Regional variability in Salmon Gum (*Eucalyptus salmonophloia*) woodland communities in the Great Western Woodlands of south-western Australia

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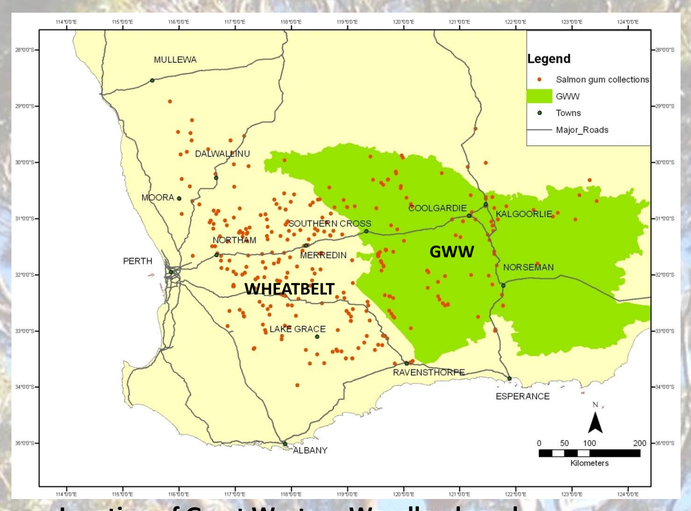
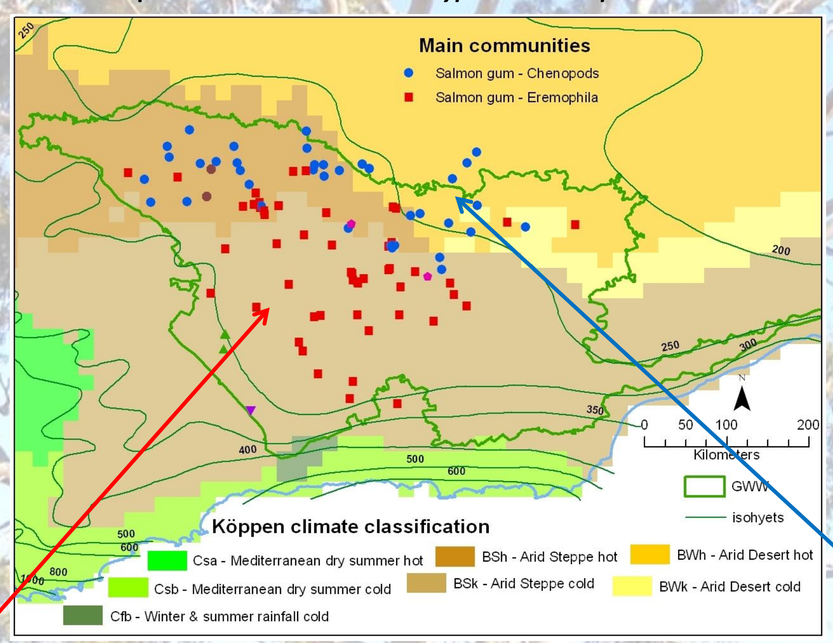
Lakeside Woodlands
lino print by J Harvey

Background Salmon Gum is an iconic Western Australian Eucalypt. In the WA wheatbelt, it is now confined to small, often degraded remnants where as east of the clearing line in the area known as the Great Western Woodlands (GWW) it remains common. Little is known about its structure and understorey composition there, how this is influenced by climatic and edaphic factors, or how the GWW Salmon gum woodlands are related to those in the wheatbelt.

Objectives The aim of the project is to gain a better understanding of the patterns and processes governing the distribution, composition and structure of salmon gum communities across south-western Australia.
Given the paucity of information on salmon gum woodlands in Great Western Woodlands (GWW) prerequisite to the above aim is to survey and analyse the floristic patterns in the salmon gum woodlands and relate them to climate, soils and land use.



Location of Great Western Woodlands and previous collections of *Eucalyptus salmonophloia*



Distribution of GWW salmon gum woodland communities

Methods One hundred 400 m² plots in patches of mature salmon gum woodland were surveyed in 2011 and 2012, stratified to capture the range of variability in climatic, geology/soils, tenure and land use in the GWW. Floristic composition and structure was surveyed, and soil chemical and physical characterised. Patterns in the floristic data were explored using clustering classification techniques chosen by OptimClass, and Correspondence Analysis (CA), Principal Component Analysis (PCA) and Non-metric Multidimensional scaling (NMDS) ordinations. To interpret the influences of the environmental variables, unconstrained PCA and constrained Canonical Correspondence Analysis (CCA) were undertaken.

