

5.3.4 Reference Group 3: Lowveld: Foothill-gravel Bed sub-region

Sites in this Reference Group fall within the Lowveld ecoregion and are in the Foothill-gravel Bed sub-region.

5.3.4.1 Characterisation of Reference Group 3 in terms of environmental variables

- Channel pattern: predominantly multiple-thread: anastomosing/anabranching.
- Altitude: below 600 m.
- Distance from source: > 50 km.
- Stream order: 4th or 5th.
- Stream width: always > 10 m, and generally > 20 m.
- Shallow-water habitat: median (25th and 75th percentile) depth of 0.35 m (0.30 and 0.43 m), mostly bedrock rapid, some cobble riffle.
- Deep-water habitat: median depth of 0.58 m (0.48 and 0.68 m).
- Substratum: variable with most types present in roughly the following proportions: bedrock (35%), boulder (5%), cobble/pebble (25%) and gravel/sand/mud (35%).
- Biotopes: generally have all three biotope-groups present, with SIC/SOOC the most common (50%), then GSM (35%) and AQV/MV (15%).
- Water chemistry: median, 25th and 75th percentile values are tabulated below (Table 5.14).

Table 5.14 Median, (Q25) and 75th (Q75) percentile values for selected water chemistry variables in Reference Group 3 (n = 27).

Variable	Unit	Median	Q25	Q75
pH		8.2	7.97	8.43
Temperature	°C	20.2	18.7	21.6
Conductivity	mS m ⁻¹	15	14.7	44
Total Dissolved Solids	mg l ⁻¹	99	94	322
Turbidity	NTU	1	1	2
Dissolved Oxygen	mg l ⁻¹	8.54	8.06	9.01
Alkalinity	as meq l ⁻¹ CaCO ₃	1	0.9	2.993
Total Phosphorus	mg P l ⁻¹	0.042	0.038	0.043
Soluble Reactive Phosphorus	mg P l ⁻¹	0.024	0.019	0.028
Kjeldahl Nitrogen	mg N l ⁻¹	0.283	0.23	0.293
Nitrite+Nitrate	mg N l ⁻¹	0.133	0.05	0.79
Ammonium	mg N l ⁻¹	0.04	0.04	0.04
Silica	mg l ⁻¹	8.6	6.3	9.8

5.3.4.2 Composite SASS Scores

Expected median values and O/E ratios in each band have been calculated for Reference Group 3 (Table 5.15) based on multiple-season, combined-biotope sampling, corrected for season. See section 5.3.1.2 for an explanation of interpreting monitoring site data using this table.

Table 5.15 Reference Group 3: Band ranges for O/E SASS4 Scores, O/E taxa and O/E ASPT. Expected median values for calculating O/E ratios are given for multiple-season, autumn, winter and spring for each indice.

Expected median values for calculating O/E	SASS4 Score	Number of Taxa	ASPT
Autumn	116	18	6.71
Winter	154	24	6.38
Spring	182	26	6.23
Band	O/E SASS4 Score	O/E Taxa	O/E ASPT
X	> 1.3	> 1.3	> 1.1
A	> 0.8-1.3	> 0.8-1.3	> 0.9-1.1
B	> 0.6-0.8	> 0.6-0.8	> 0.8-0.9
C	> 0.3-0.6	> 0.5-0.6	> 0.7-0.8
D	< 0.3	< 0.5	< 0.7

5.3.4.3 Expected SASS taxa

Expected taxa for Reference Group 3 are presented in Table 5.16. The frequency of occurrence amongst sites, expressed as a percentage, and biotope and seasonal trends are indicated.

Table 5.16 Expected SASS taxa (present at > 75% of sites within the Reference Group) for Reference Group 3, indicating taxa more commonly recorded in a particular biotope-group (S = SIC/SOOC; V = AQV/MV and G = GSM) or season (W = winter and S = spring).

Order	Taxon	%	Biotope	Season
Ephemeroptera	Baetidae (3 types)	100		
	Caenidae	100		
	Heptageniidae	100	S	
	Leptophlebiidae	89	S	
	Tricorythidae	100	S	
Coleoptera	Dytiscidae	100	V	
	Elmidae/Dryopidae	100	S	
	Gyrinidae	78	V	
Diptera	Chironomidae	100		
	Simuliidae	100	S+G	
	Tabanidae	89	S	
Hemiptera	Corixidae	100		
	Naucoridae	100		
	Veliidae	100	V	
Odonata	Coenagrionidae	78	V	
	Corduliidae	78	G	
	Gomphidae	100	G	
	Libellulidae	100	S	
Crustacea	Natantia (Shrimps)	78	V	
Mollusca	Sphaeriidae	89	G	S

5.3.4.4 Biotope considerations

Expected median values for each biotope-group in each season, together with biological band ranges for O/E ASPT are given in Table 5.17. See section 5.3.1.4 for an explanation of interpreting monitoring site data using this table.

Table 5.17 Reference Group 3: Expected median values for calculating O/E ratios for each season and biotope-group combination. Band ranges (excluding Band X) for O/E ASPT are given for each biotope-group.

Biotope-group	Season	Expected median values for calculating O/E		
		SASS4 Score	Number of Taxa	ASPT
SIC/SOOC	Autumn	63	9	7.00
SIC/SOOC	Winter	89	13	6.81
SIC/SOOC	Spring	125	18	6.29
AQV/MV	Autumn	61	10	6.45
AQV/MV	Winter	81	12	6.75
AQV/MV	Spring	81	13	6.29
GSM	Autumn	39	7	5.75
GSM	Winter	46	9	5.31
GSM	Spring	58	11	5.27
Band		O/E ASPT-SIC/SOOC	O/E ASPT-AQV/MV	O/E ASPT-GSM
A		≥ 0.8	≥ 0.8	≥ 0.9
B		> 0.7-0.8	> 0.6-0.8	> 0.7-0.9
C		> 0.5-0.7	> 0.4-0.6	> 0.6-0.7
D		≤ 0.5	≤ 0.4	≤ 0.6