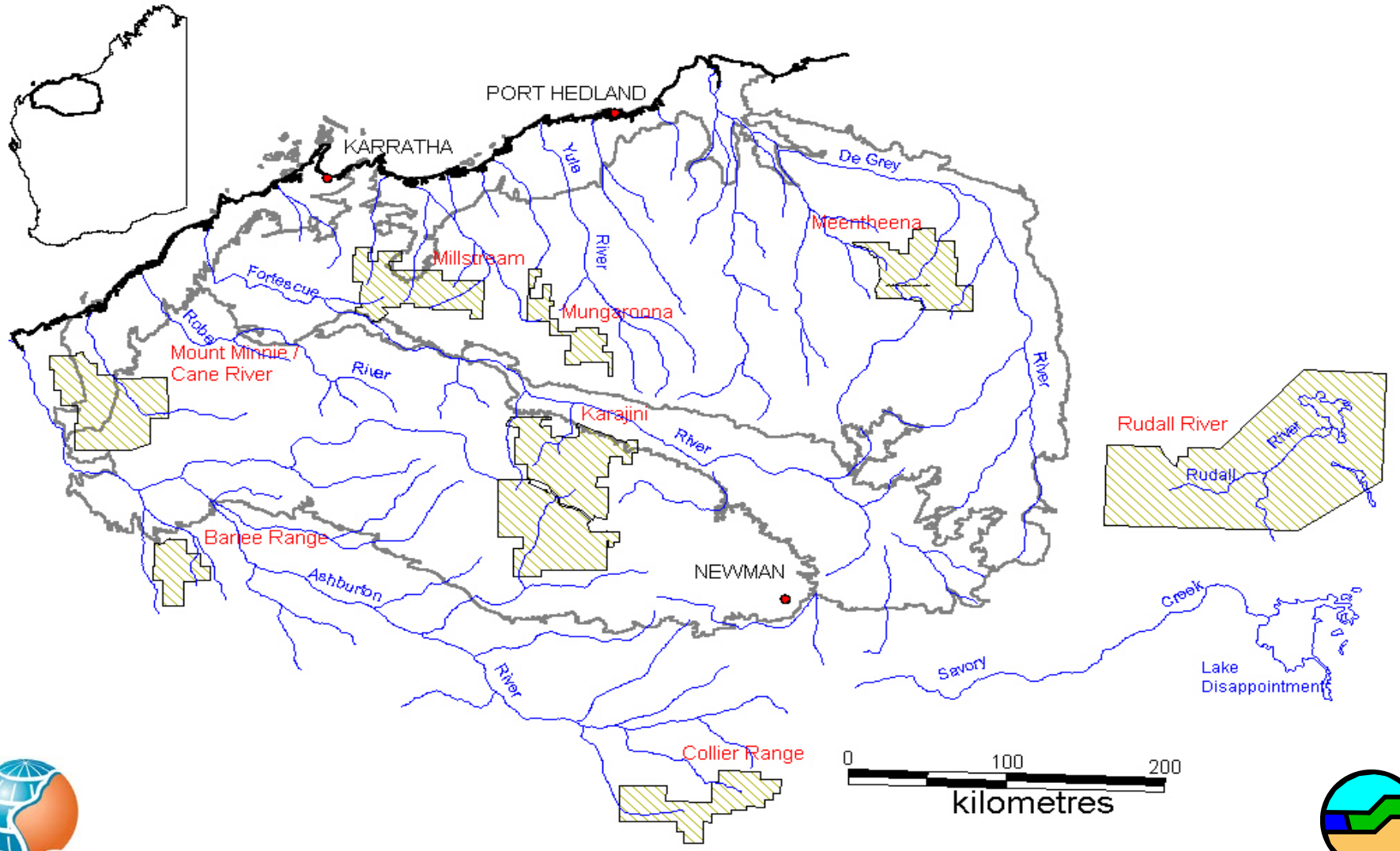
PILBARA REGION BIOLOGICAL SURVEY 2002 - 2007

Pilbara Region showing IBRA boundary



The Pilbara Region

- biodiversity has elements of northern and desert floras and faunas, as well as endemic species. A National Biodiversity Hotspot
- location of several national parks and other conservation reserves
- the effectiveness of these reserves in conserving the region's biodiversity has not been properly assessed
- however, reserves contain only 42 of the 88 regional vegetation-types

The Pilbara Region

- a priority for reservation (NRS Category 3)
- Fortescue Plains sub-region 0.8% reserved
- Roebourne sub-region 6.6% reserved
- Chichester sub-region 9.6% reserved
- Hamersley sub-region 14.1% reserved
- 3 of the 4 sub-regions were assessed at environmental health class 3 to 4 (i.e. typical of pastoral regions where significant degrading processes are occurring)

