CARNELIAN-MARINE-ST. CROIX WATERSHED MANAGEMENT PLAN

APPENDIX B

Lake and Stream Monitoring Plans

	2000 48																										
Name	2008-17 GS TP	Monitoring Category	Lake number	Zone	Shallow?	Type	2022	2022 Cost	2023	2023 Cost	2024	2024 Cost	2025	2025 Cost	2026	2026 Cost	2027	2027 Cost	2028	2028 Cost	2029	2029 Cost	2030	2030 Cost	2031	2031 Cost	Total 10-Year Cost
Alice Lake	20	Northern District	82-0287-00	1	Shallow	Rotation	7 SWQ	\$785		\$0		\$0	7 SWQ	\$858		\$0		\$0	7 SWQ	\$937		\$0		\$0	7 SWQ	\$1,024	\$3,605
Barker Lake	79	Carnelian Creek Corridor	82-0076-00	2	Shallow	Limited		\$0		\$0		\$0	7 SWQ	\$1,109		\$0		\$0		\$0		\$0	7 SWQ	\$1,286		\$0	
Bass Lake	27	Carnelian Creek Corridor	82-0035-00	1	Shallow	Rotation	7 SWQ 14 SWQ +	\$785	14 SWQ +	\$0	14 SWQ +	\$0	7 SWQ 14 SWQ +	\$858	14 SWQ +	\$0	14 SWQ +	\$0	7 SWQ 14 SWQ +	\$937	14 SWQ +	\$0	14 SWQ +	\$0	7 SWQ 14 SWQ +	\$1,024	
Big Carnelian Lake	17	Carnelian Creek Corridor	82-0049-00	1	Deep	Sentinel	Temp/DO	\$1,998	Temp/DO	\$2,058	Temp/DO	\$2,119	Temp/DO	\$2,183	Temp/DO	\$2,248	Temp/DO	\$2,316	Temp/DO	\$2,385	Temp/DO	\$2,457	Temp/DO	\$2,531	Temp/DO	\$2,607	
					_		14 SWQ +	\$2,550	14 SWQ +	72,030	14 SWQ +	ŲL,113	14 SWQ +	Ş2,103	14 SWQ +	ŞE,E40	14 SWQ +	\$2,510	14 SWQ +	Ş2,505	14 SWQ +	\$2,437	14 SWQ +	72,331	14 SWQ +	\$2,007	
Big Marine Lake	19	Big Marine	82-0052-04	2	Deep	Sentinel	Temp/DO	\$2,458	Temp/DO	\$2,532	Temp/DO	\$2,608	Temp/DO	\$2,686	Temp/DO	\$2,767	Temp/DO	\$2,850	Temp/DO	\$2,935	Temp/DO	\$3,023	Temp/DO	\$3,114	Temp/DO	\$3,207	
Carol Lake	31	Silver Creek Corridor	82-0017-00	1	Shallow	Rotation		\$0	7 SWQ	\$809		\$0		\$0	7 SWQ	\$884		\$0		\$0	7 SWQ	\$966		\$0		\$0	\$2,658
Clear Lake	12	Landlocked Basin	82-0045-00	1	Shallow	Partnership	7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		
							ONLY	\$493	ONLY	\$508	ONLY	\$523	ONLY	\$539	ONLY	\$555	ONLY	\$572	ONLY	\$589	ONLY	\$607	ONLY	\$625	ONLY	\$644	\$5,655
East Boot Lake*	25 67	Landlocked Basin Big Marine	82-0034-00 82-0064-00	2	Deep Shallow	Rotation	70110	\$0	7.0110	\$0	7 SWQ	\$833	70110	\$0	20110	\$0	7 SWQ	\$910	20110	\$0	70110	\$0	7040	\$0	70110	\$0	\$1,743 \$11.639
