improving.

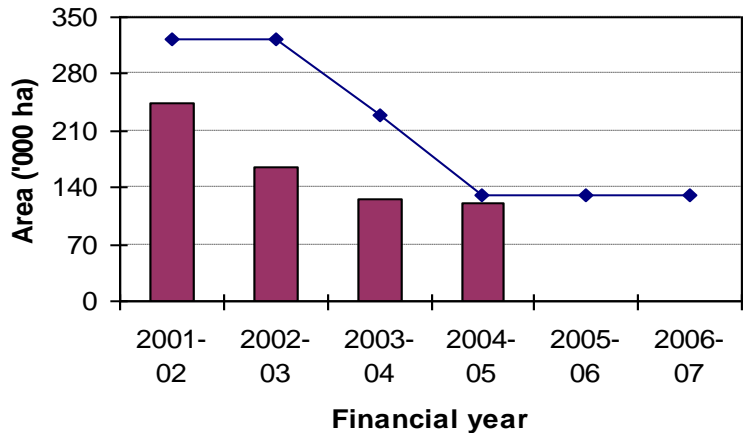


TOWARDS SUSTAINABILITY – wood production

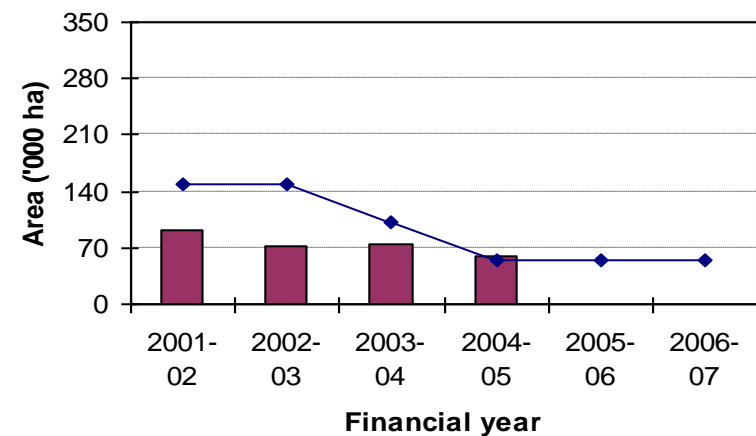
Using forests :

- 38% of South West native forest available for wood production
- ✓ Wood from plantations >> wood from native forests.

Jarrah harvesting for 2004 / 05 = 93% of limit



Karri harvesting for 2004/05 = 111% of limit



What Else Do We Need To Do?

1. Strategic land use planning –

- Peel-Harvey
- Greater Bunbury
- rest of South West

Why –

- Preserve productive farm land
- Conserve natural values, e.g. forests, wetlands
- Land scale sensitive urbanisation, e.g. regional centres, towns, villages
- Enhanced transport links



What Else Do We Need To Do? *(continued)*

2. Sustainable Housing -
 - energy and water efficiency

3. Individual Behaviours -
 - consumption
 - energy use
 - transport
 - recycling



Conclusions

1. If the present trends continue the South West will lose the very environmental features that attract people to live, work and recreate in the South West.
2. A number of industry sectors have recognised their impact on the landscape and are adopting sustainable management practices.



Conclusions *(continued)*

3. Strategic land use planning is critical if we are to provide for economic development while conserving and protecting the natural resources of the South West.
4. Individually we too have to adjust if we are to fulfil our moral obligation to make our contribution to minimising climate change risks and impacts.

