


Can metapopulation theory explain the distribution of an aestivating fish in seasonal wetlands?

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<http://www.chs.ecu.edu.au/MWER/>


Introduction - Background

Black-stripe minnow
Galaxiella nigrostriata

- Small endemic fish
- Shallow seasonal wetlands
- Aestivating species
- ~1 year lifespan



Allen 2004



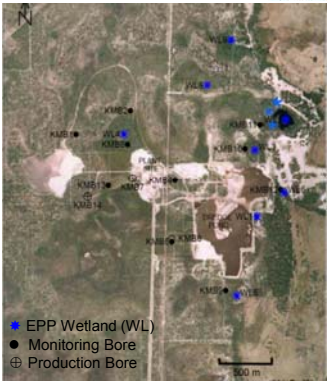
<20% of the wetlands found in the 1800s remain on Swan Coastal Plain

Introduction – Threats and Sites

Threats:

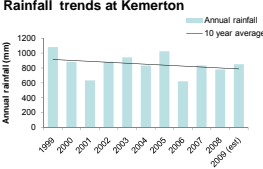
- Potential future mining activities at Kemerton
- Declining rainfall forecast in SW

(Watterson et al. 2007)




Adapted from GHD 2008

Rainfall trends at Kemerton



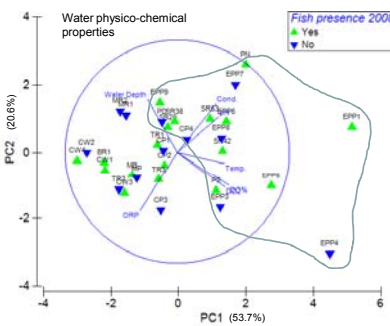
Methods – Abundance & Dist'n

- Fish - scoop-net 10m transects
- Crayfish - opera house traps
- Water quality samples
- Qualitative wetland observations



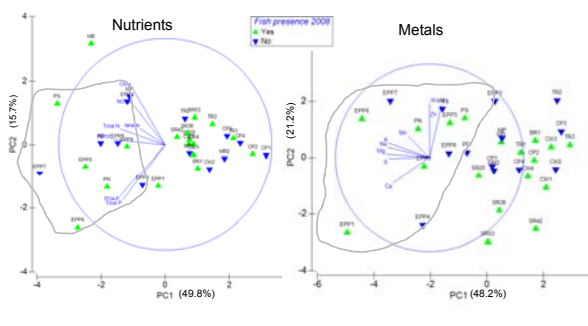
Results - Fish Distribution in 2008

| Wetland | Fish | Cray fish |
|-------------------|---------|-------------|
| EPP1 | Present | None caught |
| EPP3 | Present | None caught |
| EPP4 | Present | None caught |
| EPP5 | Present | None caught |
| EPP6 | Present | None caught |
| EPP7 | Present | None caught |
| EPP8 | Present | None caught |
| EPP9 | Present | None caught |
| Paperbark New | Present | None caught |
| Paperbark Shallow | Present | None caught |
| Paperbark Deep | Present | None caught |

