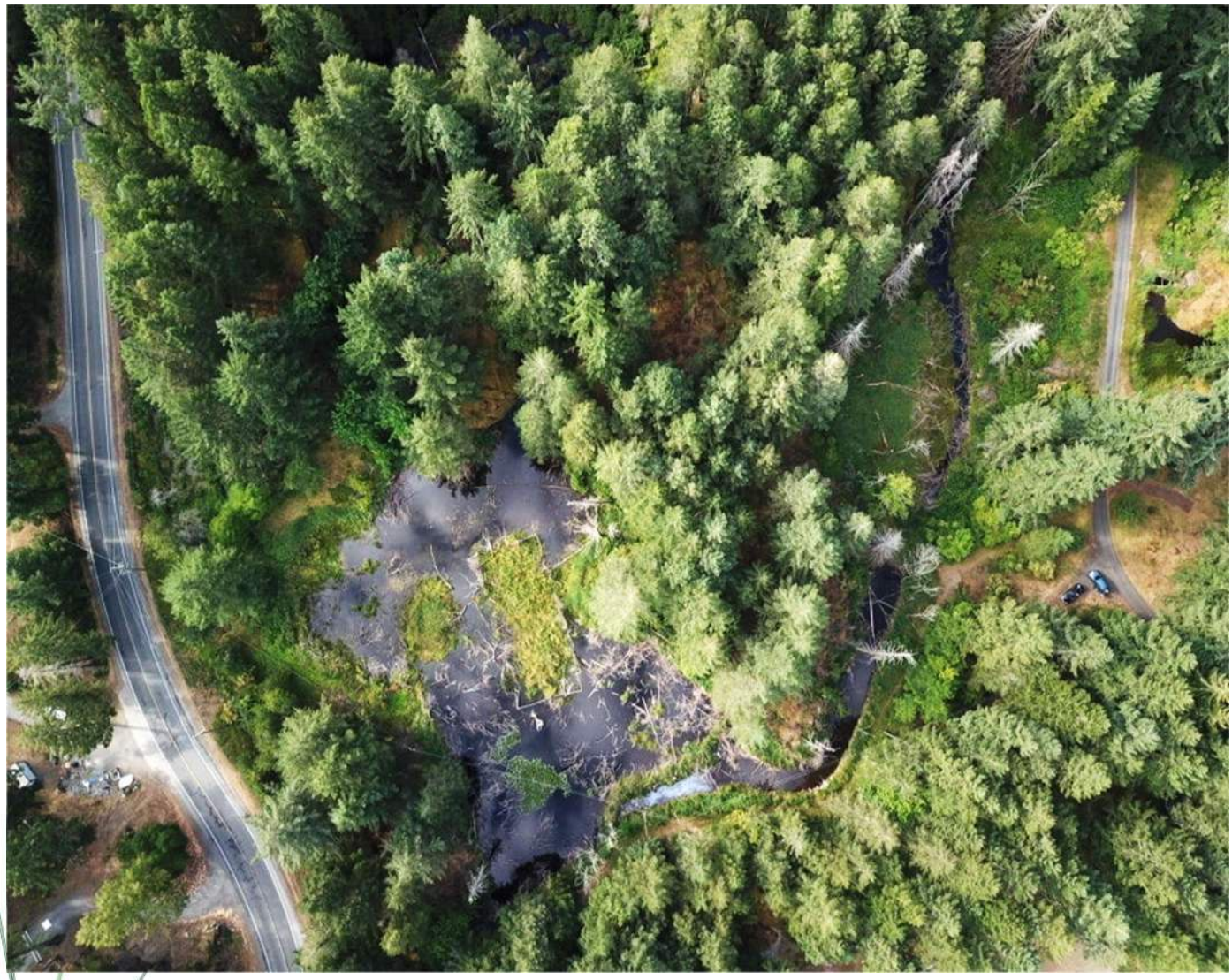
2023 Research Project

Appendices of the Beaver Wetland Assessment

A Mary Lake Nature Sanctuary Project



Prepared for Greater Victoria Greenbelt Society

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Wild Riparian Conservation: Harrison Craig, Kimberly Groome, Jaeden Jones, & Kyla Macilroy

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Table A.20. Presumptive MPN coliform bacteria test results of gas and growth within lactose broths of 10ml, 1.0ml, and 0.1ml volume of water samples from Mary Lake and Beaver Wetland water samples collected on June 28th, 2023, by Harrison Craig & Jaeden Jones then incubated for 48 hours at 37°C and assessed on July 5th, 2023, by Kyla Macilroy.

Table A.21. Presumptive test of initial most probable number method using single and double strength lactose broth with varying volumes (10, 1.0, 0.1 ml) of water sample to observe growth and gas after incubation to then determine the presumptive MPN of coliforms per 100 ml and lower/upper 95% confidence limits. Water samples taken from each water quality sampling site associated with Mary Lake Nature Sanctuary on June 28th, 2023, by Harrison Craig & Jaeden Jones then incubated for 48 hours at 37°C and assessed on July 5th, 2023, by Kyla Macilroy.

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Table A.24. Confirmed MPN total coliform bacteria test results of gas and growth within BGLB broths of varying volumes (10, 1.0, 0.1 ml) of water samples from Mary Lake and Beaver Wetland water samples collected June 28th, 2023, by Harrison Craig & Jaeden Jones then inoculated and incubated for 48 hours at 37°C on July 5th, 2023, to then be observed on July 7th, 2023, by Kyla Macilroy & Kimberly Groome.

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Table A.33. All species of shrub <2m tall found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total, vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

Table A.34. Moss and lichen species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, the lichen (L) or moss (M) abundance code, and the season observed; data collected by Wild Riparian Conservation.

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Table A.36. All aquatic species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total,

vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

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Table A.38. Species of tree found around the Beaver Wetland at Mary Lake Nature Sanctuary; showing scientific names, common names, and total number of trees, during spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023), data collected by Wild Riparian Conservation.

Table A.39. Species of tree found around the Beaver Wetland at Mary Lake Nature Sanctuary; showing scientific names, common names, and total number of trees, during spring (April 26th and May 3rd, 2023), and summer (June 21st, July 12th, and August 2nd, 2023), data collected by Wild Riparian Conservation.

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Table A.1. Water quality data from Mary Lake and Beaver Wetland showing minimum, maximum and average results compared with the 2019 and 2022 MLNS reports.

