

5.3.2 Reference Group 2: Great Escarpment Mountains: Mountain Stream, Foothill-cobble Bed and Rejuvenated Cascade sub-regions

Sites in this Reference Group generally fall within the Great Escarpment Mountains ecoregion and are in the Mountain Streams, Foothill-cobble Bed or Rejuvenated Cascade sub-regions.

5.3.2.1 Characterisation of Reference Group 2 in terms of environmental variables

- Channel pattern: single-thread channel of low or high sinuosity, and low or moderate lateral mobility.
- Altitude: above 600 m.
- Distance from source: variable although rarely > 100 km and generally < 50 km.
- Stream order: variable, but dominated by 1st and 2nd order.
- Stream width: mostly < 20 m, and generally < 10 m.
- Shallow-water habitat: median (25th and 75th percentile) depth of 0.24 m (0.20 and 0.30 m), mostly cobble riffle, some bedrock rapid.
- Deep-water habitat: median depth of 0.40 m (0.40 and 0.55 m).
- Substratum: Occasionally bedrock present (< 5%), but mostly dominated by cobble/pebble (60%) with boulder (20%) and gravel/sand/mud (15%).
- Biotopes: generally have all three biotope-groups present, with SIC/SOOC the most common (80%), then AQV/MV (10%) and GSM (10%).
- Water chemistry: median, 25th and 75th percentile values are tabulated below (Table 5.6).

Table 5.6 Median, (Q25) and 75th (Q75) percentile values for selected water chemistry variables in Reference Group 2 (n = 87).

Variable	Unit	Median	Q25	Q75
pH		7.67	7.5	7.9
Temperature	°C	15.1	13.9	16.2
Conductivity	mS m ⁻¹	6.7	5.3	11
Total Dissolved Solids	mg l ⁻¹	49	38	88
Turbidity	NTU	1	1	2
Dissolved Oxygen	mg l ⁻¹	8.77	8.45	9.6
Alkalinity	as meq l ⁻¹ CaCO ₃	0.547	0.4	1.04
Total Phosphorus	mg P l ⁻¹	0.016	0.013	0.022
Soluble Reactive Phosphorus	mg P l ⁻¹	0.013	0.011	0.015
Kjeldahl Nitrogen	mg N l ⁻¹	0.11	0.09	0.13
Nitrite+Nitrate	mg N l ⁻¹	0.107	0.077	0.187
Ammonium	mg N l ⁻¹	0.04	0.04	0.04
Silica	mg l ⁻¹	5.6	4.9	7.1

5.3.2.2 Composite SASS Scores

Expected median values and O/E ratios in each band have been calculated for Reference Group 2 (Table 5.7) 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 5.7 Reference Group 2: 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	158	23	6.83
Winter	174	24	7.24
Spring	177	25	6.98
Band	O/E SASS4 Score	O/E Taxa	O/E ASPT
X	> 1.3	> 1.2	> 1.1
A	> 0.7-1.3	> 0.7-1.2	> 0.9-1.1
B	> 0.4-0.7	> 0.5-0.7	> 0.8-0.9
C	> 0.1-0.4	> 0.2-0.5	> 0.6-0.8
D	< 0.1	< 0.2	< 0.6

5.3.2.3 Expected SASS taxa

Expected taxa for Reference Group 2 are presented in Table 5.8. The frequency of occurrence amongst sites, expressed as a percentage, and biotope and seasonal trends are indicated.

Table 5.8 Expected SASS taxa (present at > 75% of sites within the Reference Group) for Reference Group 2, 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	97		
	Leptophlebiidae	97	S	
	Tricorythidae	100	S	
Coleoptera	Elmidae/Dryopidae	93	S	
	Gyrinidae	90	V	
	Psephenidae	86	S	
Trichoptera	Psychomyiidae	86	S	W
Diptera	Athericidae	100	S	
	Ceratopogonidae	83	G	
	Chironomidae	100		
	Simuliidae	100	S+V	
	Tabanidae	83	S	
	Tipulidae	93	S	
Hemiptera	Veliidae	100	V	
Odonata	Aeshnidae	86	S	
	Coenagrionidae	83	V	
	Gomphidae	93	G	
Annelida	Oligochaeta	86	S+G	
Crustacea	Brachyura (Crabs)	93	S	
Platyhelminthes	Planariidae	86	S	

5.3.2.4 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 5.9. See section 5.3.1.4 for an explanation of interpreting monitoring site data using this table.

Table 5.9 Reference Group 2: 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	122	17	7.21
SIC/SOOC	Winter	126	16	7.52
SIC/SOOC	Spring	120	17	7.06
AQV/MV	Autumn	70	11	6.22
AQV/MV	Winter	96	12	6.85
AQV/MV	Spring	70	13	6.29
GSM	Autumn	57	10	6.57
GSM	Winter	69	10	6.72
GSM	Spring	74	11	6.58
Band		O/E ASPT-SIC/SOOC	O/E ASPT-AQV/MV	O/E ASPT-GSM
A		≥ 0.9	≥ 0.8	≥ 0.7
B		$> 0.7-0.9$	$> 0.6-0.8$	$> 0.4-0.7$
C		$> 0.6-0.7$	$> 0.4-0.6$	≤ 0.4
D		≤ 0.6	≤ 0.4	