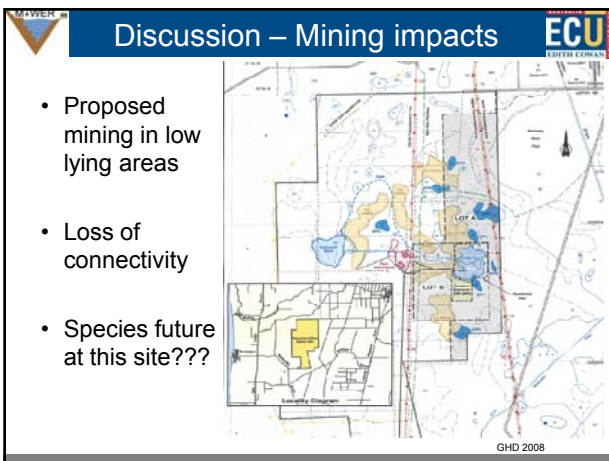
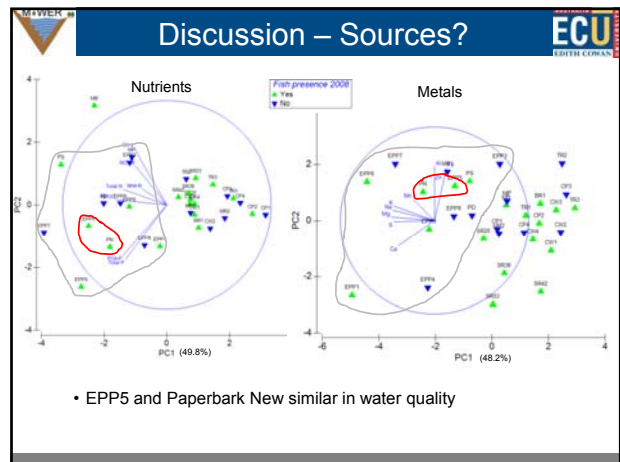
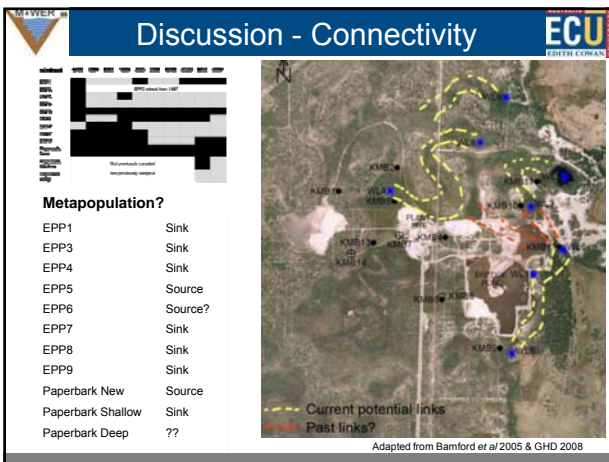
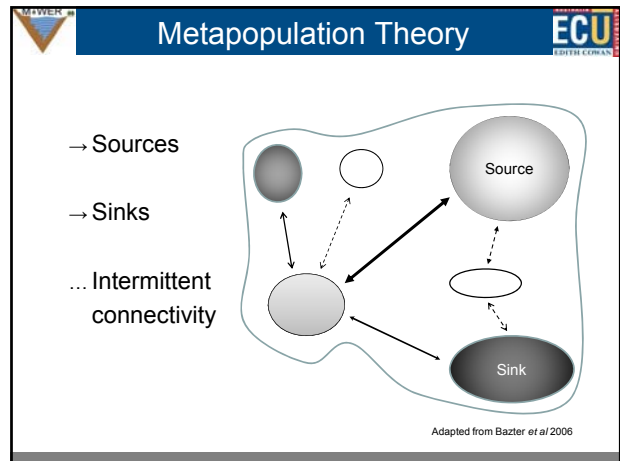
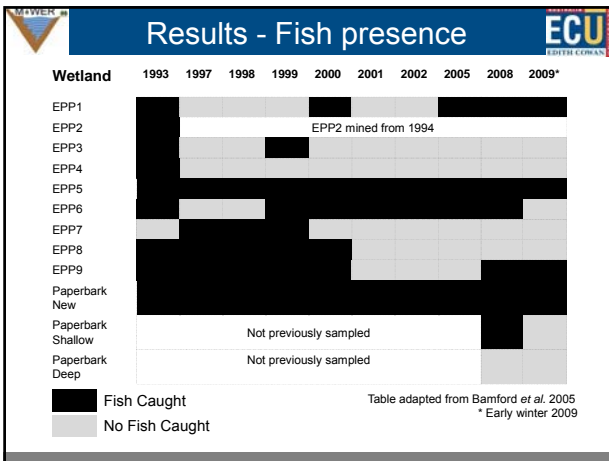


No correlation between fish distribution and water quality
 > Physico-chemical properties
 > Ordinations by PRIMER 6

Results – Water Quality




No correlation between fish distribution and water quality
 > Either nutrients or metals



Further research...

- Aestivation requirements
 - Hydroperiods
 - Soil characteristics
 - Crayfish burrows?
- Genetic diversity
 - Between wetlands
 - mtDNA or microsatellites



Conclusions

- Wetland condition/water quality does not necessarily explain fish distribution
- Need to maintain/provide connectivity between wetlands
- Metapopulation theory can explain distribution of a fish in seasonal wetland complex



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