The Pilbara Region

- Has valuable mineral and energy resources, especially iron ore and hydrocarbons
- Produces a major proportion of Australia's export income
- Has a pastoral industry that has existed for > 100 years
- Has a significant tourism industry

Stygofauna

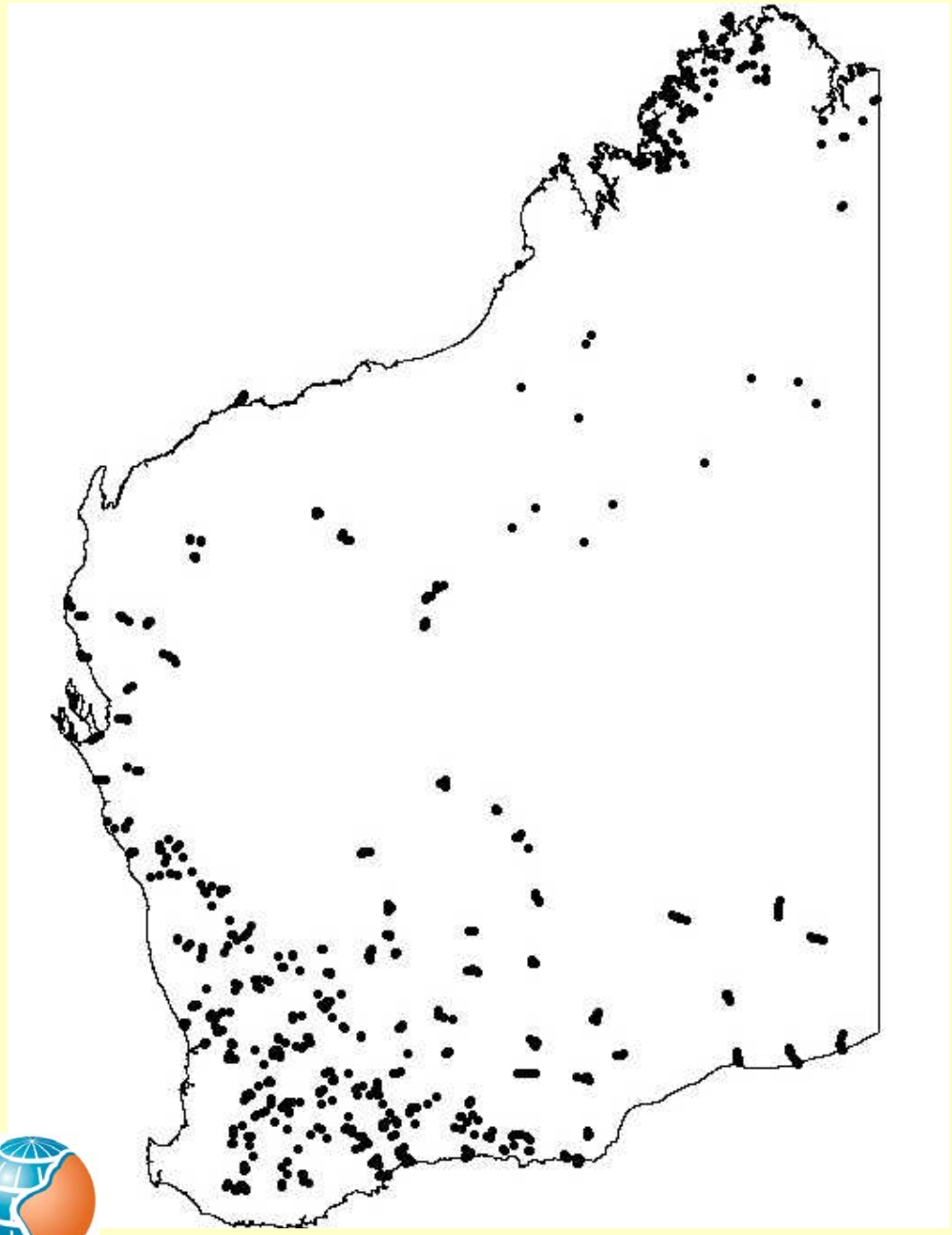
- has considerable conservation importance and a high degree of local endemism
- is very poorly known, with insufficient information to begin planning its conservation
- de-watering for mining and groundwater abstraction for water supply are potentially threatening processes
- insufficient regional data make impact assessment difficult

Overall state of biodiversity knowledge

- new species of terrestrial plants and vertebrates, as well as large numbers of terrestrial and aquatic invertebrates, are still being discovered in the Pilbara
- the regional pattern of biodiversity is not understood

