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Lake Wheatfield Waterbirds

Situated on the southern and eastern edge of the wheatbelt, Lake Wheatfield is a permanent, brackish wetland. The lake has a diverse range of fringing vegetation formations, however, these are under some stress because of increased water levels resulting from greater catchment runoff. The lake is part of the Lake Warden system and so lies within the Lake Warden Natural Diversity Recovery Catchment
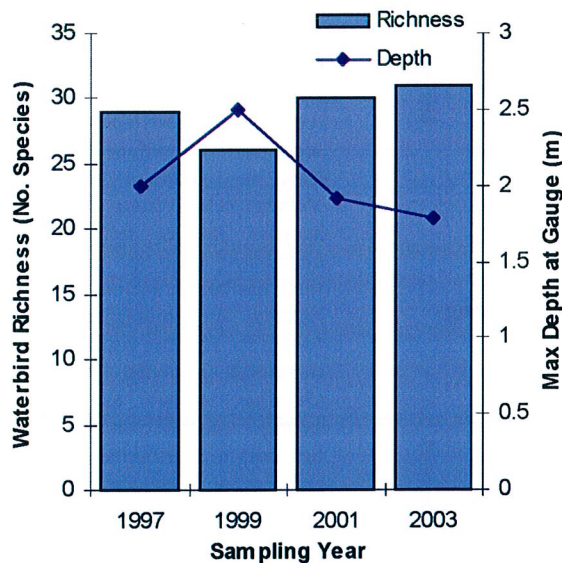

*Lake Wheatfield. (photo by S.A.Halse)*

Species Richness

At Lake Wheatfield species richness is relatively constant from year to year (mean= 29 ± Std dev. 2.16). A total of 37 species were recorded from all surveys, with most (57%) occurring in all years. In 1999 fewer species were recorded. This year saw "very much above average" rainfall for the entire eastern wheatbelt with the result that many neighbouring wetlands were filled.

While richness was constant, abundance varied widely from year to year (range approx. 1500-7000 individuals). Community composition at Lake Wheatfield remained markedly similar across years. The separation between years in the ordination is a result of the change in total and relative abundance of species, but the Wheatfield community is distinct from other wetlands being monitored.

Species richness at Lake Wheatfield
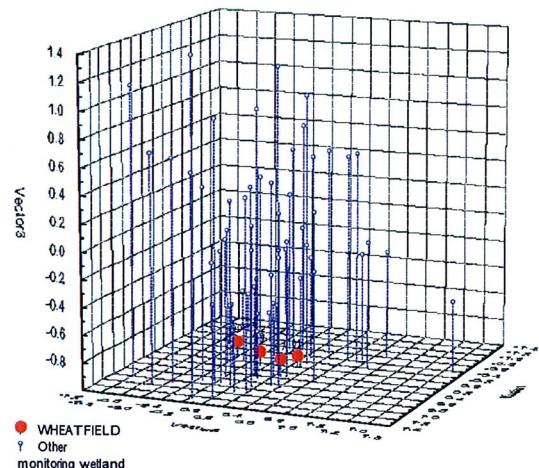
MDS Ordination (SSH) of range standardized abundance of waterbird species.

Further Reading

Cale, D.J., S.A.Halse and C.D.Walker (2004) Wetland monitoring in the Wheatbelt of Western Australia: site descriptions, waterbird, aquatic invertebrate and groundwater data. *Conservation Science W. Aust* **5**: 20-13

Halse, S.A., D.J. Cale, E.J. Jasinska and R.J. Shiel (2002) Monitoring change in aquatic invertebrate biodiversity: sample size, faunal elements and analytical methods. *Aquatic Ecology* **36**:1-16

