

Perth's *Banksia* woodlands: The dominate banksias

The overstorey of Perth's northern Swan Coastal Plain vegetation consists of an evergreen *Banksia* (Proteaceae) woodland with occasional *Eucalyptus* (Myrtaceae) and *Allocasuarina* (Casuarinaceae) stands. *Melaleuca* (Myrtaceae) tree species fringe the many wetlands.

Five *Banksia* species dominate the overstorey: *B. attenuata*, *B. ilicifolia*, *B. littoralis*, *B. menziesii* and *B. prionotes*. *Banksia prionotes* inhabits the interdunal swales and flat landforms of the northern Swan Coastal Plain, having a strong preference for the deep sandy soils overlying limestone.

Banksia trees have the capacity to access groundwater and deep soil moisture sources via their deep roots contributing 25-61% of woodland transpiration. *Banksia* tree species possess a dimorphic rooting system consisting of a central thick sinker root and subsurface lateral roots from which smaller sinker roots may arise.

Banksia attenuata and *Banksia menziesii*: The two co-dominants

Banksia attenuata and *B. menziesii* co-dominate much of the overstorey, occurring in all topographic locations except those areas prone to waterlogging. Both species are dependent on groundwater during the dry summer, at least at groundwater depths of 2-7 m.

There is ecological evidence to suggest that *B. menziesii* is more drought tolerant than *B. attenuata*¹, and it has been speculated that ultimately *B. menziesii* will replace *B. attenuata* on dune slopes, being better adapted to drier conditions, whereas *Banksia attenuata* will probably persist further downslope².

Studies have shown that groundwater usage of *Banksia attenuata* trees is a function of the groundwater, although there was no difference in summer canopy transpiration rates (170 mL cm⁻² d⁻¹) whether groundwater was accessible (sites < 9 m groundwater depth) or not (site > 30 m groundwater depth)³.

Banksia ilicifolia

B. ilicifolia is restricted to topographic positions where the depth-to-groundwater is less than 10 m, and is highly dependent on summer groundwater³ when the groundwater depth is less than 2 m. Because of this dependency on groundwater at relatively shallow depths, *B. ilicifolia* is considered to be susceptible to groundwater drawdown

Banksia littoralis

B. littoralis is the only *Banksia* species of the northern Swan Coastal Plain confined to the fringes of wetlands and low-lying depressions and is reliant almost exclusively on shallow groundwater all year round. Declin-

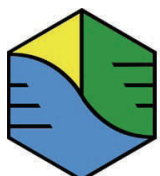
ing tree numbers in *B. littoralis* populations and poor seedling recruitment in recent years has been attributed to long-term decreases in soil moisture contents and declining groundwater levels.



¹Groom et al. (2000) *Ecological Management & Restoration* 1, 117-124.

²Muir (1983) *Western Australian Herbarium Research Notes* 9, 27-39.

³Zencich et al. (2002) *Oecologia* 131, 8-19.



CEDD
Centre for Ecosystem
Diversity and Dynamics

For more information contact:
Dr P. Groom
Department of Environmental Biology
Curtin University GPO Box U1987
Perth Western Australia 6845

Curtin
University of Technology