The Department (often with the assistance of the WA Museum) has a long-standing commitment to undertaking regional biogeographic surveys of the State

Many have been partly funded by the Commonwealth



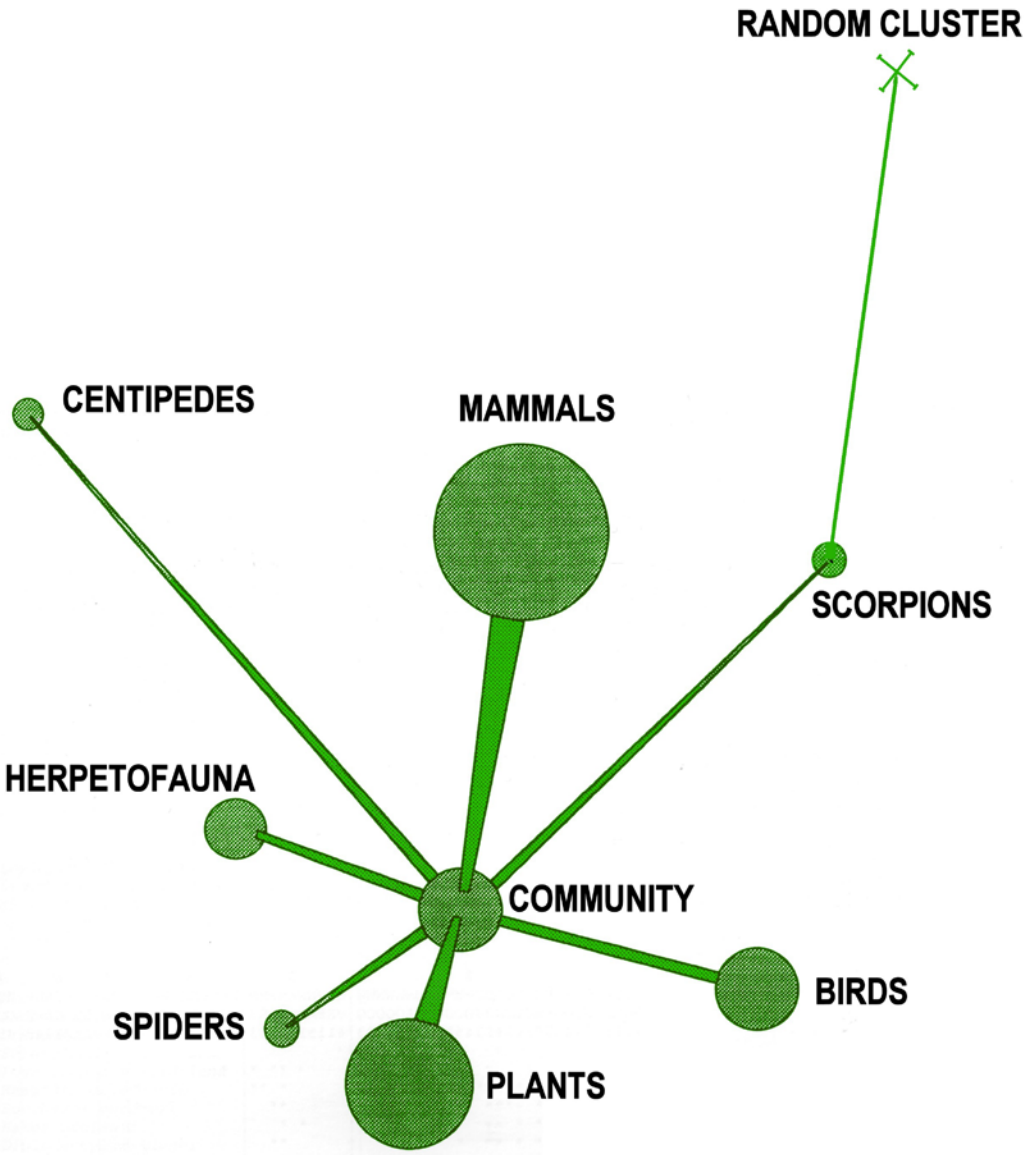
Site-based regional biogeographic survey sites since 1979

