

Appendix V1
Overview of *A Floristic*
Survey of the Whicher
***Scarp*, Keighery et al.**
2008

APPENDIX V1 OVERVIEW OF “A FLORISTIC SURVEY OF THE WHICHER SCARP”, KEIGHERY ET AL. 2008

Introduction

As well as describing three of the five PECs, the report on the floristics of the Whicher Scarp by Keighery et al. (2008)¹ is of significant importance to the Happy Valley proposal, as it includes several monitoring plots within or in close proximity to the Proposal site and numerous other plots distributed along the entire Whicher Scarp². In this way, the report can be used to compare and/or verify the local surveys and, more importantly, place them in a regional context.

Study method

The approach and method employed by Gibson et al. (1994) was used in the later Whicher study of Keighery et al. (2008). A total of 124 10 m by 10 m quadrats were established, consisting of:

- 44 quadrats selected from the Gibson et al. (1994) study and the DEP (1996) update, being from the 1A, 21b and 10b FCTs or located in woodlands on or near the boundaries of the Whicher Scarp
- 70 quadrats from a series of studies were located across drainage lines and in transects up the scarp, including areas inferred to be similar to those sampled by Gibson et al. (1994) and DEP (1996)
- 10 quadrats established in the Korijekup Conservation Park, in the Shire of Harvey (Darling Scarp).

An estimated 70% of the quadrats were sampled twice at different times of the year, and site-specific information, such as general landscape position, broad soil categories, vegetation structure and dominants and vegetation condition were also recorded. Analysis of the quadrat data was conducted numerically, using PATN modules (Belbin 1987). Groups at the 10, 20 and 40 group levels were made of the quadrats and at the 30, 60, 120 and 240 group levels of the species.

Results – floristic groups

The analysis of the various classification outputs by the authors led to the determination of eight floristic groups (A – H), of which five were further subdivided at different levels of the classification to distinguish a total of 20 subgroups or floristic community types (designated WHSFCT). The groups and sub-groups are summarised in Table 1.

The authors explain the difficulties in resolving and defining the different floristic groups and associations, including:

¹ All references to other works are cited in full in the bibliography to the ERMP.

² The proponent has previously made available the results of vegetation monitoring plots (ESM 1999) and BEC (2006, 2007) to the report's authors. Bemax also gratefully acknowledges the reciprocal availability of data from the authors for its own studies.

- the transitional nature of the Whicher Scarp landscape is reflected in the weak definition of some of the groups
- the number of groups with only one or two quadrats, while other groups had 10 or more.

Overall, however, the authors concluded that the classification generally reflected the upland or wetland location of the quadrats and the major landforms and soils of the study area, but transgressed the major landform units at different levels of the classification.

Comparison with FCTs of Gibson et al. 1994

Keighery et al. (2008) found that:

- their Whicher floristic group B was “effectively equivalent” to SCP Community Type 21b
- their Whicher floristic group C was “virtually equivalent” to SCP Community Type 1a.

Keighery et al. (2008) concluded that there was a “modest accord” between their classification and that of Gibson et al. (1994). In commenting on the strength of this comparison, Griffin (2006 in Bennet 2006, 2008) reported that the original Swan Coastal Plain FCTs were “neither comprehensive (i.e. sufficiently sampled) or detailed (i.e. variation within the FCT accounted for and described) enough for the purposes of defining vegetation communities for conservation assessment”. Consistent with this position, Keighery et al. (2008) base their own conservation and threat assessments for the vegetation of the Whicher Scarp using their own more detailed community types.