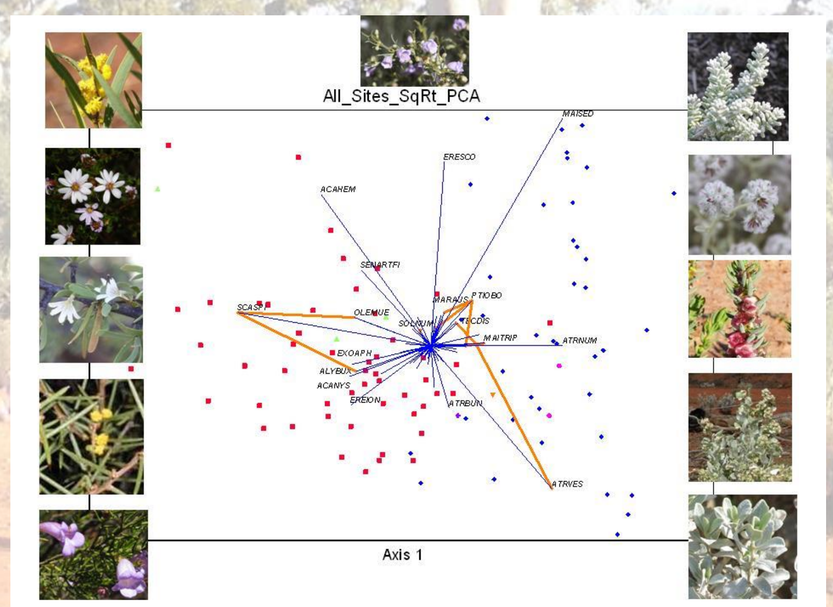
Salmon gum – eremophila community

Results Two Key community types were identified in the GWW Salmon gum woodlands.
When existing data sets from Salmon gum woodlands of the wheatbelt were added to the analysis, these GWW communities remained distinct from the wheatbelt communities.

Salmon gum –chenopod community

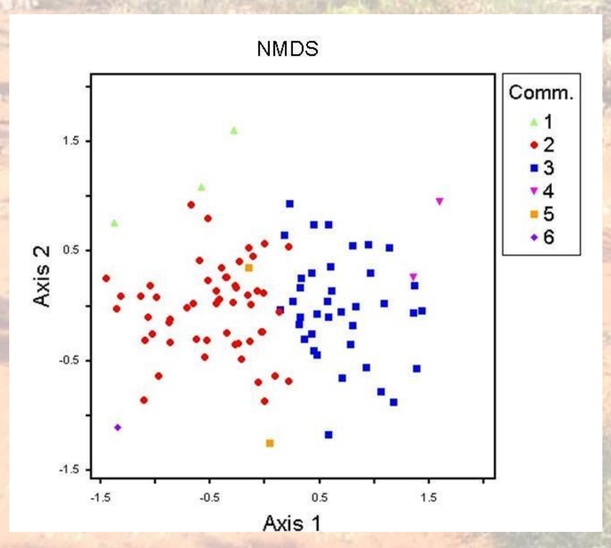
A community dominated by species from the Scrophulariaceae and Fabaceae families occurred on sandier soils in higher (mainly winter) rainfall area to the south-west of the study area.

To the north east where the annual rainfall gets down to 200 mm and the soils have a higher clay content, the understorey community is dominated by Chenopodiaceae species.

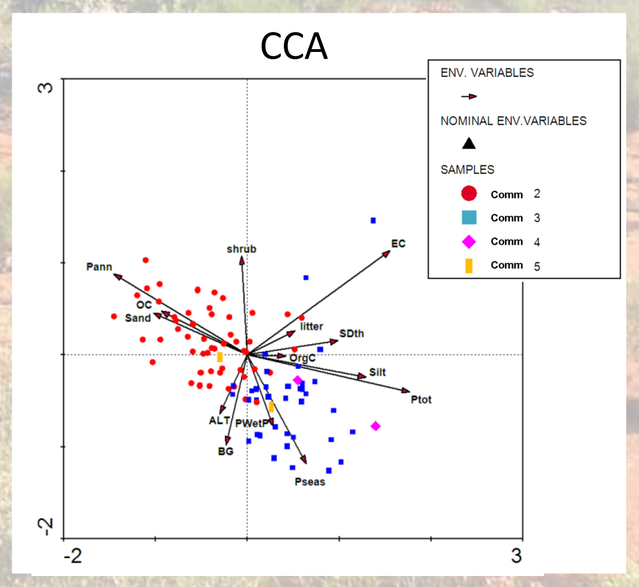


Principal Component Analysis

Species photographs anticlockwise from lower left hand corner *Eremophila ionantha* (EREION), *Acacia nyssophylla* (ACANYS), *Scaevola spinescens* (SCASPI), *Olearia muelleri* (OLEMUE), *Acacia hemiteles* (ACAHEM), *Maireana sedifolia* (MAR SED*), Ptilotus obovatus* (PTIOBO), *Maireana trichoptera* (MAITRIP) *Atriplex nummularia* (ATRNUM and *Atriplex vesicaria* (ATRVES). Other species coded are *Eremophila scoparia* (ERESCO), *Tecticornia disarticulata* (TECDIS), *Marsdenia australis* (MARAUS), *Senna artemisioides* (SENART), *Solanum nummularia* (SOLNUM), *Exocarpos aphyllus* (EXOAPH), *Alyxia buxifolia* (ALYBUX), and *Atriplex bunburyana* (ATRBUN).



Non-metric multidimensional scaling ordination



Canonical Correspondence Analysis ordination

Management Implications The Salmon gum-eremophila community is more likely to be fire prone, indication a need for more intensive fire management. The distinction between communities in the wheatbelt and the GWW confirm the threatened status of the wheatbelt woodlands, relevant to policy issues such as listing of Threatened Ecological Communities.

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