German Lake	19	Northern District	82-0056-00	2	Shallow	Rotation	7 SWQ 7 SWQ	\$1,015 \$1,015	7 SWQ	\$1,046 \$0	7 SWQ	\$1,077 \$0	7 SWQ 7 SWQ	\$1,109 \$1,109	7 SWQ	\$1,143 \$0	7 SWQ	\$1,177 \$0	7 SWQ 7 SWQ	\$1,212 \$1,212	7 SWQ	\$1,249 \$0	7 SWQ	\$1,286 \$0	7 SWQ	\$1,325 \$0	\$11,639
				-			7 3WQ			30		30	7 3WQ	\$1,105		30		30	7 3WQ	31,212		30		30			25,337
Goose Lake	43	Northern District	82-0059-00	2	Deep	Routine	7 SWQ	\$1,015	7 SWQ	\$1,046	7 SWQ	\$1,077	7 SWQ	\$1,109	7 SWQ	\$1,143	7 SWQ	\$1,177	7 SWQ	\$1,212	7 SWQ	\$1,249	7 SWQ	\$1,286	7 SWQ	\$1,325	\$11,639
Hay Lake	44	Northern District	82-0065-00	2	Shallow	Routine	7 SWQ	\$1,015	7 SWQ	\$1,046	7 SWQ	\$1,077	7 SWQ	\$1,109	7 SWQ	\$1,143	7 SWQ	\$1,177	7 SWQ	\$1,212	7 SWQ	\$1,249	7 SWQ	\$1,286	7 SWQ	\$1,325	\$11,639
Jellum's Lake	55	Big Marine	82-0052-02	2	Shallow	Routine	7 SWQ	\$1,015	7 SWQ	\$1,046	7 SWQ	\$1,077	7 SWQ	\$1,109	7 SWQ	\$1,143	7 SWQ	\$1,177	7 SWQ	\$1,212	7 SWQ	\$1,249	7 SWQ	\$1,286	7 SWQ	\$1,325	\$11,639
Little Carnelian Lake	2	Carnelian Creek Corridor	82-0014-00	1	Deep	Sentinel	14 SWQ + Temp/DO	\$1,998	14 SWQ +	\$2,058	14 SWQ + Temp/DO	\$2,119	14 SWQ + Temp/DO	\$2,183	14 SWQ + Temp/DO	\$2,248	14 SWQ + Temp/DO	\$2,316	14 SWQ + Temp/DO	\$2,385	14 SWQ + Temp/DO	\$2,457	14 SWQ + Temp/DO	\$2,531	14 SWQ + Temp/DO	\$2,607	
Long Lake (May Twp)	38	I andlocked Basin	82-0030-00	1	Shallow	Routine	7 SWQ	\$1,998	7 SWQ	\$2,058	7 SWQ	\$2,119	7 SWQ	\$2,183	7 SWQ	\$2,248	7 SWQ	\$2,316	7 SWQ	\$2,385	7 SWQ	\$2,457	7 SWQ	\$2,531	7 SWQ	\$1,024	\$22,901
Long Lake (Scandia)	65	Big Marine	82-0068-00	2	Shallow	Routine	7 SWQ	\$1,015	7 SWQ	\$1,046	7 SWQ	\$1,077	7 SWQ	\$1,109	7 SWQ	\$1,143	7 SWQ	\$1,177	7 SWQ	\$1,212	7 SWQ	\$1,249	7 SWQ	\$1,286	7 SWQ	\$1,325	\$11,639
Loon Lake	113	Silver Creek Corridor	82-0015-02	1	Shallow	Limited		\$0		\$0		\$0	7 SWQ	\$858		\$0		\$0		\$0		\$0	7 SWQ	\$994		\$0	\$1,852
Louise Lake	114	Silver Creek Corridor	82-0025-00	1	Shallow	Limited		\$0		\$0		\$0	7 SWQ	\$858		\$0		\$0		\$0		\$0	7 SWQ	\$994		\$0	\$1,852
Maple Marsh*	NA	Carnelian Creek Corridor	82-0038-00	2	Shallow	Routine	14 SWQ	\$1,998	14 SWQ	\$2,058		\$0		\$0		\$0		\$0		\$0		\$0		\$0		\$0	\$4,055
Mays Lake	21	Landlocked Basin	82-0033-00	1	Deep	Partnership	7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		7 Secchi		