Dead Dear Creek														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.47	7.47	7.69	191.60	137.90	160.50	8.50	6.40	6.30	8.40	6.40	5.40	97.50	130
Max	7.47	8.76	8.01	191.60	225.00	218.00	8.50	14.40	20.20	8.40	21.90	11.00	162.00	147
Average	7.47	8.03	7.81	191.60	168.80	179.95	8.50	9.20	12.70	8.40	12.40	7.44	118.50	140
South Earsman														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.11	7.55	7.11	162.10	119.60	149.50	10.80	7.20	5.50	7.50	6.10	3.80	75	121
Max	7.69	8.14	8.41	185.70	140.60	176.30	17.50	19.40	19.30	10.90	22.10	11.80	131.00	142
Average	7.47	7.80	7.69	174.40	130.80	166.62	14.80	11.70	12.10	9.40	11.00	7.33	92.50	134.67
North Earsman														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.64	7.69	7.43	184.90	105.10	163.20	8.30	5.90	5.30	9.00	7.90	4.80	84.9	130
Max	8.19	8.18	7.89	210.00	184.00	183.60	17.50	15.10	19.70	12.90	21.20	11.80	98.7	148
Average	7.97	7.93	7.70	197.90	148.30	177.48	13.22	9.70	11.93	10.70	12.30	8.17	105.2	143
Dock														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.59	7.55	7.55	167.40	122.50	156.40	11.30	7.80	6.00	6.50	6.40	6.00	86.2	127
Max	8.81	8.40	7.93	200.00	405.00	180.30	23.80	20.20	21.40	10.20	18.60	11.40	283	145
Average	7.88	7.90	7.77	183.80	168.10	172.17	18.60	12.10	13.20	8.80	10.70	7.97	116.9	138.5
Lake 1 (Surface)														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.54	7.57	7.61	167.00	118.10	126.00	12.00	7.10	5.80	5.40	6.30	5.30	86	129
Max	8.07	8.15	7.93	192.70	146.80	181.50	24.20	20.60	21.80	11.70	20.10	11.10	105	147

Average	7.67	7.82	7.77	180.00	133.20	164.82	18.70	12.70	13.32	8.10	11.10	7.77	95.2	139
Lake 1 (2m depth)														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.36	7.62	7.60	171.80	120.40	158.40	13.00	6.80	5.70	6.10	6.80	8.10	85.40	128.00
Max	7.98	8.04	8.23	191.20	151.00	196.90	23.20	18.80	20.40	10.20	19.50	10.80	107.00	159.00
Average	7.60	7.83	7.83	180.00	136.40	179.62	18.60	11.70	11.67	8.00	11.70	9.47	96.60	145.83
Lake 2 (Surface)														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.48	7.50	7.64	167.60	120.50	156.40	12.60	7.00	5.70	5.80	6.40	5.10	85.30	126.00
Max	7.83	8.01	7.89	191.20	142.20	180.30	23.70	20.40	21.40	10.80	20.60	11.80	101.00	145.00
Average	7.59	7.75	7.77	180.00	131.60	173.07	18.50	12.30	12.95	8.10	11.50	7.68	93.50	139.50
Lake 2 (2m depth)														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.31	7.38	7.70	167.40	116.70	156.80	11.70	6.70	5.80	6.50	6.40	6.30	83.00	126.00
Max	7.75	8.00	7.94	191.20	147.20	197.00	22.20	18.60	20.90	9.00	18.70	11.30	105.00	159.00
Average	7.54	7.69	7.79	180.40	134.60	179.72	17.90	11.40	11.67	7.50	11.10	9.35	95.60	145.17
Lake 3 (Surface)														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.39	7.38	7.54	162.10	115.80	152.40	13.40	7.40	7.20	4.70	6.30	5.70	81.60	123.00
Max	7.65	8.05	7.89	191.90	137.70	184.60	23.00	20.70	21.90	10.80	20.30	11.50	97.50	149.00
Average	7.52	7.74	7.72	177.90	128.70	173.30	19.00	12.70	15.08	7.60	10.80	8.07	91.30	139.83
Lake 3 (2m depth)														
Parameter	pH			Conductivity (us/cm)			Temp (°C)			DO (mg/L)			TDS	
Year	2019	2022	2023	2019	2022	2023	2019	2022	2023	2019	2022	2023	2022	2023
Min	7.36	7.46	7.60	163.20	117.80	153.40	12.70	7.40	5.60	5.80	6.70	6.30	83.70	125.00
Max	7.58	8.17	7.96	192.30	136.90	186.30	22.30	19.20	21.50	9.50	18.50	11.20	97.40	150.00
Average	7.45	7.74	7.78	180.40	128.50	175.55	18.40	12.00	12.38	7.30	11.30	9.22	91.20	141.52

Wetland Inlet					
Parameter	pH	Conductivity (us/cm)	Temp (°C)	DO (mg/L)	TDS
Year	2023	2023	2023	2023	2023
Min	5.70	99.70	5.10	5.30	76.60
Max	7.79	122.00	17.20	11.60	96.40
Average	7.30	111.00	10.58	7.77	88.18
Wetland Bike					
Parameter	pH	Conductivity (us/cm)	Temp (°C)	DO (mg/L)	TDS
Year	2023	2023	2023	2023	2023
Min	6.88	111.00	6.10	4.20	89.40
Max	7.34	148.10	20.50	8.90	120.00
Average	7.10	127.38	12.37	6.50	102.60
Wetland Road					
Parameter	pH	Conductivity (us/cm)	Temp (°C)	DO (mg/L)	TDS
Year	2023	2023	2023	2023	2023
Min	6.51	124.60	5.40	4.80	99.20
Max	7.44	217.00	21.20	11.20	176.00
Average	6.91	163.40	12.43	6.90	131.03
Wetland Garden					
Parameter	pH	Conductivity (us/cm)	Temp (°C)	DO (mg/L)	TDS
Year	2023	2023	2023	2023	2023
Min	6.80	120.30	5.60	3.60	97.60
Max	7.54	148.30	19.50	9.30	120.00
Average	7.08	132.46	11.93	6.33	107.26
Wetland Outlet					
Parameter	pH	Conductivity (us/cm)	Temp (°C)	DO (mg/L)	TDS
Year	2023	2023	2023	2023	2023
Min	7.45	96.30	5.50	4.40	77.60
Max	7.78	126.30	19.10	10.80	102.00
Average	7.57	111.75	11.53	7.17	90.20

