Suffering the slings and arrows of outrageous unpredictability

Aquatic invertebrates of WA's arid regions

Adrian Pinder

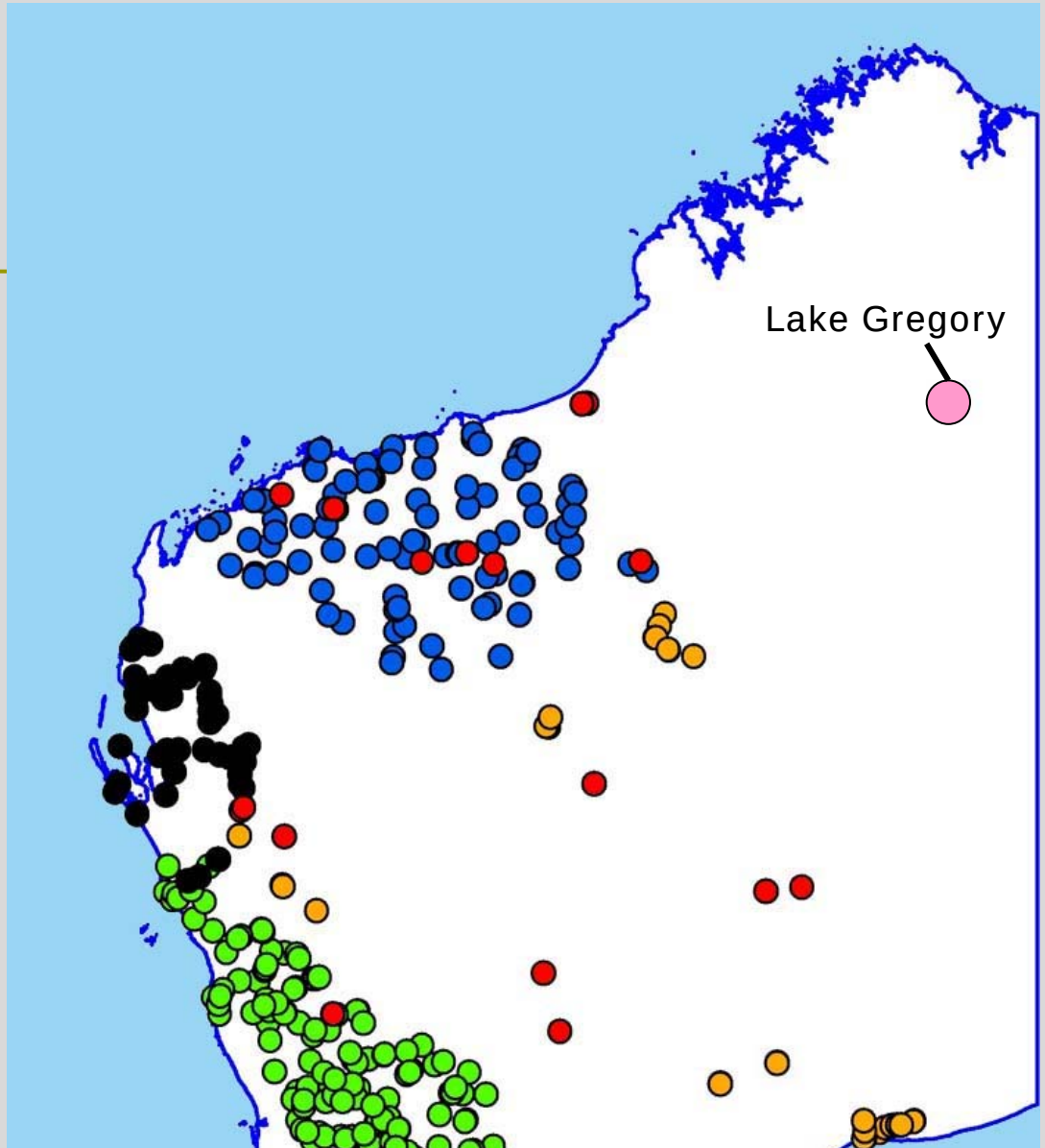
Department of Environment and Conservation

verview

- Diversity of arid zone wetlands and aquatic invertebrates in WA
- Biogeography
- Environmental drivers of invertebrate communities in arid zones
- Threats