Mud I ake	90	Carnelian Creek Corridor	82-0026-02	2	Shallow	Limited	ONLY	\$493	ONLY	\$508	ONLY	\$523	ONLY	\$539	ONLY	\$555	ONLY	\$572	ONLY	\$589	ONLY	\$607	ONLY	\$625	ONLY	\$644	\$5,655
North Twin Lake	25	Silver Creek Corridor	82-0026-02	1	Shallow	Rotation		\$0 \$0	7 SWQ	\$0		\$0 \$0	7 SWQ	\$1,109 \$0	7 SWQ	\$0		\$0 \$0		\$0 \$0	7 SWQ	\$0 \$966	7 SWQ	\$1,286 \$0		\$0 \$0	\$2,396 \$2,658
Sand Lake	39	Northern District	82-0067-00	2	Shallow	Routine	7 SWQ	\$1,015	7 SWQ	\$1,046	7 SWQ	\$1,077	7 SWQ	\$1,109	7 SWQ	\$1,143	7 SWQ	\$1,177	7 SWQ	\$1,212	7 SWQ	\$1,249	7 SWQ	\$1,286	7 SWQ	\$1,325	\$11,639
Silver Lake	30	Silver Creek Corridor	82-0016-00	1	Shallow	Rotation		\$0	7 SWQ	\$809		\$0		\$0	7 SWQ	\$884		\$0		\$0	7 SWQ	\$966		\$0		\$0	\$2,658
South Twin Lake	52	Silver Creek Corridor	82-0019-00	1	Shallow	Routine	7 SWQ	\$785	7 SWQ	\$809	7 SWQ	\$833	7 SWQ	\$858	7 SWQ	\$884	7 SWQ	\$910	7 SWQ	\$937	7 SWQ	\$966	7 SWQ	\$994	7 SWQ	\$1,024	\$9,000
Square Lake	11	Landlocked Basin	82-0046-00	1	Deep	Sentinel	14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		14 SWQ +		
				<u> </u>			Temp/DO	\$1,998	Temp/DO	\$2,058	Temp/DO	\$2,119	Temp/DO	\$2,183	Temp/DO	\$2,248	Temp/DO	\$2,316	Temp/DO	\$2,385	Temp/DO	\$2,457	Temp/DO	\$2,531	Temp/DO	\$2,607	\$22,901
Staples Lake	22	Landlocked Basin	82-0028-00	2	Shallow	Limited	70 11	\$0	20 11	\$0	70 11	\$0	7 SWQ	\$1,109	20 11	\$0	20 11	\$0	20 11	\$0	20 11	\$0	7 SWQ	\$1,286		\$0	\$2,396
Terrapin Lake	18	Landlocked Basin	82-0031-00	1	Shallow	Partnership	7 Secchi ONLY	\$493	7 Secchi ONLY	\$508	7 Secchi ONLY	\$523	7 Secchi ONLY	\$539	7 Secchi ONLY	\$555	7 Secchi ONLY	\$572	7 Secchi ONLY	\$589	7 Secchi ONLY	\$607	7 Secchi ONLY	\$625		\$0	
Turtle Lake	81	Carnelian Creek Corridor	82-0036-00	2	Shallow	Limited	ONET	\$0	OIVET	\$0	ONET	\$0	7 SWQ	\$1.109	ONE	\$0	ONET	\$0	ONET	\$0	ONE	\$0	7 SWQ	\$1.286		\$0	\$2,396
Twin Lake (May Twp)	32	Landlocked Basin	82-0048-00	1	Shallow	Rotation		\$0		\$0	7 SWQ	\$833		\$0		\$0	7 SWQ	\$910		\$0		\$0	7 SWQ	\$994		\$0	
West Boot Lake	16	Landlocked Basin	82-0044-00	1	Deep	Rotation		\$0		\$0	7 SWQ	\$833		\$0		\$0	7 SWQ	\$910		\$0		\$0	7 SWQ	\$994		\$0	\$2,737
			Total		itoring Cost (v		2022	\$22,176	2023	\$22,604	2024	\$21,163	2025	\$28,203	2026	\$22,452	2027	\$23,125	2028	\$24,094	2029	\$24,534		\$31,409		\$24,360	\$244,119