A scientific approach

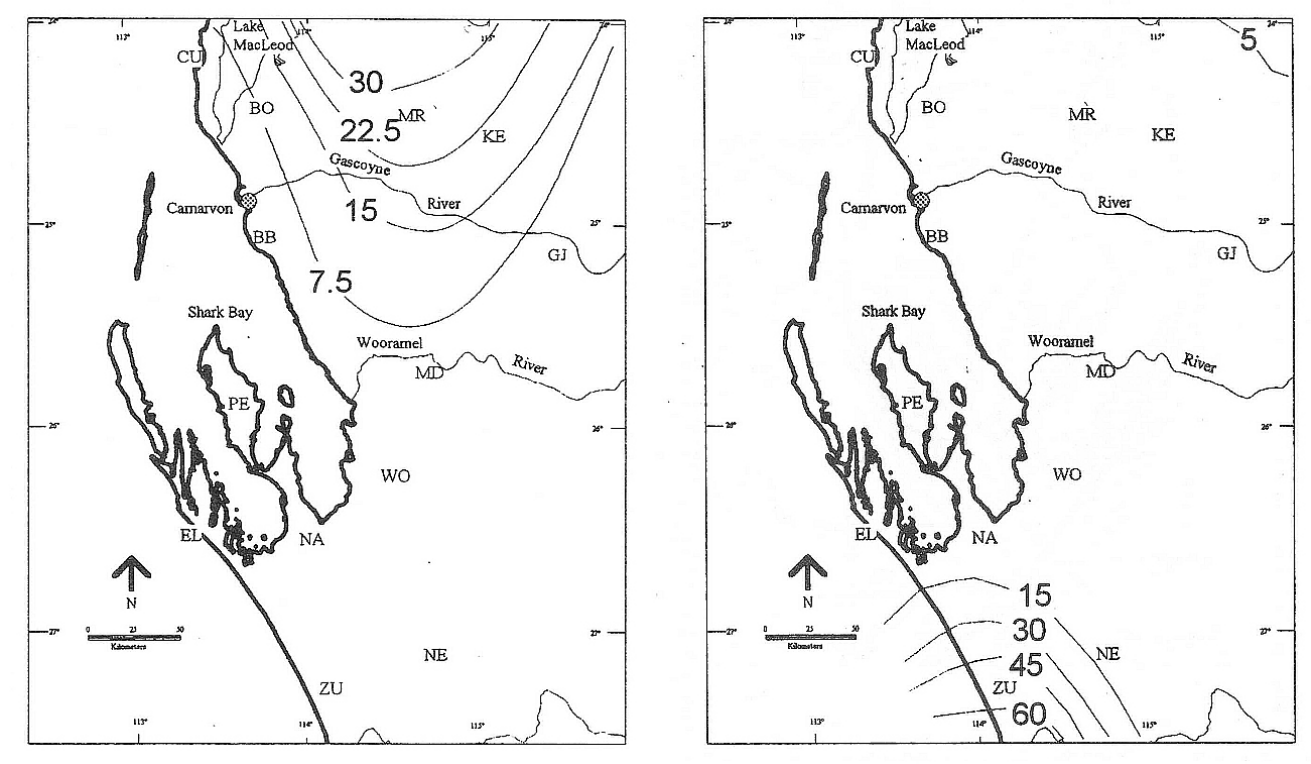
- The regional survey program is based on a rigorous, quantitative, site-based sampling strategy

- Recent surveys have revealed that plant, vertebrate and invertebrate groups need to be sampled before biodiversity models become realistic

Low Cross-taxon Congruence



Gradients in Composition



Red desert dunefield community.

R = Fn (P_{war}+T_{war} -P -K)

P < 0.001, Scaled deviance 481 → 76

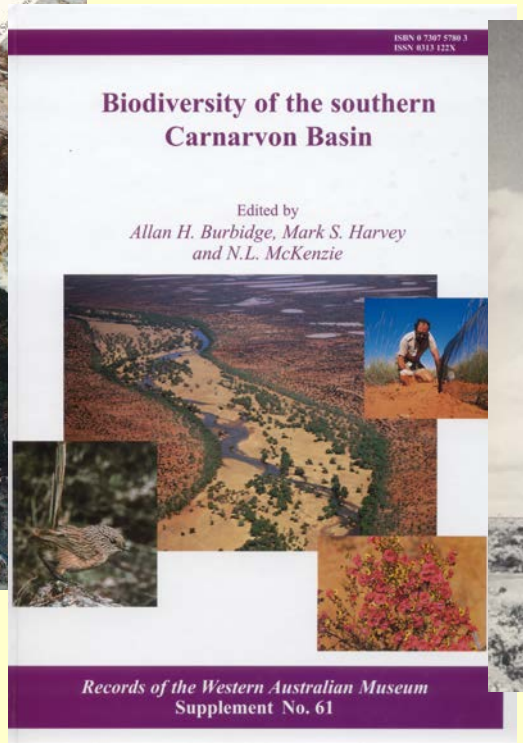
South-western sandplain community.