Table A.2. Water quality sampling data from Mary Lake on February 7th, 2023, surface level sampling only, and Beaver Wetland sample sites

Mary Lake Nature Sanctuary Water Sampling Data							
Date: Feb 7th 2023							
Assesors: Harrison, Jaeden							
Site	Time	Temp (C)	Conductivity (µS/cm)	pH	TDS (ppm)	DO (%)	DO (mg/L)
Lake 1	**10:55**	**5.7**	**160**	**7.92**	**130.1**	**18.04**	**11.3**
Lake 2	10:45	5.7	150.5	8.14	121	18.9	10.5
Lake 3	**10:34**	**5.8**	**178.1**	**8.5**	**125**	**19.1**	**10.8**
DD Creak	11:02	6.2	152.2	7.73	121	17	9.7
Dock	**11:11**	**6.6**	**153.1**	**7.79**	**122**	**17.9**	**9.5**
NE Creek	11:20	6.3	147.8	6.94	120	16.3	9.9
SE Creek	**11:31**	**6.1**	**158.4**	**7.2**	**128**	**19.5**	**11.6**
WL-Inlet	12:19	7.8	108.5	5.98	87.5	21.5	9.6
WL-Bike	**11:53**	**7.2**	**111**	**6.52**	**89.6**	**17.2**	**9.8**
WL-Road	12:03	7.2	144.1	5.87	116	12.9	7.5
WL-Garden	**12:43**	**6.8**	**103.4**	**6.71**	**83.5**	**18.9**	**11.1**
WL-Outlet	12:29	7.2	117.6	6.41	96.2	20.7	11.6

Table A.3. Water quality sampling data from Mary Lake on February 21st, from surface and 2m down, and the Beaver Wetland sites.

Mary Lake Nature Sanctuary Water Sampling Data							
Date: February 21, 2023							
Assesors: Kyla, Jaeden							
Site	Time	Temp (C)	Conductivity (µS/cm)	pH	TDS (ppm)	DO (%)	DO (mg/L)
Lake 1 Surface	11:30	5.8	159.8	7.8	129.0	19.1	11.1
Lake 1 (2m)	**11:38**	**5.7**	**158.4**	**7.6**	**128.0**	**17.6**	**10.8**
Lake 2 Surface	11:44	5.7	156.4	7.7	126.0	19.5	11.8
Lake 2 (2m)	**11:48**	**5.8**	**156.8**	**7.7**	**126.0**	**18.3**	**11.3**
Lake 3 Surface	11:58	5.8	152.4	7.7	123.0	19.6	11.5
Lake 3 (2m)	**12:05**	**5.6**	**153.4**	**7.6**	**125.0**	**19.8**	**10.9**
DD Creak	11:21	6.3	160.5	7.8	130.0	18.8	11.0
Dock	**12:30**	**6.0**	**156.4**	**7.7**	**127.0**	**19.7**	**11.4**
NE Creek	12:22	5.8	163.2	7.8	130.0	19.6	11.6
SE Creek	**2:25**	**5.5**	**149.5**	**7.7**	**121.0**	**19.8**	**11.8**
WL-Inlet	2:11	5.7	103.3	5.7	83.4	19.0	11.6
WL-Bike	**1:56**	**6.1**	**111.0**	**6.9**	**89.4**	**14.4**	**8.9**
WL-Road	1:49	6.6	167.4	6.7	135.0	16.4	11.2
WL-Garden	**1:37**	**5.7**	**125.8**	**6.8**	**102.0**	**17.2**	**8.5**
WL-Outlet	1:26	5.5	104.0	7.7	84.5	17.9	10.8

Table A.4. Water quality sampling data from Mary Lake on April 4th, 2023, from surface and 2m down, and the Beaver Wetland sites.

Mary Lake Nature Sanctuary Water Sampling Data							
Date: April 4/23							
Assesors: Jaeden, Harrison							
Site	Time	Temp (C)	Conductivity (µS/cm)	pH	TDS (ppm)	DO (%)	DO (mg/L)
Lake 1 Surface	9:55	6.6	126	7.78	140	15.6	9.3
Lake 1 (2m)	**9:55**	**6.4**	**174.4**	**7.7**	**141**	**15.9**	**9**
Lake 2 Surface	9:10	6.5	177	7.89	143	14.1	7.7
Lake 2 (2m)	**9:15**	**6.1**	**173.3**	**7.88**	**140**	**17.1**	**10.3**
Lake 3 Surface	9:30	7.2	184.6	7.8	149	15.9	8.4
Lake 3 (2m)	**9:30**	**7.2**	**170.1**	**7.96**	**137**	**19.2**	**11.2**
DD Creak	10:20	6.8	174.9	7.71	139	13.8	7.9
Dock	**10:03**	**6.6**	**173.8**	**7.77**	**140**	**15.1**	**8.5**
NE Creek	9:40	5.3	179.8	7.89	146	19.6	11.8
SE Creek	**11:50**	**7.4**	**170.9**	**7.72**	**138**	**13.3**	**7.5**
WL-Inlet	10:53	5.1	122	7.79	94.4	14.7	8.3
WL-Bike	**11:05**	**6.1**	**148.1**	**6.88**	**120**	**14.6**	**8.3**
WL-Road	11:12	5.4	217	6.51	176	11.4	6.6
WL-Garden	**11:20**	**5.6**	**135.9**	**6.92**	**110**	**13.6**	**8**
WL-Outlet	11:43	5.5	126.3	7.58	102	12.8	7.3

Table A.5. Water quality sampling data from Mary Lake on April 19th, 2023, from surface and 2m down, and the Beaver Wetland sites.