C datasets

rnarvon Basin Survey
ake Gregory
heatbelt Survey
bara Survey
land Aquatic Integrity
WA surveys



rid Zone Invertebrate Diversity

~1000 species from 100 wetlands identified
luring recent Pilbara survey

~ 500 species from 53 wetlands in Carnarvon
Basin survey

~ 1300 both surveys

~ 2000 across arid WA

rid zone wetlands

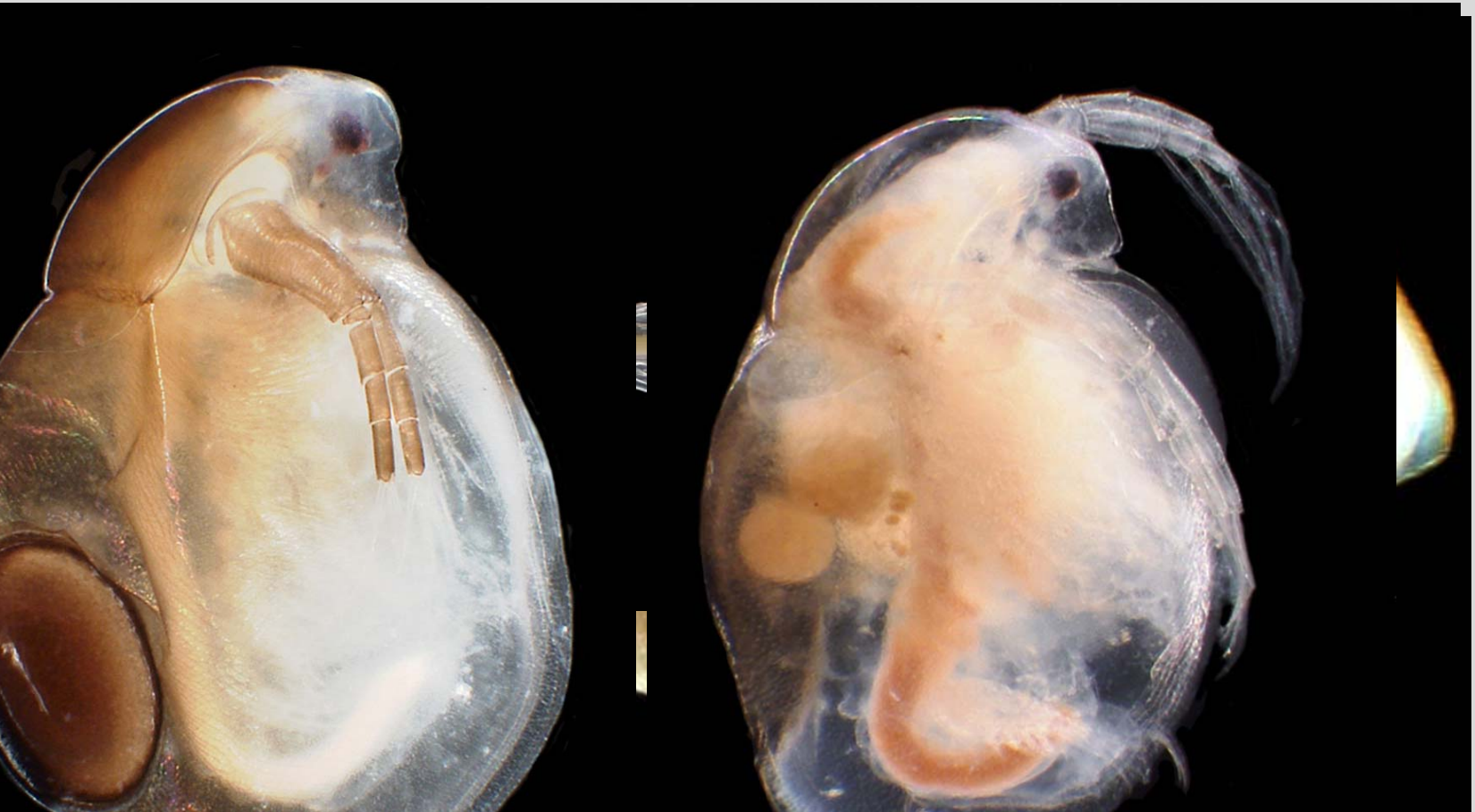
- Saline wetlands - playas/coastal lagoons/salt marshes
- Freshwater lakes
- Salt marshes
- Freshwater claypans
- Rock pools
- Springs
- Rivers and river pools

