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# **Development of Benthos-to- Sculpin Trophic Transfer Factors**



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***I Development of Benthos-to-Sculpin Trophic Transfer Factors***

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## Appendix I

### Development of Benthos-to-Sculpin Trophic Transfer Factors

This appendix develops site-specific Trophic Transfer Factors (TTFs) from metals data for slimy sculpin (*Cottus cognatus*) and benthic-macroinvertebrate samples from Red Devil Creek; the data are presented in Appendices G and H, respectively. TTFs were calculated for 15 metals using the following equation:

$$\text{TTF} = C_f/C_b$$

Where:

TTF = Trophic Transfer Factor (unitless)

$C_f$  = Sculpin metal concentration (mg/kg wet weight)

$C_b$  = Benthic macroinvertebrate metal concentration (mg/kg dry weight)

Benthos-to-Sculpin TTFs are provided in Table I-1.

**Table I-1. Trophic Transfer Factors for Metals Developed from Sculpin and Benthos Data from Red Devil Creek.**

Analyte	Slimy Sculpin EPC		Benthic Macroinvertebrate EPC		TTF (unitless)
	(mg/kg wet)	Source	(mg/kg wet)	Source	
Antimony	17.1	Appendix G	21.44	Appendix H	0.80
Arsenic	13.0	Appendix G	206	Appendix H	0.063
Barium	3.6	Appendix G	10.1	Appendix H	0.36
Beryllium	0.013	-- (a)	0.013	-- (a)	1.00
Cadmium	0.046	Appendix G	0.100	Appendix H	0.46
Chromium	0.20	Appendix G	0.543	Appendix H	0.37
Cobalt	(b)	--	(b)	--	--
Copper	1.24	Appendix G	10.2	Appendix H	0.12
Lead	0.023	Appendix G	0.296	Appendix H	0.077
Manganese	15.4	Appendix G	111	Appendix H	0.14
Mercury	1.4	Appendix G	2.1	Appendix H	0.66
Methylmercury	0.21	Appendix G	0.076	Appendix H	2.74
Nickel	0.14	Appendix G	1.9	Appendix H	0.08
Selenium	1.43	Appendix G	3.1	Appendix H	0.46
Silver	(b)	--	(b)	--	--
Thallium	(b)	--	(b)	--	--
Vanadium	0.18	Appendix G	0.75	Appendix H	0.24
Zinc	25.6	Appendix G	45.0	Appendix H	0.57

**Key:**

-- (dash) = not available.

EPC = exposure point concentration

MDL = method detection limit

TTF = trophic transfer factor

**Notes:**

a = not detected; one-half MDL used as EPC.

b = not analyzed in slimy sculpin or benthos