				N	umber of Lak	es Monitored		19		19		18		24		18		18		18		18		23		16	191
Lake Levels (All) Lake Levels (Only Those Mor	mitared)							\$7,707 \$3.370		\$8,056		\$8,578		\$7,227 \$4,674		\$9,100 \$3,539		\$9,373 \$3,645		\$9,519 \$3,793		\$9,944 \$3,867		\$8,713 \$5.173		\$10,942 \$3,679	\$89,157 \$38.516
		: 3 yrs for baseline; 8 of 10 yrs	for statistical trend	4				\$1,500		\$1,500		\$1,500		\$1,500		\$1,500		\$1,500		\$1,500		\$1,500		\$1,500		\$1,500	\$15,000
		Analysis, Progress To Goals,			ebsite			\$10.132		\$11,071		\$11,403		\$11.745		\$12.098		\$12,461		\$12,834		\$13,219		\$13,616		\$14.024	\$122.604
					LL lake level (1	with inflation)	2022	\$41,515	2023	\$43,231	2024	\$42,644	2025	\$48,675	2026	\$45,149	2027	\$46,459	2028	\$47,947	2029	\$49,197		\$55,237		\$50,827	\$470,880
		Tota	l Cost with only	monitore	ed lake level (1	with inflation)	2022	\$37,178	2023	\$38,614	2024	\$37,402	2023	\$46,122	2020	\$39,589	2027	\$40,731	2028	\$42,221	2025	\$43,120		\$51,697		\$43,564	\$420,239
* Footnotes	201	(son he shoused her-)																									
Inflation = Unique regiments:	3%	(can be changed here)																									
	No water qu	ality is available since 2001,	so two years of d	diagnostic	level monitori	ing is																					
		ed. This includes monitoring																									
	times each y	rear from 2022 to 2023.																									
East Boot Lake	1																										
	Recommend	led pursuing 303(d) delisting	ţ.																								
Monitoring Types:	Monitoring	of surface water quality (TP,	Chl.a Sacchil for	rteen tim	or oach voor U	Junglimnetic																					
		of surface water quality (1P, of surface water quality (TP,																									
		ygen (DO) profiles are taken				peruture or																					
		schedule every three years				high quality																					
	lakes.																										
		of water avality /TD Chi a C	acchi) cavan tima	c a vear or	nco aveny fivo	unare Lakes																					
		of water quality (TP, Chl-a, S		s a year or	lice every live	years. Lakes																					
	are very far	from the impairment thresh	old.																								