rid zone wetlands

Saline wetlands

rid zone wetlands

Salt lake invertebrates



rid zone wetlands

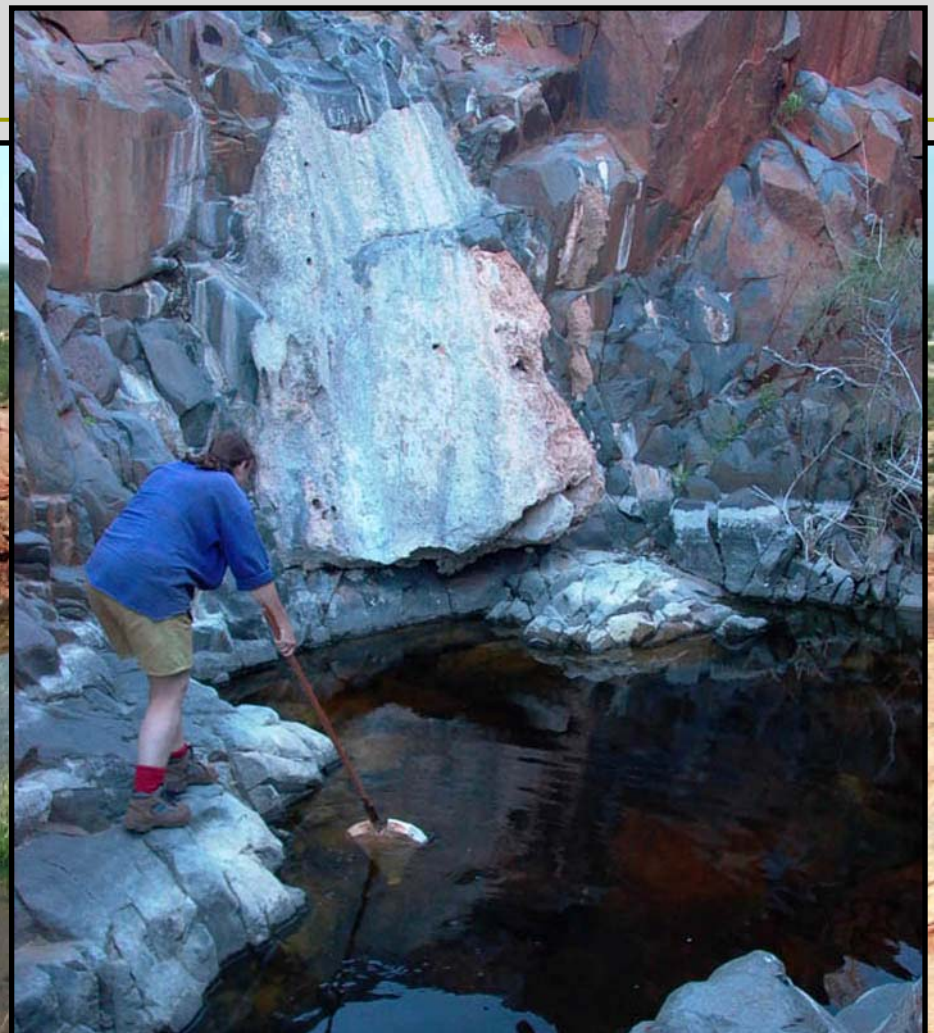
Freshwater claypans

rid zone wetlands

Claypan invertebrates

rid zone wetlands

Rock pools



rid zone wetlands

Rock pool invertebrates

rid zone wetlands

Springs

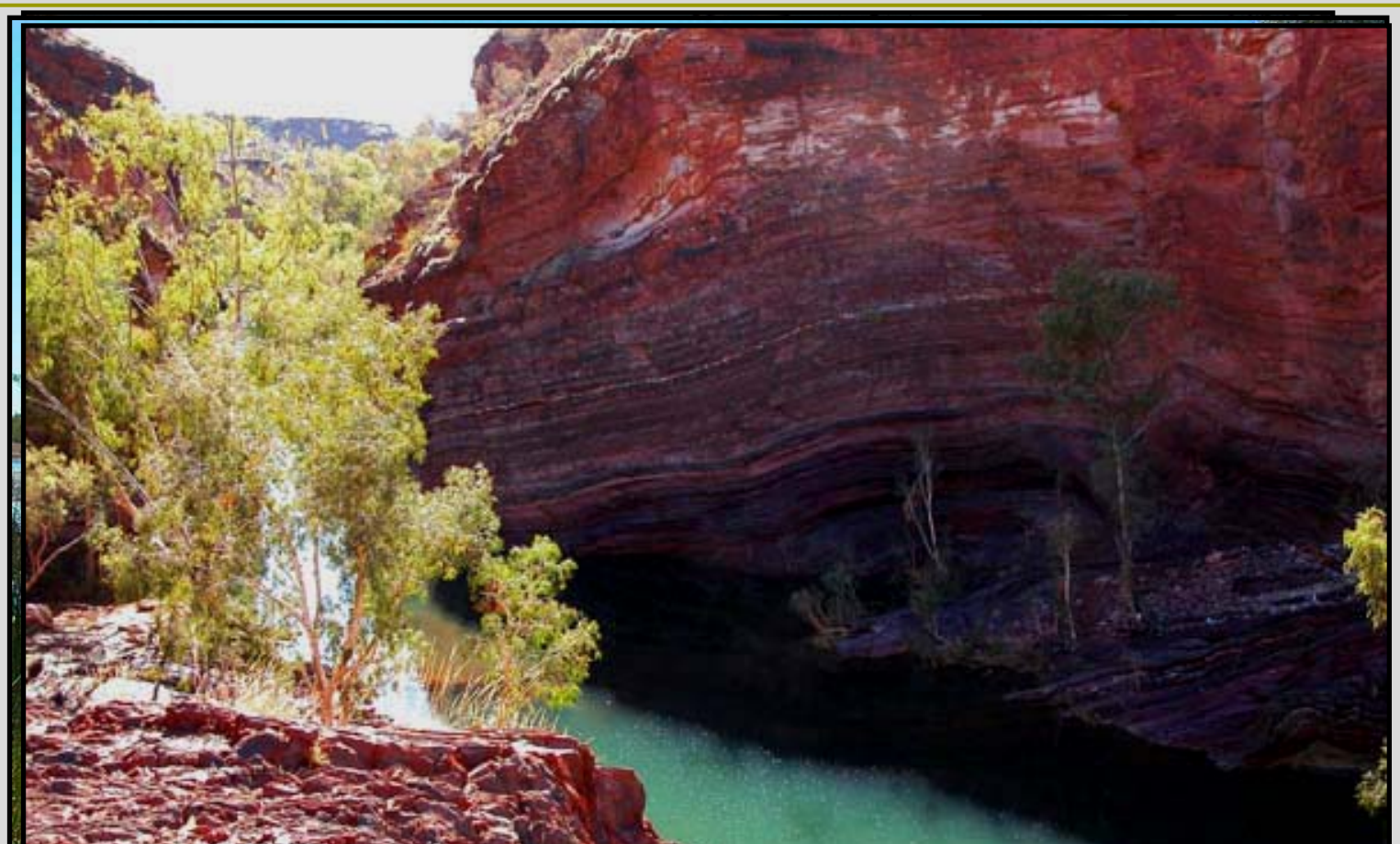
rid zone wetlands

Spring invertebrates

lbarophreatoicus platy

rid zone wetlands

Riverine wetlands



ogeography

rong biogeographic patterns across WA's arid zones

me of this associated with uneven distribution of tland habitats

rresian element prominent in Pilbara, declines through d-west (large tropical fauna restricted to Kimberley in A)