Mary Lake Nature Sanctuary Water Sampling Data							
Date: April 19, 2023							
Assesors: Harrison and Kyla							
Site	Time	Temp (C)	Conductivity (µS/cm)	pH	TDS (ppm)	DO (%)	DO (mg/L)
Lake 1 Surface	11:41	8.4	174.8	7.69	141	16.4	8.6
Lake 1 (2m)	**11:45**	**8**	**190**	**7.74**	**155**	**15.8**	**8.7**
Lake 2 Surface	11:33	8.2	177.3	7.64	144	15.6	8.6
Lake 2 (2m)	**11:30**	**8.1**	**191.4**	**7.7**	**155**	**17.8**	**9.9**
Lake 3 Surface	11:50	9.3	171	7.71	138	16.6	8.9
Lake 3 (2m)	**11:55**	**8.7**	**186.3**	**7.71**	**150**	**15.9**	**8.1**
DD Creak	11:19	8.2	177.2	7.69	142	18.6	20.8
Dock	**11:11**	**7.8**	**175**	**7.83**	**141**	**16.1**	**8.7**
NE Creek	11:03	6.3	183.6	7.62	148	16.5	8.8
SE Creek	**10:28**	**8.7**	**174.7**	**8.41**	**141**	**14.5**	**7.9**
WL-Inlet	10:52	6.7	119.5	7.19	96.4	16.1	9.2
WL-Bike	**10:47**	**7.6**	**138.8**	**7.03**	**112**	**14.8**	**8.4**
WL-Road	10:43	7.3	197.6	6.81	158	14.6	8.1
WL-Garden	**10:39**	**7.8**	**148.3**	**7.54**	**120**	**16.9**	**9.3**
WL-Outlet	10:56	6.7	121	7.5	97.4	15.6	9
Bathing Pond	**10:23**	**8.8**	**175.6**	**8.54**	**142**	**16.4**	**7.7**

Table A.6. Water quality sampling data from Mary Lake on May 3rd, 2023, from surface and 2m down, and the Beaver Wetland sites.

Mary Lake Nature Sanctuary Water Sampling Data							
Date: May 3, 2023							
Assesors: Harrison & Jaeden							
Site	Time	Temp (C)	Conductivity (µS/cm)	pH	TDS (ppm)	DO (%)	DO (mg/L)
Lake 1 Surface	10:27	16.2	167.5	7.93	134	15.2	6.7
Lake 1 (2m)	**10:33**	**12.8**	**179**	**7.96**	**145**	**18.1**	**9.8**
Lake 2 Surface	9:59	15.6	168.6	7.83	135	15.8	7.1
Lake 2 (2m)	**10:09**	**13.1**	**178.3**	**7.94**	**145**	**19.7**	**9**
Lake 3 Surface	10:20	16.2	170.9	7.89	138	16.6	7.8
Lake 3 (2m)	**10:20**	**14.2**	**174.4**	**7.96**	**141.1**	**18.5**	**9.9**
DD Creak	9:50	14.9	168.4	7.85	136	14.2	6.3
Dock	**10:53**	**16.6**	**168.8**	**7.93**	**134**	**15**	**6.5**
NE Creek	10:45	15.3	174.1	7.85	141	15.4	7
SE Creek	**11:10**	**15.2**	**167.8**	**7.7**	**135**	**13.3**	**6.1**
WL-Inlet	9:14	12.5	112.8	7.71	91	14.1	6.6
WL-Bike	**9:20**	**13.7**	**122.9**	**7.34**	**97.8**	**10.2**	**4.8**
WL-Road	9:25	14	136.3	7.11	108	11.2	5.1
WL-Garden	**9:32**	**14.1**	**133**	**7.01**	**108**	**10.3**	**4.7**
WL-Outlet	9:05	13.3	115	7.78	92.7	13.1	6.3
Bathing Pond	**11:07**	**15.2**	**169.8**	**7.63**	**137**	**14.1**	**6.1**

Table A.7. Water quality sampling data from Mary Lake on May 17th, 2023, from surface and 2m down, and the Beaver Wetland sites.

Mary Lake Nature Sanctuary Water Sampling Data
Date: May 17
Assesors: Jaeden and Harrison

Site	Time	Temp (C)	Conductivity (µS/cm)	pH	TDS (ppm)	DO (%)	DO (mg/L)
Lake 1 Surface	10:30	21.1	179.3	7.61	143	13.5	5.6
Lake 1 (2m)	10:30	16.7	196.9	7.76	159	18.2	8.1
Lake 2 Surface	10:05	20.3	178.8	7.69	144	12.5	5.1
Lake 2 (2m)	10:05	16	197	7.75	159	20.1	9.3
Lake 3 Surface	10:20	20.8	179.1	7.54	144	14.7	6.1
Lake 3 (2m)	10:20	17.1	184.5	7.78	149	19.5	8.9
DD Creak	9:55	19.8	180.7	7.79	146	12.8	5.4
Dock	10:42	20.8	178.7	7.55	144	14.4	6
NE Creek	10:35	19.7	181.7	7.43	146	11.1	4.8
SE Creek	11:00	19.3	176.3	7.51	142	15.4	6.9
WL-Inlet	11:20	17.2	99.7	7.66	76.6	12.2	5.3
WL-Bike	11:30	20.2	125	7.12	101	9.7	4.4
WL-Road	11:39	20.1	137.5	6.93	110	11.5	4.8
WL-Garden	11:45	18.9	131.5	6.93	106	7.8	3.6
WL-Outlet	11:55	19.1	96.3	7.45	77.6	12.5	5.2
Bathing Pond	11:05	19.2	175.9	7.45	141	13.3	5.6

Table A.8. Alkalinity (mg/l) results of lake and Beaver wetland sites within Mary Lake property. Tests performed April 5th and May 17th, 2023 using potentiometric titration against 0.04M HCl.

Alkalinity Testing of Mary Lake and Wetland Sites			
Sampling Date	**April 5th**	**May 17th**	**June 28th**
Site Name	Alkalinity (mg/l)	Alkalinity (mg/l)	Alkalinity (mg/l)
Lake 1 Surface	37	37	50.62
Lake 1 Deep	38	34	47.46
Lake 2 Surface	38	36	53.79
Lake 2 Deep	37.2	39.98	50.62
Lake 3 Surface	37.4	35.8	47.46
Lake 3 Deep	38	39.98	50.62
DD Creek	38	37.8	50.62
NE Creek	37.6	37.4	44.29
SE Creek	35	35.6	41.13
Dock	38	37.98	50.62
WL - Inlet	35	38.4	37.97
WL - Outlet	31	38.6	41.13
WL - Bike	33	39	41.13
WL - Road	37.4	45	44.29
WL - Garden	27	32	37.97
Swim/BP	N/A	35	50.62

Table A.9. Phosphate and nitrate concentration data from all lake and wetland water samples collected and tested in lab using a spectrometer to find absorbance to use to find concentrations on April 5.

