

Does size matter for spring bugs?

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Introduction

Great Artesian Basin springs offer a consistent source of water (a refuge) for unique biota.



They also attract other users (e.g. humans, feral pigs, pest fish, cane toads and weeds), which are a threat to the native spring fauna and flora. Two threats are groundwater use, which can reduce spring discharge, and pest fish (*Gambusia holbrooki*), which can feed upon and out-compete spring biota.

To manage the threat from groundwater use, spring extent is mapped and compared over time using the distribution of permanent wetland vegetation. Mapping extent is based on the premise that a larger wetted area provides more habitat and supports higher biodiversity. This may not hold for diversity of spring fauna.



Questions

Does spring extent relate to spring macroinvertebrate diversity? Does spring extent relate to the presence of *G. holbrooki*?

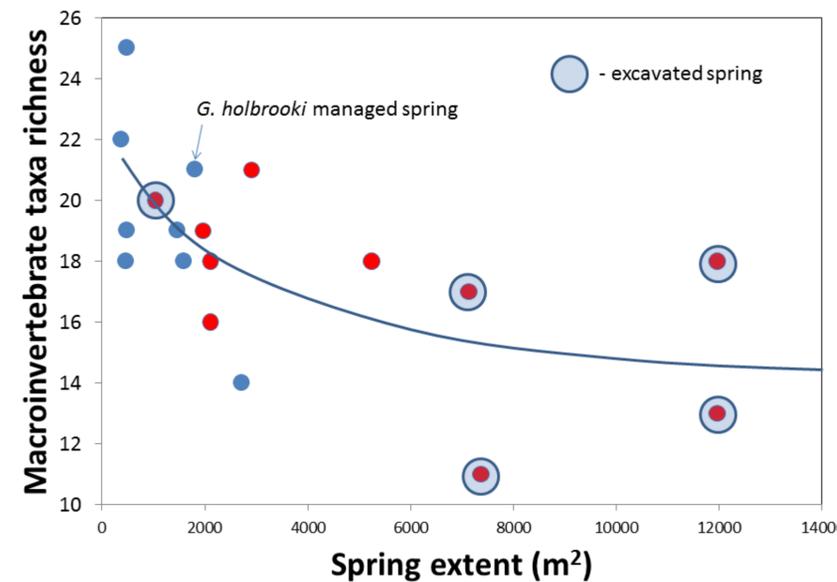
Methods

Surface extent of 18 springs was mapped at Edgbaston Reserve during July 2011. Mapping was undertaken using a GPS methodology¹. Aquatic macroinvertebrates and presence of *G. holbrooki* were recorded for each spring.

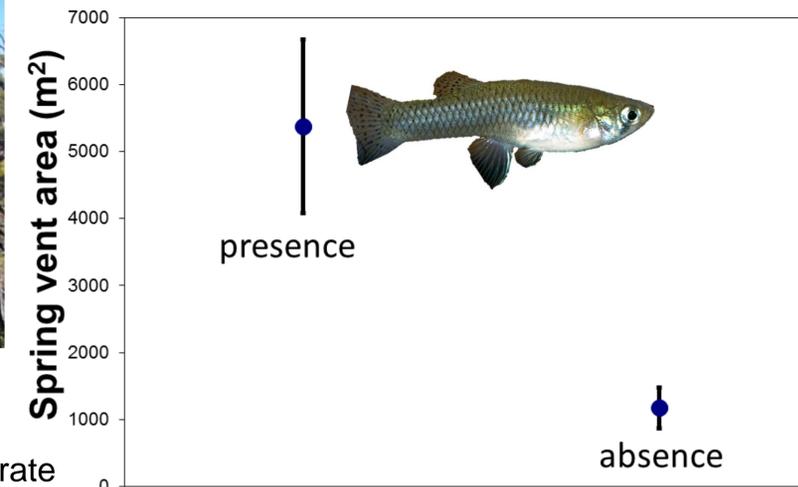


Results

- Larger springs had less macroinvertebrate diversity (less taxa richness).
- Larger springs supported *G. holbrooki*.



Relationship between spring area and macroinvertebrate diversity (Spearman's correlation $r = -0.66$; $p = 0.003$; Richness = $33.0214 - 4.4801 * \log_{10}(x)$)
red / blue – indicates springs with / without *G. holbrooki*



Mean area (with standard errors) of springs with and without *G. holbrooki* – pictured. ($p = 0.01$)

Discussion

Small springs support higher macroinvertebrate diversity. This conflicts with the premise for monitoring extent. However, it is thought that many of the larger springs sampled in this study have been previously excavated. This disturbance is likely to have helped *G. holbrooki* invade spring areas and has changed habitat characteristics such as water depth and macrophyte cover that will also impact on macroinvertebrate biodiversity.

References

- Fensham, R.J., and Fairfax, R.J. (2009) Development and trial of a spring wetland monitoring methodology in the Great Artesian Basin, Queensland. Department of Environment and Resource Management.

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