TECHNICAL NOTE

MU55 Wetland Vegetation

Ian Fordyce, 25/11/10

Subcatchment MU55 drains eastwards and northeastwards into Mongers Lake and its associated wetlands. In most years, the water is dispersed in a group of wetlands near the southernmost extension of Mongers Lake. [Mongers Lake itself is a narrow, elongate playa system of lakes and connecting channels, which are dry and salt-encrusted most of the time.] The fringing wetlands at MU55 occupy an irregular tract of windblown sand, much of the uncleared/ unfarmed portion of which constitute the privately owned blocks Lot 9551 and Lot 4446. Here, subcircular saltlakes, claypans and samphire flats occupy local depressions in the sandplain matrix. The dominant role of wind in shaping this landscape is evident in the pattern of low dunes, upwind-migrating lakes, and downwind, semi-concentric, beach ridges.

Vegetation on the sandplain is a York gum (*Eucalyptus loxophleba* subsp. *supralaevis*) open woodland, over a sparse and patchily dispersed substorey of mixed wattles, eremophilas, melaleucas, proteaceous shrubs, and the ubiquitous mallee saltbush (*Atriplex stipitata*). Substorey shrubs include *Acacia eremaea, A. lineolata, A. ligulata* (umbrella bush), *A. colletioides, A.acuminata* (jam), *A. ramulosa* (horse mulga), *Senna charlesiana* (cassia)*, S. flexuosa, Dodonaea viscosa* (hopbush), *Pimelea microcephala, Hakea recurva* (needle bush)*, Grevillea sarissa, Eremophila miniata* (turpentine), *E. decipiens* (fuchsia), *E. oppositifolia, Scaevola spinescens* (currant bush), *Exocarpos aphyllus* (ballart), *Pittosporum angustifolium* willow), *Santalum acuminatum* (quandong)*, S. spicatum* (sandalwood)*, Templetonia sulcata* (centipede bush), *Jacksonia ramulosa, Lomandra collina, Olearia dampieri, O. muelleri* (Goldfields daisy), *O. pimeleoides, Melaleuca lateriflora, M.thyoides, M. atroviridis* (broombush), *M. eriostachya, Ptilotus obovatus* (cotton bush), *P. eriotrichus, P. polystachyus* (green mull amulla), *P. exaltatus, P. halophilus, Rhagodia drummondii, R. preissii, Enchylaena tomentosa, Maireana brevifolia,* and the lilies *Dianella revoluta* and *Acanthocarpus canaliculatus.*

Groundstorey is usually absent in these woodlands. When present at all, it consists of the grasses *Aristida contorta* (kerosene grass) and *Triodia scariosa* (spinifex), *Sclerolaena diacantha* (grey bindii), *Borya* sp. (resurrection lily), *Calandinia* sp. (parakeelya), and a variety of annuals.

There are small areas where salmon gum (*Eucalyptus salmonophloia*) or salt gum (*E. salicola*) dominates the canopy, and other areas where eucalypts are entirely absent. These latter areas are often monodominant shrublands.

The wetland depressions are overwhelmingly dominated by samphires – mostly species and subspecies in the genus *Tecticornia*, although the cosmopolitan genus *Sarcocornia* is also represented. Individual samphire taxa tend to form monospecific communities, arranged in rings or subconcentric zones around the saltlake/claypan fringe. This pattern seems to be controlled by waterlogging, and by the duration and frequency of flooding, but groundwater pH may play a role (at least for some species). A recurring pattern throughout the region is that the samphire communities on uncleared, relatively pristine lake edges are highly diverse, whereas recently colonised paddocks might be represented by only a few (or even a single) taxon.

Some of the more common samphires at MU55 are *Tecticornia halocnemoides, T. pergranulata, T. doleiformis, T. peltata,* and *T. indica* subsp. *bidens.* See the Yarra Yarra website http://www.yarrayarracatchment.org.au/regionalflora.php (then follow the links through Chenopodiaceae (samphire)) for a full species list.

