VT DEC macroinvertebrate biocriteria thresholds for different water quality classes and stream management types

From: Part 2 Biocriteria for Fish and Macroinvertebrate Assemblages in Vermont Wadeable Streams and Rivers-Implementation Phase, p. 13, In: "*VT DEC 2004. Wadeable Stream Biocriteria Development and Implementation Methods for Fish, Macroinvertebrate Assemblages in VT Wadeable Streams and Rivers, 158 pp.*"

Table 2. Macroinvertebrate assemblage biocriteria thresholds for three macroinvertebrate community stream categories, and associated WQ Classes or Management Types in Vermont. Extreme departures from the criteria thresholds indicate either a very poor biological condition or an assemblage of exceptionally high value.

	Small-size High Gradient Streams (SHG)			Medium-size High Gradient Streams (MHG)			Warm Water Medium Gradient Streams and Rivers (WWMG)		
WQ Class	A1 (ecological)	B - WMT1	B B - WMT 2-3 A2 (water supply)	A1 (ecological)	B - WMT 1	B B - WMT 2-3 A2 (water supply)	A1 (ecological)	B - WMT 1	B B - WMT 2-3 A2 (water supply)
Metric	Reference Condition	Minimal Change from the Reference Condition	Moderate Change from the Reference Condition (undue adverse effect)	Reference Condition	Minimal Change from the Reference Condition	Moderate Change from the Reference Condition (undue adverse effect)	Reference Condition	Minimal Change from the Reference Condition	Moderate Change from the Reference Condition (undue adverse effect)
Richness	> 35	> 31	> 27	> 43	> 39	> 30	> 40	> 35	>30
EPT	> 21	>19	> 16	> 24	> 22	> 18	> 21	> 19	> 16
PMA-O	>65	> 55	> 45	> 65	> 55	> 45	> 65	> 55	> 45
BI	< 3.00	< 3.50	< 4.50	< 3.50	< 4.00	<5.00	< 4.25	< 4.75	< 5.40
% Oligo	< 2	< 5	< 12	< 2	< 5	< 12	< 2	< 5	< 12
EPT/ EPT+C	> 0.65	> 0.55	> 0.45	> 0.65	> 0.55	> 0.45	> 0.65	> 0.55	> 0.45
PPCS-FG	> 0.50	> 0.45	> 0.40	> 0.50	> 0.45	> 0.40	> 0.50	> 0.45	> 0.40
Density	>500	>400	>300	>500	>400	>300	>500	>400	>300

Summary version of VT numeric biocriteria for Small-size high gradient streams

WQ Class	Score	Density	Richness	EPT	PMA-O	BI	% Oligo	EPT/ EPT+C	PPCS-F
A-1	Full Suppor	>605	>36	>22	>70	<2.70	<1%	>0.67	>.55
	Threshold	≥500	≥35	≥21	≥65	≤3.00	≤2%	≥0.65	≥.50
	Non-Suppor	<450	<34	<20	<60	>3.30	>3%	<0.63	<.45
B1	Full Suppor	>450	>32	>20	>60	<3.35	<3.5%	>0.57	>.50
	Threshold	≥400	≥31	≥19	≥55	≤3.50	≤5%	≥0.55	≥.45
	Non-Suppor	<350	<30	<18	<50	>3.65	>6.5%	<0.53	<.40
B, B2-3, A2	Full Suppor	>350	>28	>17	>50	<4.35	<9.5%	>0.47	>.45
	Threshold	≥300	≥27	≥16	≥45	≤4.50	≤12%	≥0.45	≥.40
	Non-Suppor	<250	<26	<15	<40	>4.65	>14.5%	<0.43	<.35

Appendix E. QHEI metric scores for sites in the Moon Brook watershed.

River Mile	QHEI	QHEI Metrics: Substrate	Cover	Channel	Riparian	Pool	Riffle	Gradient & Score	Narrative
(67002) Moon Brook									
Year: 2014									
3.2	**69.00**	16.5	13.0	15.0	9.50	4.0	7.0	122.0 - (4)	**Good**
2.9	**65.00**	17.0	13.0	12.0	6.50	7.0	5.5	108.0 - (4)	**Good**
2.2	**61.50**	17.0	11.0	13.0	4.00	7.0	5.5	128.0 - (4)	**Good**
1.8	**65.50**	16.5	14.0	15.0	4.50	7.0	4.5	56.10 - (4)	**Good**
1.5	**72.00**	17.0	14.0	13.5	5.00	7.0	5.5	29.50 - (10)	**Good**
1.3	**52.00**	14.5	8.0	9.0	3.00	5.0	2.5	25.90 - (10)	**Fair**
0.9	**57.00**	13.5	13.0	8.5	3.50	6.0	2.5	25.90 - (10)	**Fair**
0.4	**49.50**	8.5	10.0	8.0	6.00	7.0	0.0	21.40 - (10)	**Fair**
0.1	**49.75**	9.5	13.0	9.5	2.75	9.0	0.0	7.10 - (6)	**Fair**
(67003) Mussey Brook									
Year: 2014									
0.4	**43.00**	8.5	10.0	4.0	3.50	6.0	1.0	17.60 - (10)	**Poor**
0.1	**58.75**	14.0	11.0	9.5	5.25	6.0	3.0	17.60 - (10)	**Fair**
(67004) Mine Paint Brook									
Year: 2014									
0.1	**72.50**	19.5	16.0	15.0	6.00	6.5	5.5	125.0 - (4)	**Good**