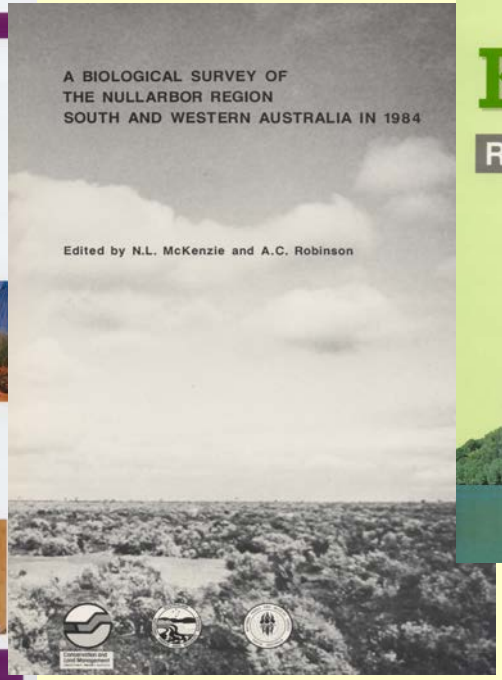
R = Fn (P_{ann}+T_{cld} +Sand +CEC)

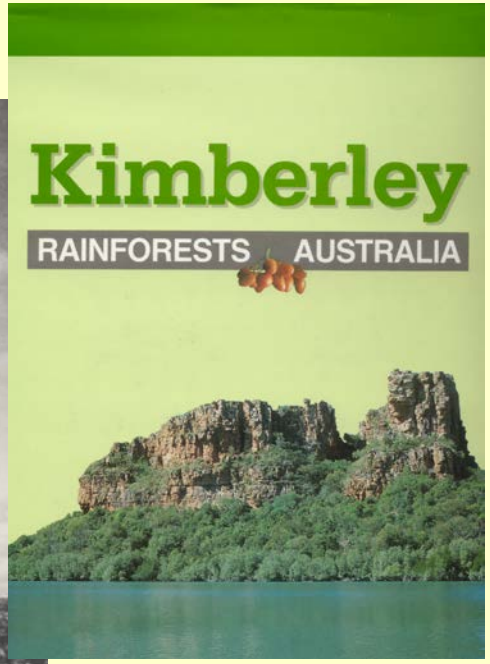
P < 0.001, Scaled deviance 824 → 55

Some publications from major surveys

The methods and results are published in refereed books and journals







Our regional biodiversity surveys provide a range of outputs

OUTPUTS (1)

Data on the distribution and conservation status of the Region's

- vascular flora (including aquatics), and
- selected components of its fauna (reptiles, frogs, small/medium mammals including bats, birds, spiders, scorpions and aquatic invertebrates including subterranean species).

OUTPUTS (2)

An improved basis for assessing the environmental impact of development proposals by:

- allowing results of localised surveys to be interpreted in a regional context, and
- providing a quantitative basis for predicting species occurrences throughout the region

OUTPUTS (3)

An appraisal of the Region's biodiversity conservation reserve system, consistent with the objectives of the National Reserve System Program

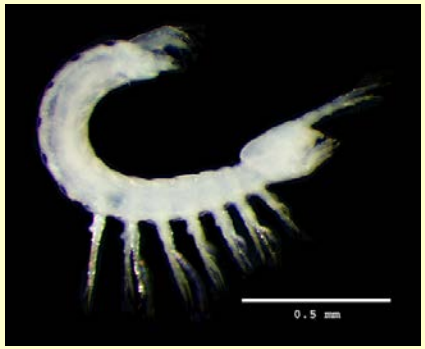
OUTPUTS (4)

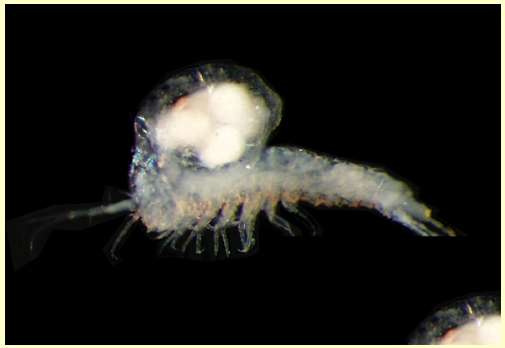
- More reliable lists of threatened species and ecological communities, as well as better information for recovery planning

OUTPUTS (5)