A number of other chenopod herbs and subshrubs grow on either side of the samphire-woodland boundary. These include Atriplex nana, A. codonocarpa, A. holocarpa, Maireana amoena, M. carnosa, Sclerolaena diacantha, S. eurotioides, Didymathus roei, and Rhagodia drummondii. Other salt-tolerant plants, which can be found amongst the samphire, include Carpobrotus australis (inland pigface), Gunniopsis quadrifida, G. intermedia, G. septifraga, Lawrencia squamata, Frankenia spp., Eragrostis dielsii, and Senecio sp.

In early 2006, several months before the start of drain construction, a long-term program was initiated to monitor the impact on the MU55 vegetation of discharging groundwater. Following DEC's methodology for surveying salt lake vegetation in the nearby Buntine-Marchagee recovery catchment (Richardson *et al.* 2005), three permanent belt-transects (MU55 T1-3) were set up across the margin of the Fifteen Hectare Lake, a site exposed to low-quality groundwater discharge. A further two transects (MU55 T4 & T5) were set up at Lake Placenta, to act as controls. In each case, the transect is laid out perpendicular to the lake shore. It extends from the beach, across the fringing samphire, to woodland/shrubland on the adjacent sandplain. Stations are erected at 10 m intervals, and each station is treated as the centre of a 20 × 10 m quadrat.

A belt transect of this kind is effectively a group of contiguous, 20× 10 m quadrats. At annual intervals, all perennial plant taxa growing within the 20× 10 m area are identified to species or subspecies level. Taxonomy, for the most part, follows Paczkowski & Chapman (2000); nomenclature follows the Western Australian Herbarium's 'Florabase' website. Percentage cover for each taxon is recorded on field sheets, using a slightly modified Braun-Blanquet scale (1 = <1%; 2 = 1-10%; 3 = 10-50%; 4 = 50-90%; 5 = >90%). Structural aspects of the vegetation are described according to the Muir (1977) system.

At the beginning of the environmental monitoring program, based on anecdotal reports and advice from government agencies, we anticipated that there would be gross (and conspicuous) changes in the vegetation, such as massive plant death or clear shifts in community zoning, at discharge sites. On the contrary, and somewhat unexpectedly, we have detected no changes at MU55 that can be unequivocally ascribed to groundwater discharge. At the Fifteen Hectare Lake, some of the blue-grey samphire (previously a subspecies of *Tecticornia halocnemoides,* but now recognised as a distinct species – *T. loriae*) growing on gypsiferous sand on the northern edge (MU55 T1), has died (or has become desiccated, at least) during the period Feb. 2006 – Oct. 2010; *Tecticornia undulata,* once an occasional member of the southern samphire community, is now almost entirely absent at that location (MU55 T2 and T3).

Over a similar period (June 2006 – Oct 2010), I have also observed changes in the vegetation fringing Lake Placenta, a site more than a kilometre from the drain outfall and not exposed to groundwater discharge. (i) There has been a general increase in the proportion of *Tecticornia peltata* in the samphire zone on the western shore (MU55 T5).

(ii) There has been a gradual (and now complete) loss of kerosene grass (*Aristida contorta*) from the lomandra shrubland at the southern end of the lake (MU55 T4).

References

Florabase -- Western Australian Herbariumwebsite.http://florabase.dec.wa.gov.au, accessed Oct.-Dec. 2010.

Muir, B.G. (1977) Biological survey of the Western Australian wheatbelt. Part II: Vegetation and habitat of the Bendering Reserve. *Records of the Western Australian Museum,* **suppl. no. 1**.

Paczkowski, N. & Chapman, A. R. (2000) 'The Western Australian Flora: A Descriptive Catalogue'. Wildflower Society of Western Australia, Western Australian Herbarium, Department of CALM and Botanic Gardens & Parks Authority, Perth.

Richardson, J., Keighery, G. & Manson, W. 2005. A baseline of vegetation health for the Buntine-Marchagee recovery catchment. Department of Environment & Conservation, Perth.

Western Australian Herbarium (1998-) 'Florabase – The Western Australian Flora. Department of Environment & Conservation'. http://www.florabase.dec.wa.gov.au/ [accessed Oct-Dec, 2010]