ssian/south-western fauna extends inland and north

emaean fauna of strongly arid adapted species

ogeography

Pilbara fauna

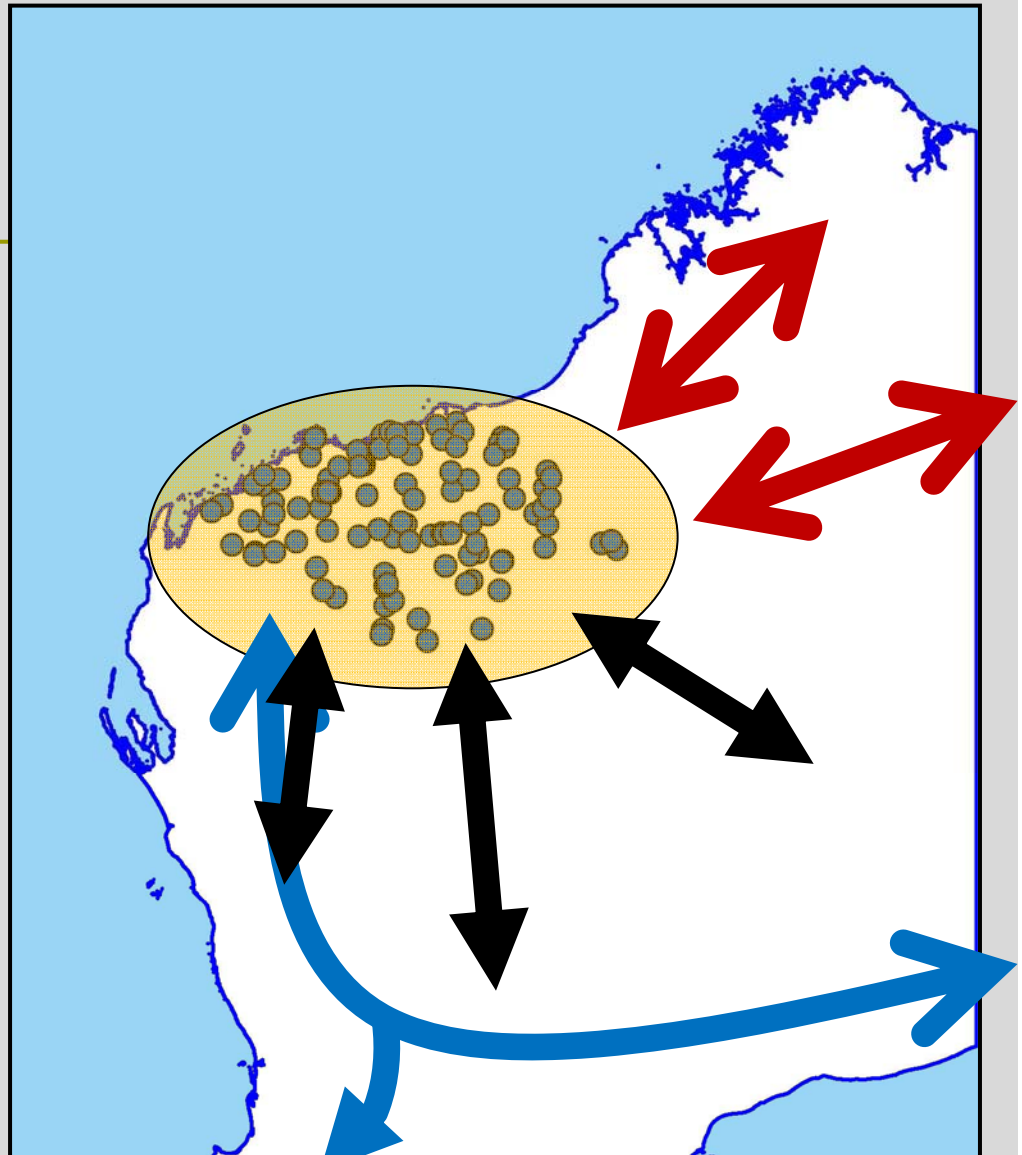
poorly known taxa

continental or patchy distributions

northern Australian

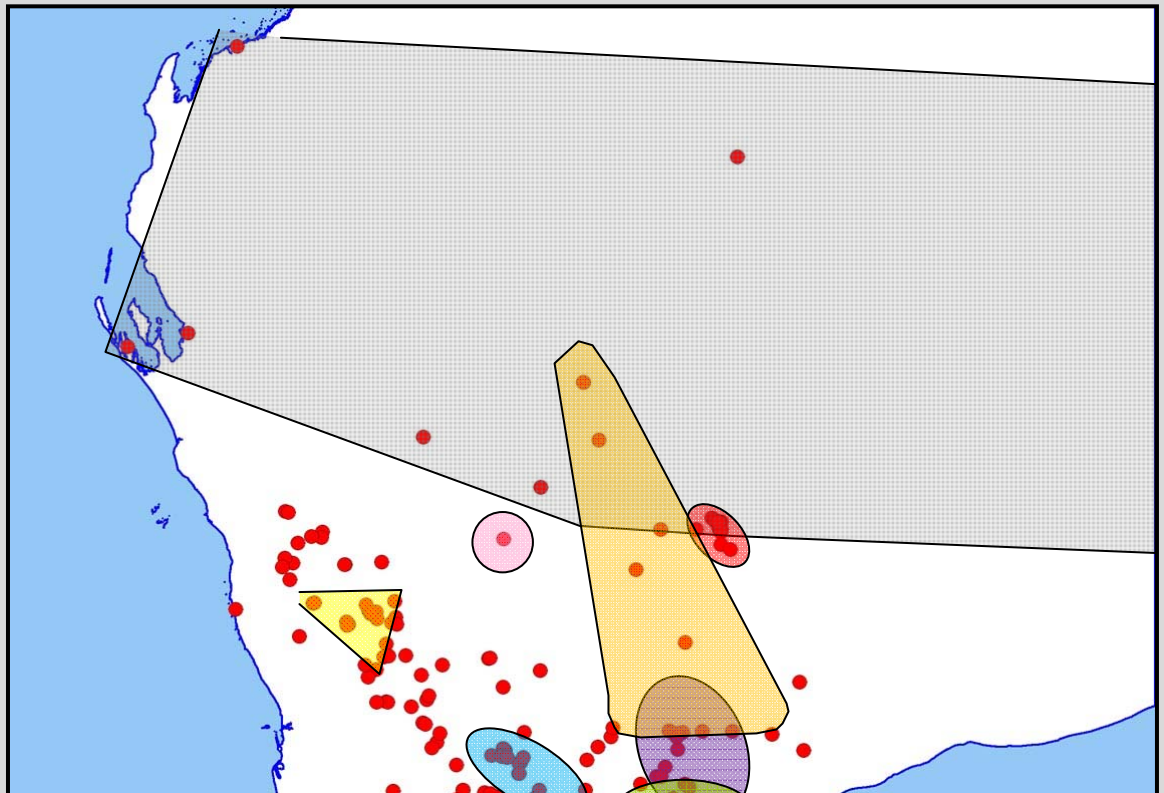
north-western?