Wheatbelt Wetlands Monitoring

The Salinity action Plan Wheatbelt Wetlands Monitoring programme commenced in 1997 with the sampling of five wetlands and was expanded to include 13 in 1998 and finally a total of 25 wetlands in 1999. These monitoring wetlands have been sampled every second year since commencement, such that half of the wetlands are sampled in alternating years. Wetlands first sampled in 1997 have now been sampled 4 times. While this actually yields few data points and interpretation is, at this stage, imprecise it is expected that as the project continues and further data points are collected an increasingly accurate estimate of wetland trends will be achieved. Faunal sampling includes; waterbird species richness and abundance, aquatic invertebrate species richness and abundance and water-chemistry. Sampling of these parameters is directed toward tracking trends in biodiversity of the wetlands individually and as a group to reflect the status of wheatbelt wetlands generally. This brief note presents data for waterbird surveys up to 2003 and is intended as an annual mechanism for reporting data from this project.
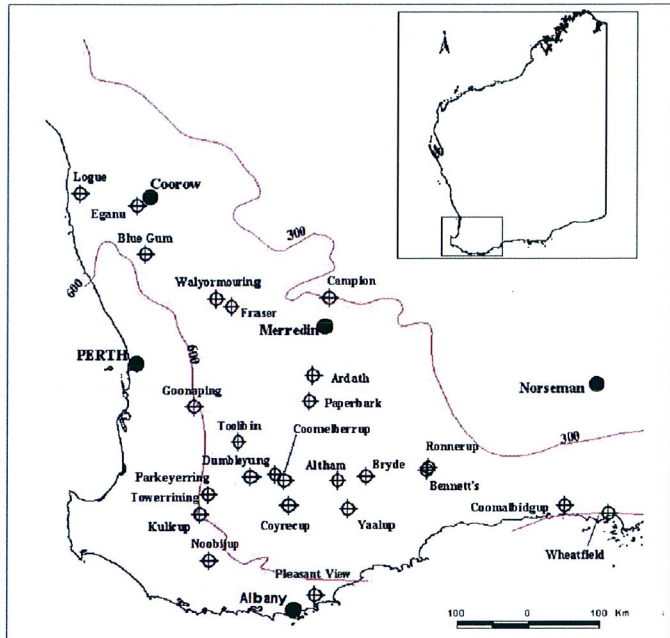
MEAN Z-score for WATERBIRD RICHNESS at all lakes during year of sampling
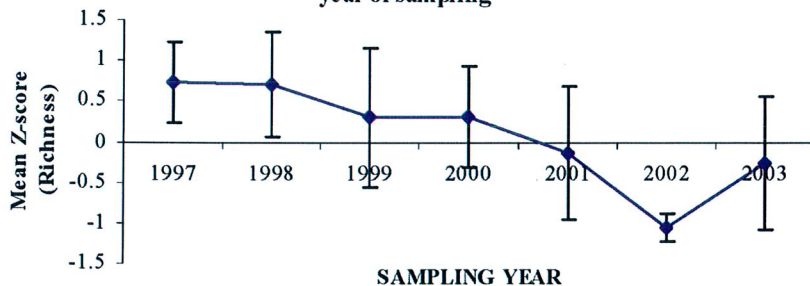
MEAN Z-score for WATERBIRD ABUNDANCE at all lakes during year of sampling
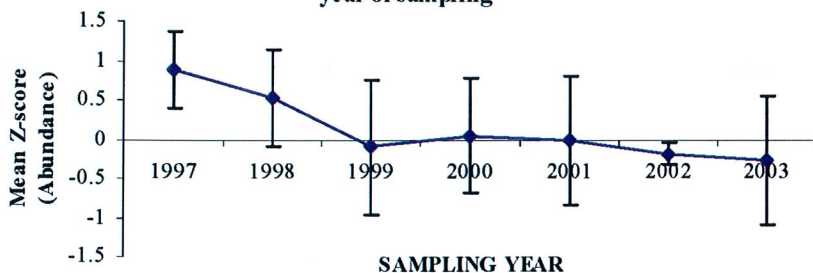
Waterbird Richness and Abundance in the Wheatbelt

The number of species present (Richness), is a valuable measure of biodiversity and abundance is indicative of the productivity of wetlands. The mean z-score for waterbird richness and abundance is calculated in the same way. At each wetland the normal deviate (z) is calculated for each year, from the entire dataset for that wetland. The mean z-score is the average of these annual z scores over all wetlands. Thus, the mean z-score can be used to measure the overall trend in monitored wetlands over time. Values below zero reflect lower than average species richness or waterbird abundance. Over the period of monitoring there has been a decline in waterbird species richness and abundance at the monitored wetlands. This has coincided with a decline in rainfall following 1999 with 2000-2002 showing 'average' to 'very much below average' rainfall over the study area. It is too early to ascribe the reduction in species richness and abundance to low rainfall, although it is intuitive that the lower water levels and higher salinities associated with low rainfall are likely to lead to fewer species using wetlands.

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