Information on the distribution and status of the Region's stygofauna

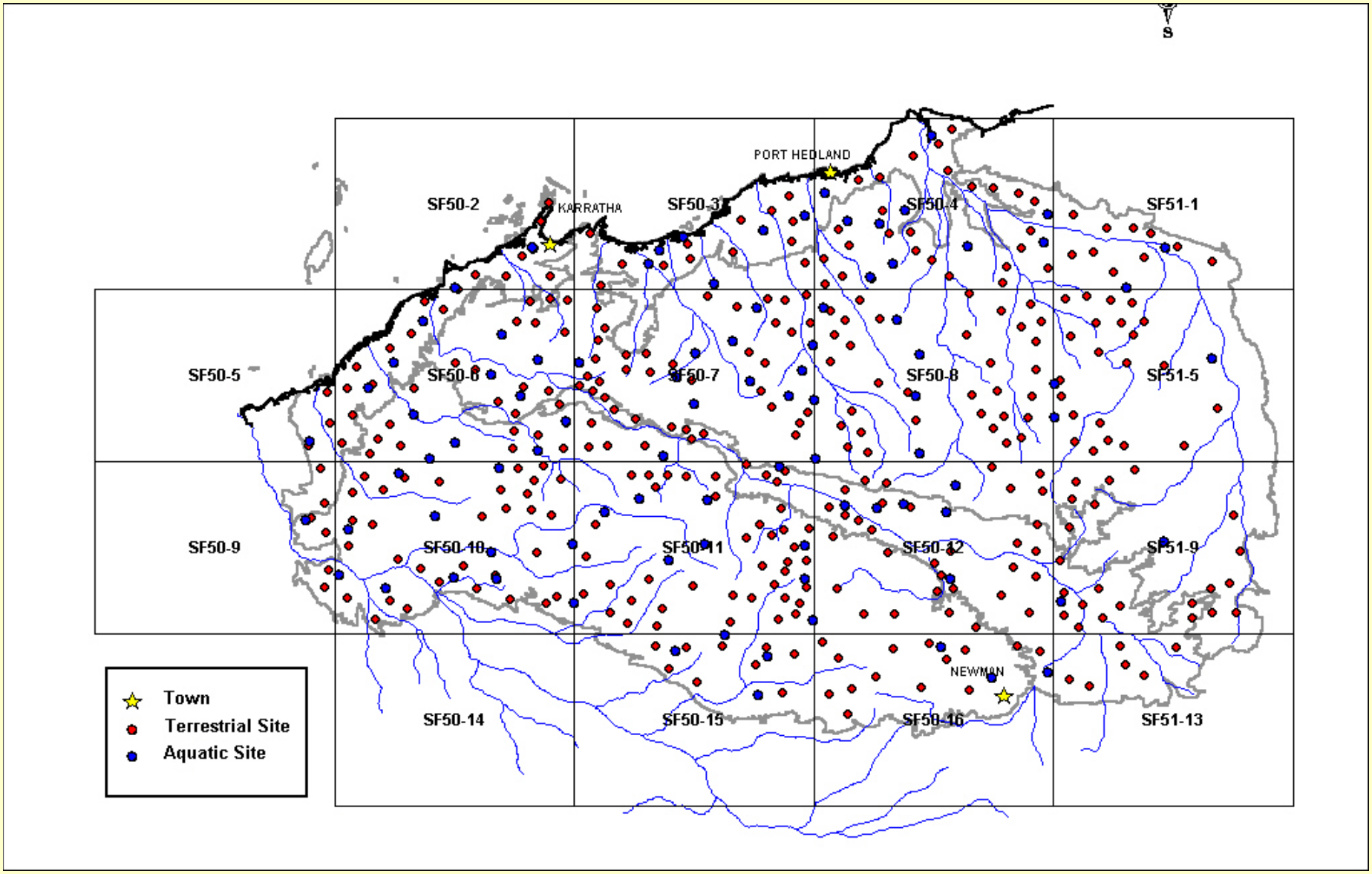
In September, 2001, in his report to the EPA, Dr Phillip Playford recommended that regional and site-specific surveys of Pilbara stygofauna were essential to resolve the current difficulties in assessing, under State and Commonwealth environment legislation, the impact of mine de-watering and/or groundwater extraction





THE PILBARA REGION BIOLOGICAL SURVEY

- Sites are stratified across each 1:250,000 map sheet to sample the major surface types and represent the geographical extent of the study area
- Number of study sites
  Terrestrial biodiversity: 300
  Sub-fossil mammals: 50
  Aquatic biodiversity: 90
  Stygofauna: 360