broadly southern Australian



ogeography

arartemia (brine shrimp)



f 19 species in

ndemic)

a from Timms
/. 2009
servation
ence WA

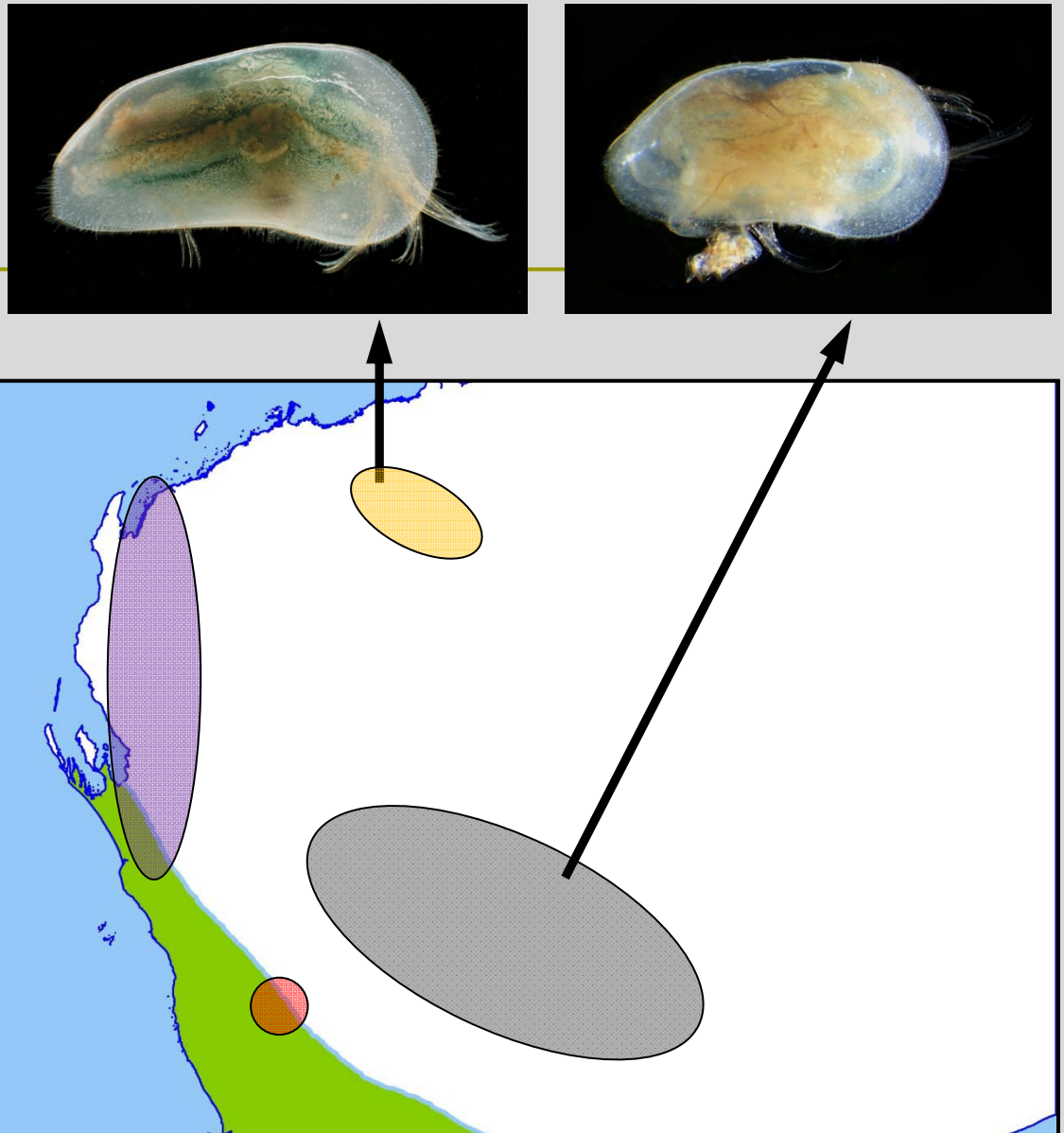
ogeography

ant ' ostracods

m in length
halophilic

f 21 spp in WA
ndemic)

a from Halse
McRae



vironmental drivers

nvironmental drivers of aquatic invertebrate mmunities in arid zones generally known, but not well derstood.