Nitrates and Phosphates, April 5th, 2023						
Nitrate @ 520nm				Phosphates @ 650nm		
Sample Name	Absorbance	Concentration (ppm)		Sample Name	Absorbance	Concentration (ppm)
0 ppm	0.000	0.000		0 ppm	0.000	0
1 ppm	0.069	1		0.25 ppm	0.036	0.25
2 ppm	0.119	2		0.5 ppm	0.081	0.5
3 ppm	0.163	3		1 ppm	0.144	1
4 ppm	0.167	4		2 ppm	0.163	2
Lake 1 (surface)	0.017	0.048		3 ppm	0.326	3
Lake 1 (2m)	0.017	0.048		Lake 1 (surface)	0.074	-0.008
Lake 2 (surface)	0.017	0.048		Lake 1 (2m)	0.078	-0.007
Lake 2 (2m)	0.015	0.048		Lake 2 (surface)	0.102	-0.005
Lake 3 (surface)	0.065	0.051		Lake 2 (2m)	0.075	-0.008
Lake 3 (2m)	0.016	0.048		Lake 3 (surface)	0.074	-0.008
NE Creek	0.021	0.048		Lake 3 (2m)	0.078	-0.007
SE Creek	0.066	0.051		NE Creek	0.079	-0.007
DD Creek	0.015	0.048		SE Creek	0.080	-0.007
Dock	0.015	0.048		DD Creek	0.102	-0.005
WL Inlet	0.062	0.050		Dock	0.103	-0.005
WL Outlet	0.057	0.050		WL Inlet	0.078	-0.007
WL Garden	0.058	0.050		WL Outlet	0.075	-0.008
WL Bike	0.059	0.050		WL Garden	0.083	-0.007
WL Road	0.108	0.053		WL Bike	0.084	-0.007
Note: negative values indicate below the detection limit of 0.1ppm				WL Road	0.083	-0.007

Table A.10. Phosphate and nitrate concentration data from all lake and wetland water samples collected and tested in lab using a spectrometer to find absorbance to use to find concentrations on May 17th.

Nitrates and Phosphates, May 17th, 2023					
Nitrate @ 520nm			Phosphates @ 650nm		
Sample Name	Absorbance	Concentration (ppm)	Sample Name	Absorbance	Concentration (ppm)
0 ppm	0.000	0.000	0 ppm	0.000	0
1 ppm	0.077	1.000	0.25 ppm	0.048	0.25
2 ppm	0.138	2.000	0.5 ppm	0.108	0.5
3 ppm	0.216	3.000	1 ppm	0.210	1
4 ppm	0.258	4.000	2 ppm	0.394	2
Lake 1 (surface)	0.010	0.059	3 ppm	0.546	3
Lake 1 (2m)	0.007	0.059	Lake 1 (surface	0.013	-0.009
Lake 2 (surface)	0.004	0.059	Lake 1 (2m)	0.007	-0.010
Lake 2 (2m)	0.004	0.059	Lake 2 (surface)	0.007	-0.010
Lake 3 (surface)	0.004	0.059	Lake 2 (2m)	0.008	-0.009
Lake 3 (2m)	0.001	0.059	Lake 3 (surface)	0.012	-0.009
NE Creek	0.016	0.060	Lake 3 (2m)	0.012	-0.009
SE Creek	0.023	0.060	NE Creek	0.007	-0.010
DD Creek	0.016	0.060	SE Creek	0.006	-0.010
Dock	0.017	0.060	DD Creek	0.007	-0.010
WL Inlet	0.011	0.059	Dock	0.013	-0.008
WL Outlet	0.015	0.060	WL Inlet	0.004	-0.010
WL Garden	0.009	0.059	WL Outlet	0.007	-0.0100155
WL Bike	0.014	0.060	WL Garden	0.001	-0.0111165
WL Road	0.011	0.059	WL Bike	0.007	-0.0100155
Bathing Pond	0.018	0.060	WL Road	0.011	-0.0092815
Note: negative values indicate below the detection limit			Bathing Pond	0.006	-0.010199

Table A.11. Phosphate and nitrate concentration data from all lake and wetland water samples collected and tested in lab using a spectrometer to find absorbance to use to find concentrations on June 28th.

Nitrates and Phosphates, June 28th, 2023					
Nitrate @ 520nm				Phosphate @ 650nm	
Sample Name	Absorbance	Concentration (ppm)		Sample	Absorbance	Concentration (ppm)
0 ppm	0	0		0 ppm	0	0
1 ppm	0.069	1		0.25 ppm	0.045	0.25
2 ppm	0.139	2		0.5 ppm	0.106	0.5
3 ppm	0.281	3		1 ppm	0.219	1
4 ppm	0.244	4		2 ppm	0.419	2
Lake 1 (surface)	0.02	0.089		3 ppm	0.638	3
Lake 1 (2m)	0.018	0.088		Lake 1 (surface)	0.006	0.003
Lake 2 (surface)	0.018	0.088		Lake 1 (2m)	0.006	0.003
Lake 2 (2m)	0.004	0.087		Lake 2 (surface)	0.006	0.003
Lake 3 (surface)	0.018	0.088		Lake 2 (2m)	0.004	0.002
Lake 3 (2m)	0.019	0.089		Lake 3 (surface)	0.007	0.003
NE Creek	0.022	0.089		Lake 3 (2m)	0.007	0.003
SE Creek	0.025	0.089		NE Creek	0.006	0.003
DD Creek	0.027	0.089		SE Creek	0.017	0.005
Dock	0.021	0.089		DD Creek	0.002	0.002
WL Inlet	0.03	0.089		Dock	0.007	0.003
WL Outlet	0.027	0.089		WL Inlet	0.004	0.002
WL Garden	0	0.087		WL Outlet	0.012	0.004
WL Bike	0.024	0.089		WL Garden	0.012	0.004
WL Road	0.027	0.089		WL Bike	0	0.002
Bathing Pond	0.001	0.087		WL Road	0.015	0.005
				Bathing Pond	0.014	0.005

Table A.12. Membrane filtration results using m-FC agar plates to determine fecal coliforms per 100ml of water sample collected from Mary Lake and Beaver Wetland by Harrison Craig & Jaeden Jones on May 17th, 2023. Plate colony counts of diluted (10^{-1}) and undiluted (10^{0}) plates performed May 18th, 2023, by Wild Riparian Conservation.