Partnership	are very far Partnership		old. Iter to collect mor	nthly Secc	hi and visual o	observations of																					

Name	2003 Stream Health Grade	2014 Stream Health Grade	2022 Goal	Impaired	? Trout?	2015 Imp. Strategy	2032 Outcome	2022	2022 Cost	2023	2023 Cost	2024	2024 Cost	2025	2025 Cost	2026	2026 Cost	2027	2027 Cost	2028	2028 Cost	2029	2029 Cost	2030	2030 Cost	2031	2031 Cost
Clapp's	A+	A+	A+		Х	Routine	Preserve	Level + Temp	Х					Level + Temp	Х									Level + Temp	х		
Zavoral's	A	B+	A		X	Focused	Improve	Level + Temp	X					Level + Temp	X									Level + Temp	X		
Foster's	A-	A-	A-		X	Routine	Preserve	Level + Temp	Х					Level + Temp	X									Level + Temp	X		
Judd Street	A-	A-	A-			Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	х		
Arcola	A-	B+	A-		X	Focused	Improve	Baseflow	х					Baseflow	Х									Baseflow	х		
Campsite No. 1	B+	В	В			Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	х		
Campsite No. 2	Α	В	B+		X	Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	Х		
Dunn's	В	В	В			Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	Х		
Fall's	В	В	B+		х	Focused	Improve	Level + Temp	х	Level + Temp	х	Level + Temp	х	Level + Temp	×	Flow + WQ	x	Flow + WQ	х	Flow + WQ	x	Flow + WQ	x	Flow + WQ	x	Flow + WQ	x
Silver	B-	B-	B-			Routine	Preserve	WOMP	х	WOMP	х	WOMP	х	WOMP	х	WOMP	х	WOMP	х	WOMP	х	WOMP	х	WOMP	х	WOMP	х
William O'Brien	В	B-	В			Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	х		
Marine Landing	A-	B-	Α			Focused	Improve	Baseflow	х		_			Baseflow	х									Baseflow	х		
Mill Stream	A	В	Α		х	Focused	Restore	Level + Temp	х	Level + Temp	х	Level + Temp	х	Level + Temp	х	Flow + WQ	x	Flow + WQ	x	Flow + WQ	х						
Spring	Α	С	Α		X	Focused	Improve	Level + Temp	х					Level + Temp	х									Level + Temp	х		
Willow Brook	A-	С	B+		х	Focused	Restore	Level + Temp	х	Level + Temp	х	Level + Temp	x	Level + Temp	x									Level + Temp	x		
Cedar Bend Trout Farm	В	С	С			Focused	Improve	Baseflow	х					Baseflow	х									Baseflow	х		
Arcola Court	C-	C-	C-			Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	х		
Highway 95 Ravine	C-	C-	C-			Routine	Preserve	Baseflow	х					Baseflow	х									Baseflow	Х		
Gilbertson's	A	B-	A	E. Coli	X	Focused	Restore	Level + Temp	х					Level + Temp	х	Molecular	х							Level + Temp	Х		
Swedish Flag	A-	С	B+	E. Coli		Focused	Restore	Baseflow	х					Baseflow	х	Molecular	х						_	Baseflow	х		
Carnelian Creek	B-	B-	B-	E. Coli		Focused	Improve	Level + Temp	х	Level + Temp	x	Level + Temp	x	Level + Temp	x	Flow + WQ	х	Flow + WQ	x								
Carnelian Creek	B-	B-	B-	E. Coli		Focused	Improve								_			Bacteria	х								
ALL - Spring Creeks				-			-	Macro-I Sampling	х					Macro-I Sampling	x									Macro-I Sampling	х		
St. Croix	-		-			-																					-
Monitoring Types:																											
Baseflow	Fall basefle	w flowmator	rampling (1v) at most d	ownetroom	road crossing																					
Level + Temp	Fall baseflow flowmeter sampling (1x) at most downstream road crossing. Continuous level (for baseflow or H&H) and temperature via District owned logger (Apreciation of the Continuous level (1x) and the Continuous level (1x) and the Continuous level (1x) and the Continuous level (1x) are continuous level (1x) and the Continuous level (1x) are continuous																										
Macro-I Sampling	Oct) - install, 6x flow/data, removal. Macroinvertebrate sampling, May & September, one location.																										
Rapid Assmnt	Pre-geomorph (inventory of in-stream instabilities, instream habitat degredation and noting terrestrial invasives).																										
Targeted Trib	Continuous	flow and grab	sampling	per SWA and	/or Rapid A	Assessment.																					
Corridor Study	Geomorpho		vertebrate			ns), 3yrs Continu	ous Flow + WQ,																				
Bacteria	exclusions.																										
Molecular		iomark testin	g to confin	m wildlife so	urce and if	wildlife, delist.																					
Flow + WQ						ame, acrist.																					
	Continuous flow monitor and auto sampler (Apr-Oct).																										
WOMP	Per grant ag	reement.						I .																			