ater chemistry – salinity, turbidity, ionic composition, H, nutrients …

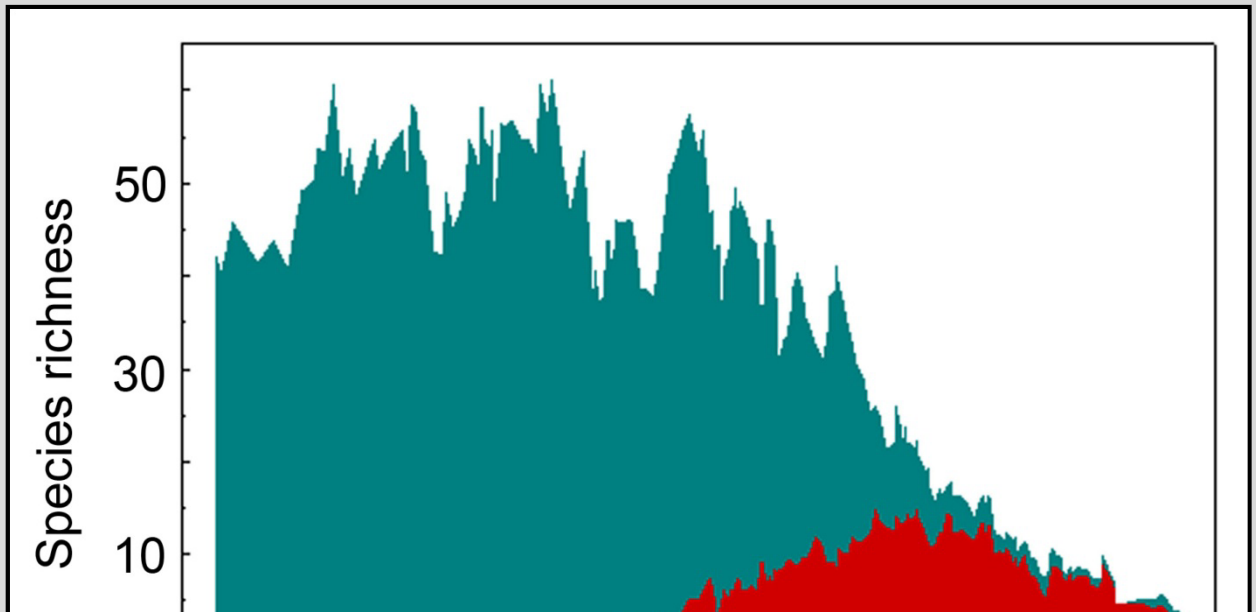
ydrology – extent of filling or flows, duration, timing, equency, predictability, connectivity

eomorphology/habitats – basin/channel shape, ediments, aquatic plants, carbon sources

vironmental drivers

alinity – known to be a very strong influence on fauna,
rimarily at salinities below sea-water (~35 g/L) or over
road ranges of salinity

er *et al.*
4
robiologia

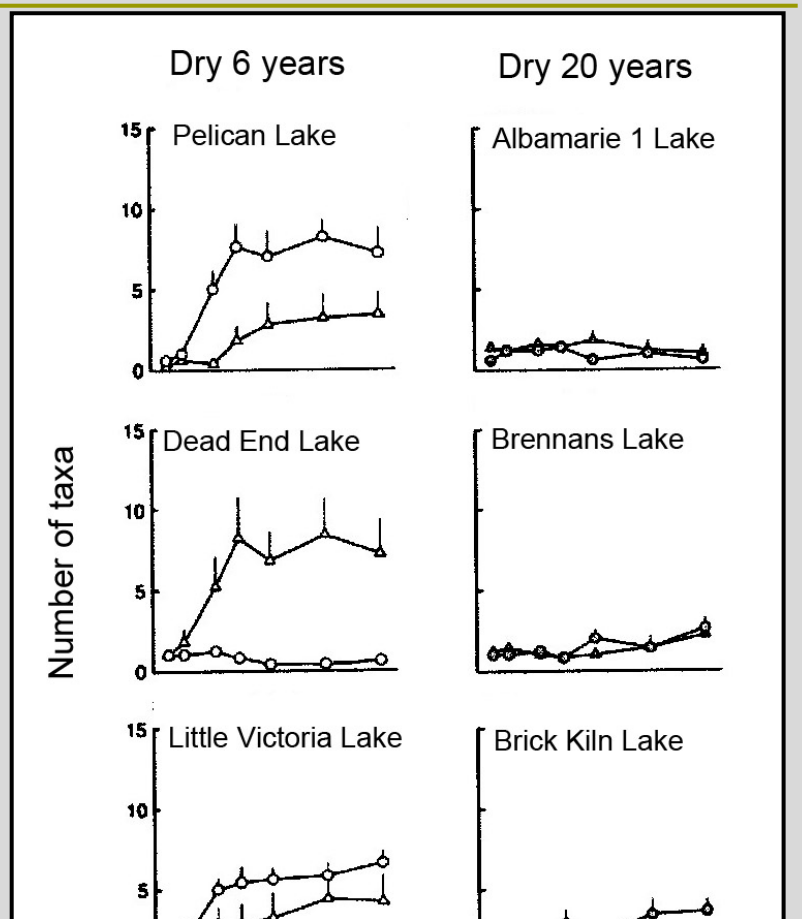


vironmental drivers

lydrology

ct of drought on
lity of resting eggs in
ment

kins & Boulton 2007
ppl. Ecol 44: 823-832



reats to arid zone wetlands

eral animals and livestock

Veeds

limate change

Vater resource development – private and public

Mining - surface water diversions and altered runoff
- disposal of excess water from mine dewatering
- contamination, destruction, excavation