Site ID	Dilution Factor	Plate Count	Fecal coliforms/100ml
Lake 1	Undiluted	1	~1
	Diluted	0	
Lake 2	Undiluted	0	<1
	Diluted	0	
Lake 3	Undiluted	0	<1
	Diluted	0	
Dock	Undiluted	1	~1
	Diluted	0	
DD Creek	Undiluted	0	<1
	Diluted	0	
NE Creek	Undiluted	6	~6
	Diluted	0	
SE Creek	Undiluted	3	~3
	Diluted	0	
WL-Inlet	Undiluted	32	32
	Diluted	0	
WL-Bike	Undiluted	10	~10
	Diluted	1	
WL-Garden	Undiluted	4	~4
	Diluted	1	
WL-Road	Undiluted	12	~12
	Diluted	0	
WL-Outlet	Undiluted	55	48
	Diluted	4	
Swim/BP	Undiluted	0	<1
	Diluted	0	
Calculation:	**# of fecal or total coliforms per 100ml = # of fecal coliform colonies x 1/dilution filtered**		
Water Quality Standards in British Columbia			
Recreational Water Quality Standards	**<200 coliforms/100ml**	**Drinking Water Quality Standards**	**1 coliform/100ml**
~ Estamate			

Table A.13. Membrane filtration results using m-FC agar plates to determine fecal coliforms per 100ml of water sample collected from Mary Lake and Beaver Wetland by Harrison Craig & Jaeden Jones on June 28, 2023. Plate colony counts of diluted (10^{-1}) and undiluted (10^{0}) plates performed June 29, 2023, by Kyla Macilroy.

Site ID	Dilution Factor	Plate Count	Fecal coliforms/100ml
Lake 1	Undiluted	0	<1
	Diluted	0	
Lake 2	Undiluted	7	~7
	Diluted	0	
Lake 3	Undiluted	1	~1
	Diluted	0	
Dock	Undiluted	2	~2
	Diluted	0	
DD Creek	Undiluted	2	~2
	Diluted	0	
NE Creek	Undiluted	6	~6
	Diluted	0	
SE Creek	Undiluted	57	57
	Diluted	6	
WL-Inlet	Undiluted	21	21
	Diluted	6	
WL-Bike	Undiluted	3	~3
	Diluted	0	
WL-Garden	Undiluted	5	~5
	Diluted	0	
WL-Road	Undiluted	2	~2
	Diluted	1	
WL-Outlet	Undiluted	107	99
	Diluted	9	
Swim/BP	Undiluted	6	~6
	Diluted	1	
Calculation:	**# of fecal or total coliforms per 100ml = # of fecal coliform colonies x 1/dilution filtered**		
Water Quality Standards in British Columbia			
Recreational Water Quality Standards	**<200 coliforms/100ml**	**Drinking Water Quality Standards**	**1 coliform/100ml**
~ Estamate			

Table A.14. Presumptive MPN coliform bacteria test results of gas and growth within lactose broths of 10ml, 1.0ml, and 0.1ml volume of water samples from Mary Lake and Beaver Wetland water samples collected May 17th, 2023, by Harrison Craig & Jaeden Jones. Incubated for 48 hours at 37°C and assessed on May 23rd, 2023, by Wild Riparian Conservation.

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Lake 1	1	10	Present	Positive
Lake 1	2	10	Present	Positive
Lake 1	3	10	Present	Positive
Lake 1	1	1	Absent	Negative
Lake 1	2	1	Absent	Negative
Lake 1	3	1	Absent	Negative
Lake 1	1	0.1	Absent	Negative
Lake 1	2	0.1	Absent	Negative
Lake 1	3	0.1	Absent	Negative
Lake 2	1	10	Present	Positive
Lake 2	2	10	Present	Positive
Lake 2	3	10	Present	Positive
Lake 2	1	1	Absent	Negative
Lake 2	2	1	Absent	Negative
Lake 2	3	1	Absent	Negative
Lake 2	1	0.1	Absent	Negative
Lake 2	2	0.1	Absent	Negative
Lake 2	3	0.1	Absent	Negative
Lake 3	1	10	Present	Positive
Lake 3	2	10	Present	Positive
Lake 3	3	10	Present	Positive
Lake 3	1	1	Absent	Negative
Lake 3	2	1	Absent	Negative
Lake 3	3	1	Absent	Negative
Lake 3	1	0.1	Absent	Negative
Lake 3	2	0.1	Absent	Negative
Lake 3	3	0.1	Absent	Negative
Dock	1	10	Present	Positive
Dock	2	10	Present	Positive
Dock	3	10	Present	Positive
Dock	1	1	Absent	Negative
Dock	2	1	Present	Positive

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Dock	3	1	Absent	Negative
Dock	1	0.1	Absent	Negative
Dock	2	0.1	Absent	Negative
Dock	3	0.1	Absent	Negative
DD Creek	1	10	Present	Positive
DD Creek	2	10	Present	Positive
DD Creek	3	10	Present	Positive
DD Creek	1	1	Absent	Negative
DD Creek	2	1	Absent	Negative
DD Creek	3	1	Absent	Negative
DD Creek	1	0.1	Absent	Negative
DD Creek	2	0.1	Absent	Negative
DD Creek	3	0.1	Absent	Negative
NE Creek	1	10	Present	Positive
NE Creek	2	10	Present	Positive
NE Creek	3	10	Present	Positive
NE Creek	1	1	Present	Positive
NE Creek	2	1	Absent	Negative
NE Creek	3	1	Present	Positive
NE Creek	1	0.1	Absent	Negative
NE Creek	2	0.1	Absent	Negative
NE Creek	3	0.1	Absent	Negative
SE Creek	1	10	Present	Positive
SE Creek	2	10	Present	Positive
SE Creek	3	10	Present	Positive
SE Creek	1	1	Absent	Negative
SE Creek	2	1	Absent	Negative
SE Creek	3	1	Present	Positive
SE Creek	1	0.1	Absent	Negative
SE Creek	2	0.1	Absent	Negative
SE Creek	3	0.1	Absent	Negative
Swim/BP	1	10	Present	Positive
Swim/BP	2	10	Present	Positive
Swim/BP	3	10	Absent	Negative
Swim/BP	1	1	Absent	Negative
Swim/BP	2	1	Absent	Negative
Swim/BP	3	1	Absent	Negative