S
PORT HEDLAND
KARRATHA
NEWMAN
SF50-2
SF50-3
SF50-4
SF51-1
SF50-5
SF50-6
SF50-7
SF50-8
SF51-5
SF50-9
SF50-10
SF50-11
SF50-12
SF51-9
SF50-14
SF50-15
SF50-16
SF51-13
Town
Terrestrial Site
Aquatic Site

THE PILBARA REGION BIOLOGICAL SURVEY

- 22 scientific staff over 5 years
- 70 person-years effort

FUNDING

- Total cost (including overheads) over the five years is $12.5 million

- Proposed to be jointly funded by State government (CALM & WAM), Commonwealth Government (NHT2) and mining industry

Progress at October 2003

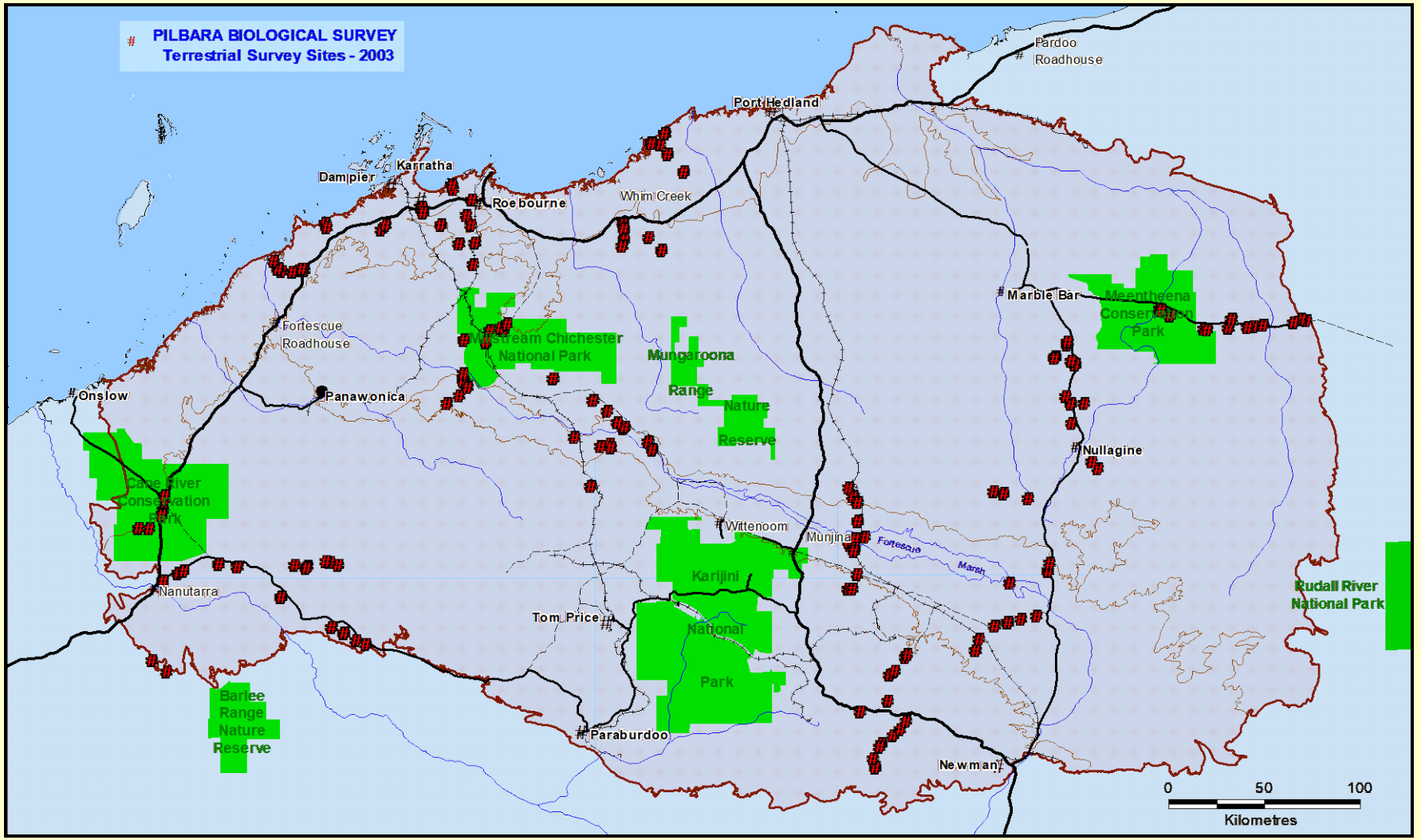
Stygofauna: 16 months into the 4 year project