Table 1 Summary of floristic groups and sub-groups of Keighery et al. 2008

Floristic Group	Description	Sub-group or FCT*	Plots
Floristic group A: Whicher Scarp woodlands of grey/white sands	Typical plant taxa of Group A are <i>Eucalyptus haematoxylon</i> , <i>Eucalyptus marginata</i> subsp. <i>marginata</i> , <i>Xylomelum occidentale</i> and <i>Banksia attenuata</i> , situated on the grey/white sands on the midslopes of the Whicher Scarp and was rarely associated with laterites. The group is very species rich and diverse. Its distribution is mainly between the Whicher (central) and Dardanup (northern) forest areas. The group had a recognisable level of patterning and five community types are described.	A1: Central Whicher Scarp Mountain Marri woodland	7
		A2: North Whicher Scarp North Whicher Scarp Jarrah and Woody Pear woodland	5
		A3: North Whicher Scarp Banksia and Woody Pear woodland	4
		A4: Whicher Scarp Banksia grandis, Jarrah and Marri woodland	1
		A5: Central/North Whicher Scarp Mountain Marri woodland	6
Floristic group B: Swan Coastal Plain centred woodlands of grey/white sands	Group B is dominated by <i>Banksia attenuata</i> , with <i>Eucalyptus haematoxylon</i> being virtually absent. It is significantly lower in species richness and diversity than Group A. Two community types were distinguished.	B1: Swan Coastal Plain/North Whicher Scarp Banksia attenuata woodland	21
		B2: West Whicher Scarp Banksia attenuata woodland	1
Floristic group C: Whicher Scarp woodlands of coloured sands and laterites	Group C was very commonly associated with the laterite and/or coloured sands of the Whicher Scarp and has a strong affinity with the jarrah forest of the Blackwood Plateau. Typical species include <i>Eucalyptus haematoxylon</i> , <i>Eucalyptus marginata</i> subsp. <i>marginata</i> , <i>Kingia australis</i> , <i>Dasyogon hookeri</i> , <i>Banksia grandis</i> and <i>Adenanthos barbiger</i> . Despite its affinities, a number of the quadrats belonging to this group extend out onto the Swan Coastal Plain, one to over 2 km. Patterning is distinguishable but is less robust than for Group A, with six community types being described. Community types C1 and C2 had a greater frequency of some common and less common sand taxa, with types C3 to C6 having a greater frequency of laterite favouring taxa.	C1: Central Whicher Scarp Jarrah woodland	10
		<u>C2: Whicher Scarp Jarrah woodland of deep coloured sands</u>	8
		C3: Whicher Scarp Jarrah and Mountain Marri woodland on laterites	11
		C4: Whicher Scarp/Blackwood Plateau Jarrah and Marri woodland	17
		C5: Dardanup Jarrah and Mountain Marri woodland on laterite	2
		C6: Swan Coastal Plain Foothills Jarrah woodland on laterite	1
Floristic group D: Woodlands of the Harvey SCP Foothills and Darling Scarp	Group D is from the 10 quadrats in the Korijekup Reserve in Harvey and is outside of the regional area of the proposal.		10
Floristic group E: Jarrah and Marri woodland wetland type 1	Group E is a wetland group consisting of species associated with damp sands (e.g. <i>Pericalymma ellipticum</i>) and wetlands (e.g. <i>Calothamnus lateralis</i>). The group contains 3 quadrats, which could not be further refined.		3
Floristic group F: Jarrah and Marri woodland wetland type 2	Group F is a poorly-defined wetland group consisting of four quadrats containing common and uncommon upland and wetland taxa and considered to be two community types, although only one is sufficiently rigorous to describe:	F1 Sabina River Jarrah and Marri woodland	2
Floristic group G: West Whicher Scarp wetlands	Group G consists of two quadrats from the Carbanup River and is outside of the regional area of this proposal.		2
Floristic group H: Busselton Ironstones	Group H consists of 11 quadrats and represents the wetland community type SWAFCT 10b: Shrublands on southern ironstones, the Busselton Ironstones, as described in Gibson et al. (1994 and 2000). A number of wetland taxa, some of which are restricted, or largely restricted to ironstone surfaces, are found in the group.		11

*Note: The communities shown in bold are relatively robust, while underlined communities are not too dissimilar to the preceding community (from Griffin 2008).