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Swim/BP	1	0.1	Absent	Negative
Swim/BP	2	0.1	Absent	Negative
Swim/BP	3	0.1	Absent	Negative
WL-Inlet	1	10	Present	Positive
WL-Inlet	2	10	Present	Positive
WL-Inlet	3	10	Present	Positive
WL-Inlet	1	1	Present	Positive
WL-Inlet	2	1	Present	Positive
WL-Inlet	3	1	Present	Positive
WL-Inlet	1	0.1	Absent	Negative
WL-Inlet	2	0.1	Absent	Negative
WL-Inlet	3	0.1	Absent	Negative
WL-Outlet	1	10	Present	Positive
WL-Outlet	2	10	Present	Positive
WL-Outlet	3	10	Present	Positive
WL-Outlet	1	1	Present	Positive
WL-Outlet	2	1	Present	Positive
WL-Outlet	3	1	Present	Positive
WL-Outlet	1	0.1	Present	Positive
WL-Outlet	2	0.1	Present	Positive
WL-Outlet	3	0.1	Absent	Negative
WL-Garden	1	10	Present	Positive
WL-Garden	2	10	Present	Positive
WL-Garden	3	10	Present	Positive
WL-Garden	1	1	Absent	Negative
WL-Garden	2	1	Absent	Negative
WL-Garden	3	1	Present	Positive
WL-Garden	1	0.1	Absent	Negative
WL-Garden	2	0.1	Absent	Negative
WL-Garden	3	0.1	Absent	Negative
WL-Road	1	10	Present	Positive
WL-Road	2	10	Present	Positive
WL-Road	3	10	Present	Positive
WL-Road	1	1	Absent	Negative
WL-Road	2	1	Present	Positive
WL-Road	3	1	Present	Positive
WL-Road	1	0.1	Absent	Negative

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
WL-Road	2	0.1	Absent	Negative
WL-Road	3	0.1	Absent	Negative
WL-Bike	1	10	Present	Positive
WL-Bike	2	10	Present	Positive
WL-Bike	3	10	Present	Positive
WL-Bike	1	1	Present	Positive
WL-Bike	2	1	Absent	Negative
WL-Bike	3	1	Absent	Negative
WL-Bike	1	0.1	Absent	Negative
WL-Bike	2	0.1	Absent	Negative
WL-Bike	3	0.1	Present	Positive

Table A.15. Presumptive test of initial most probable number method using single and double strength lactose broth with varying volumes (10, 1.0, 0.1 ml) of water sample to observe growth and gas after incubation to then determine the presumptive MPN of coliforms per 100 ml and lower/upper 95% confidence limits. Water samples taken from each water quality sampling site associated with Mary Lake Nature Sanctuary on May 17th, 2023, then incubated for 48 hours at 37°C and assessed on May 23rd, 2023, by Wild Riparian Conservation.

Site ID	Presumptive MPN of Coliforms /100ml	95% Lower Confidence Limit of MPN	95% Upper Confidence Limit of MPN
Lake 1	23	4	120
Lake 2	23	4	120
Lake 3	23	4	120
Dock	43	7	210
DD Creek	23	4	120
NE Creek	93	15	380
SE Creek	43	7	210
Swim/BP	9	1	36
WL - Inlet	240	36	1300
WL - Outlet	1100	150	4800
WL - Garden	43	7	210
WL - Road	93	15	380
WL - Bike	75	14	230

Table A.16. Confirmed MPN fecal coliform bacteria test results of gas and growth within EC broths of varying volumes (10, 1.0, 0.1 ml) of water samples from Mary Lake and Beaver Wetland water samples collected May 17th, 2023, by Harrison Craig & Jaeden Jones. Incubated for 24 hours at 44.5°C on May 23rd, 2023, to then be observed on May 24th, 2023, by Wild Riparian Conservation.

Confirmed EC Tests (24 hours). May 24, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Lake 1	1	10	Absent	Negative
Lake 1	2	10	Absent	Negative
Lake 1	3	10	Absent	Negative
Lake 1	1	1	Absent	Negative
Lake 1	2	1	Absent	Negative
Lake 1	3	1	Absent	Negative
Lake 1	1	0.1	Absent	Negative
Lake 1	2	0.1	Absent	Negative
Lake 1	3	0.1	Absent	Negative
Lake 2	1	10	Absent	Negative
Lake 2	2	10	Absent	Negative
Lake 2	3	10	Absent	Negative
Lake 2	1	1	Absent	Negative
Lake 2	2	1	Absent	Negative
Lake 2	3	1	Absent	Negative
Lake 2	1	0.1	Absent	Negative
Lake 2	2	0.1	Absent	Negative
Lake 2	3	0.1	Absent	Negative
Lake 3	1	10	Absent	Negative
Lake 3	2	10	Absent	Negative
Lake 3	3	10	Absent	Negative
Lake 3	1	1	Absent	Negative
Lake 3	2	1	Absent	Negative
Lake 3	3	1	Absent	Negative
Lake 3	1	0.1	Absent	Negative
Lake 3	2	0.1	Absent	Negative
Lake 3	3	0.1	Absent	Negative
Dock	1	10	Absent	Negative
Dock	2	10	Absent	Negative
Dock	3	10	Absent	Negative

Confirmed EC Tests (24 hours). May 24, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Dock	1	1	Absent	Negative
Dock	2	1	Present	Positive
Dock	3	1	Absent	Negative
Dock	1	0.1	Absent	Negative
Dock	2	0.1	Absent	Negative
Dock	3	0.1	Absent	Negative
DD Creek	1	10	Absent	Negative
DD Creek	2	10	Present	Positive
DD Creek	3	10	Present	Positive
DD Creek	1	1	Absent	Negative
DD Creek	2	1	Absent	Negative
DD Creek	3	1	Absent	Negative
DD Creek	1	0.1	Absent	Negative
DD Creek	2	0.1	Absent	Negative
DD Creek	3	0.1	Absent	Negative
NE Creek	1	10	Absent	Negative
NE Creek	2	10	Present	Positive
NE Creek	3	10	Absent	Negative
NE Creek	1	1	Present	Positive
NE Creek	2	1	Absent	Negative
NE Creek	3	1	Present	Positive
NE Creek	1	0.1	Absent	Negative
NE Creek	2	0.1	Absent	Negative
NE Creek	3	0.1	Absent	Negative
SE Creek	1	10	Present	Positive
SE Creek	2	10	Absent	Negative
SE Creek	3	10	Absent	Negative
SE Creek	1	1	Absent	Negative
SE Creek	2	1	Absent	Negative
SE Creek	3	1	Absent	Negative
SE Creek	1	0.1	Absent	Negative
SE Creek	2	0.1	Absent	Negative
SE Creek	3	0.1	Absent	Negative
Swim/BP	1	10	Absent	Negative