ourism/recreation

reats to arid zone wetlands

Ferals and stock

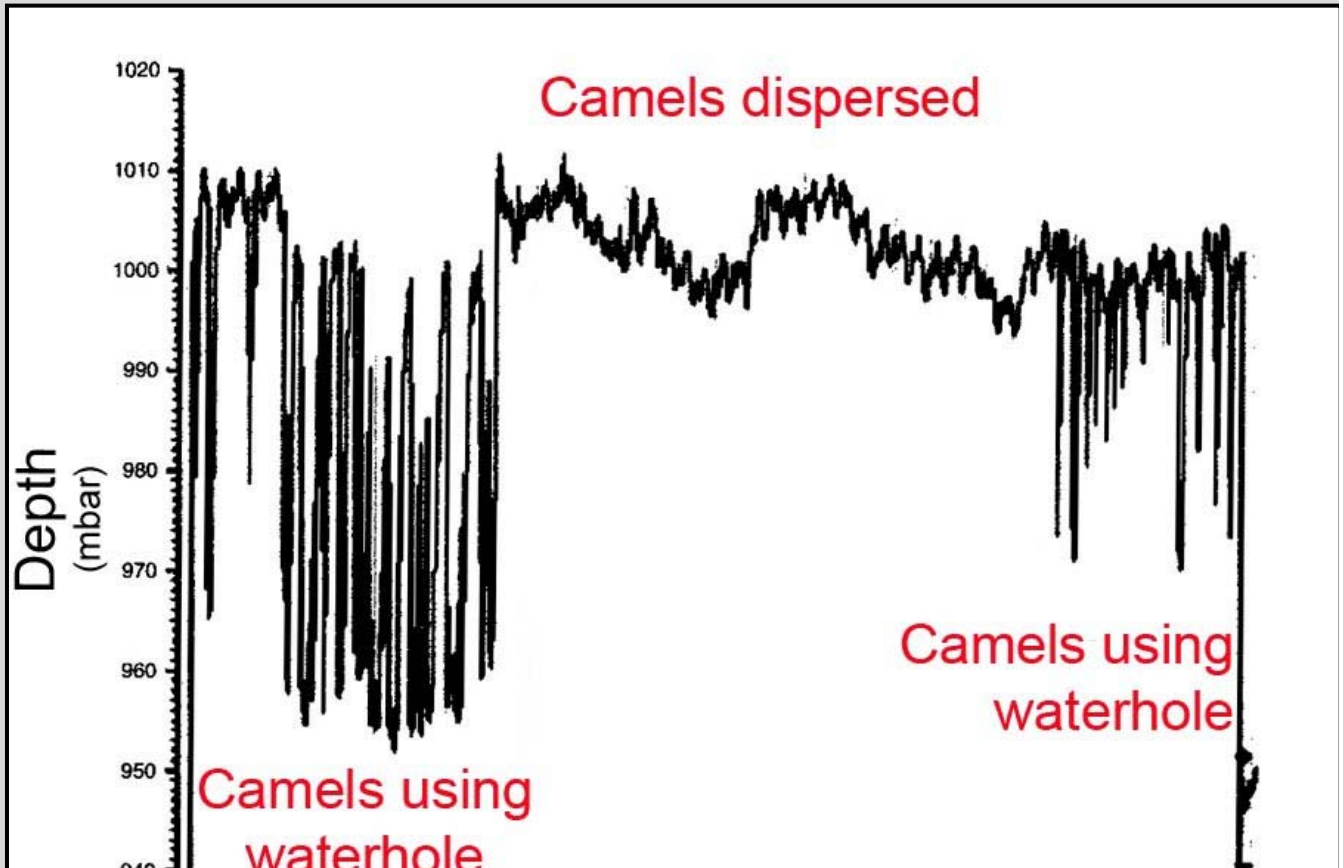
reats to arid zone wetlands

Ferals and stock

cts of
ls on a
anent
g in central
ralia

-Box *et al.*
7

Rangeland
nal



me knowledge gaps

Sparse data on invertebrate diversity for the Murchison-Gascoyne, Goldfields and deserts

Taxonomic impediments

Poor understanding of the temporal patterns in invertebrate communities in WA arid zones, particularly in relation to hydrology.

Effects of threatening processes such as feral