- 250 bore holes sampled

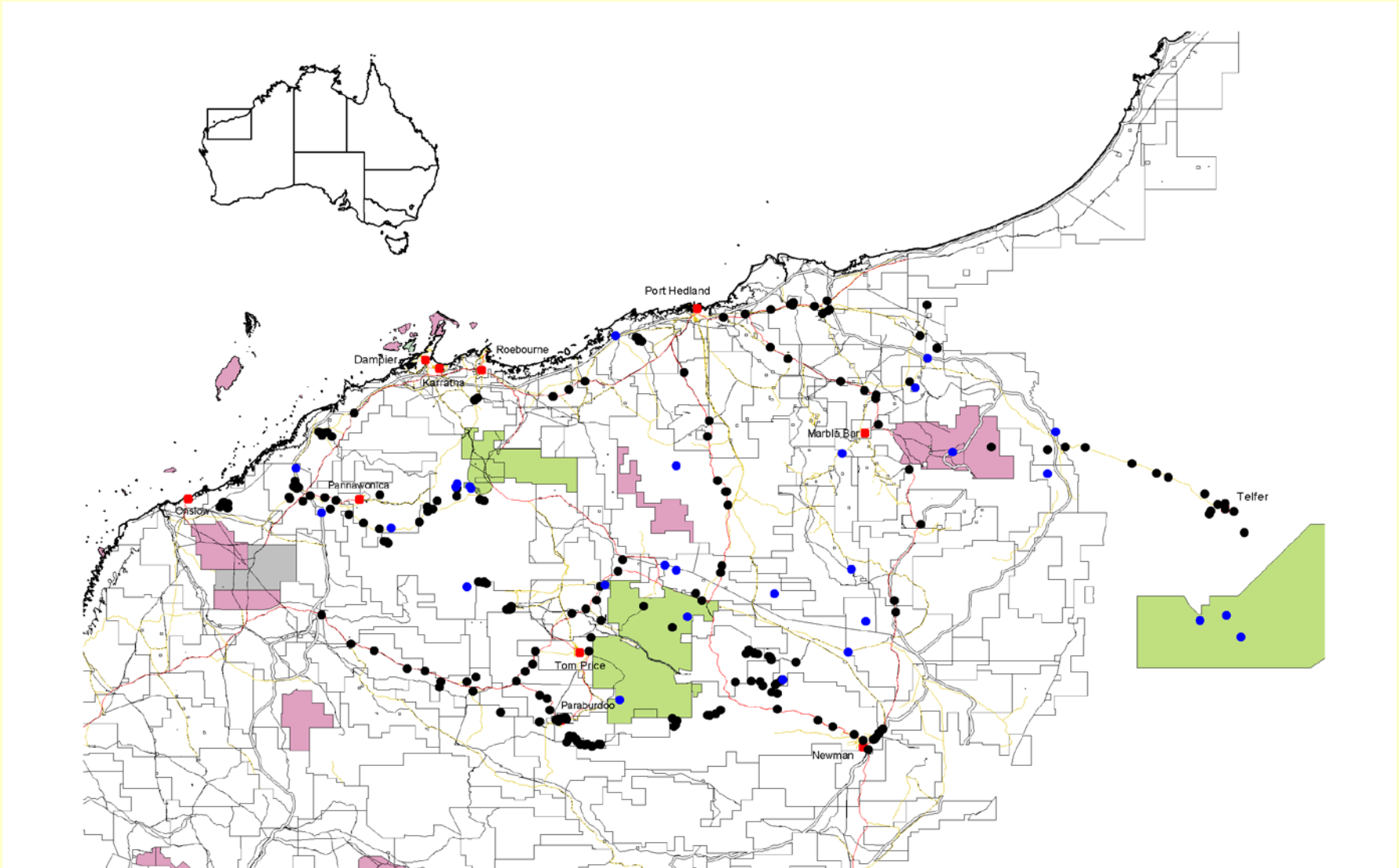
Surface Biota: 4 months into the 4 year project

- 151 land quadrats selected and installed, with invertebrate pits open
- 29 surface aquatic sites selected & sampled

Terrestrial Survey Sites Established and Running - October 2003



Stygofauna & Surface Aquatic Sites established and running - Oct 2003



OPERATING FUNDS REQUIRED (m$)

per year, for 3 years:

0.8 CALM 0.3 Industry 0.8 C/W

(including this year)

4th year:

0.2 CALM, 0.1 Industry, 0.2 C/W

SUMMARY

- Pilbara Region Biological Survey to run from 2002 to 2007
- To be carried out by Department of Conservation and Land Management with assistance from WA Museum
- Funding sought from State, Commonwealth and industry
- Survey will provide a range of outputs useful for biodiversity conservation planning and environmental impact assessment