Confirmed EC Tests (24 hours). May 24, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Swim/BP	2	10	Absent	Negative
Swim/BP	3	10	Absent	Negative
Swim/BP	1	1	Absent	Negative
Swim/BP	2	1	Absent	Negative
Swim/BP	3	1	Absent	Negative
Swim/BP	1	0.1	Absent	Negative
Swim/BP	2	0.1	Absent	Negative
Swim/BP	3	0.1	Absent	Negative
WL-Inlet	1	10	Present	Positive
WL-Inlet	2	10	Present	Positive
WL-Inlet	3	10	Present	Positive
WL-Inlet	1	1	Present	Positive
WL-Inlet	2	1	Absent	Negative
WL-Inlet	3	1	Present	Positive
WL-Inlet	1	0.1	Absent	Negative
WL-Inlet	2	0.1	Absent	Negative
WL-Inlet	3	0.1	Absent	Negative
WL-Outlet	1	10	Present	Positive
WL-Outlet	2	10	Present	Positive
WL-Outlet	3	10	Present	Positive
WL-Outlet	1	1	Present	Positive
WL-Outlet	2	1	Present	Positive
WL-Outlet	3	1	Present	Positive
WL-Outlet	1	0.1	Absent	Negative
WL-Outlet	2	0.1	Present	Positive
WL-Outlet	3	0.1	Absent	Negative
WL-Garden	1	10	Present	Positive
WL-Garden	2	10	Present	Positive
WL-Garden	3	10	Present	Positive
WL-Garden	1	1	Absent	Negative
WL-Garden	2	1	Absent	Negative
WL-Garden	3	1	Absent	Negative
WL-Garden	1	0.1	Absent	Negative
WL-Garden	2	0.1	Absent	Negative

Confirmed EC Tests (24 hours). May 24, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
WL-Garden	3	0.1	Absent	Negative
WL-Road	1	10	Present	Positive
WL-Road	2	10	Present	Positive
WL-Road	3	10	Present	Positive
WL-Road	1	1	Absent	Negative
WL-Road	2	1	Absent	Negative
WL-Road	3	1	Absent	Negative
WL-Road	1	0.1	Absent	Negative
WL-Road	2	0.1	Absent	Negative
WL-Road	3	0.1	Absent	Negative
WL-Bike	1	10	Present	Positive
WL-Bike	2	10	Absent	Negative
WL-Bike	3	10	Present	Positive
WL-Bike	1	1	Absent	Negative
WL-Bike	2	1	Absent	Negative
WL-Bike	3	1	Absent	Negative
WL-Bike	1	0.1	Absent	Negative
WL-Bike	2	0.1	Absent	Negative
WL-Bike	3	0.1	Absent	Negative

Table A.17. Confirmed most probable number test using varying volumes (10, 1.0, 0.1 ml) based on positive presumptive test (Table A.18) to observe growth and gas in EC tubes to determine fecal coliform per 100 ml and lower/upper 95% confidence limits. Water samples collected taken from each Mary Lake water quality sampling site on May 17th, 2023, then inoculated and incubated for 24 hours at 44.5°C on May 23rd, 2023, to then be observed on May 24th, 2023, by Wild Riparian Conservation.

Site ID	Confirmed MPN of Coliforms /100ml	95% Lower Confidence Limit of MPN	95% Upper Confidence Limit of MPN
Lake 1	<3	<3	<3
Lake 2	<3	<3	<3
Lake 3	<3	<3	<3
Dock	3	<0.5	13
DD Creek	9	1	36
NE Creek	11	3	36
SE Creek	4	<0.5	20
Swim/BP	<3	<3	<3
WL - Inlet	93	15	380
WL - Outlet	460	71	2400
WL - Garden	23	4	120
WL - Road	23	4	120
WL - Bike	9	1	36

Table A.18. Confirmed MPN total coliform bacteria test results of gas and growth within BGLB broths of varying volumes (10, 1.0, 0.1 ml) of water samples from Mary Lake and Beaver Wetland water samples collected May 17th, 2023, by Harrison Craig & Jaeden Jones. Incubated for 48 hours at 37°C on May 23rd, 2023, to then be observed on May 25th, 2023, by Wild Riparian Conservation.

Confirmed BGLB Tests (48 hours). May 25, 2023				
Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Lake 1	1	10	absent	Negative
Lake 1	2	10	present	Positive
Lake 1	3	10	present	Positive
Lake 1	1	1	absent	Negative
Lake 1	2	1	absent	Negative
Lake 1	3	1	absent	Negative
Lake 1	1	0.1	absent	Negative

Confirmed BGLB Tests (48 hours). May 25, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Lake 1	2	0.1	absent	Negative
Lake 1	3	0.1	absent	Negative
Lake 2	1	10	present	Positive
Lake 2	2	10	present	Positive
Lake 2	3	10	absent	Negative
Lake 2	1	1	absent	Negative
Lake 2	2	1	absent	Negative
Lake 2	3	1	absent	Negative
Lake 2	1	0.1	absent	Negative
Lake 2	2	0.1	absent	Negative
Lake 2	3	0.1	absent	Negative
Lake 3	1	10	present	Positive
Lake 3	2	10	present	Positive
Lake 3	3	10	absent	Negative
Lake 3	1	1	absent	Negative
Lake 3	2	1	absent	Negative
Lake 3	3	1	absent	Negative
Lake 3	1	0.1	absent	Negative
Lake 3	2	0.1	absent	Negative
Lake 3	3	0.1	absent	Negative
Dock	1	10	absent	Negative
Dock	2	10	present	Positive
Dock	3	10	absent	Negative
Dock	1	1	absent	Negative
Dock	2	1	present	Positive
Dock	3	1	absent	Negative
Dock	1	0.1	absent	Negative
Dock	2	0.1	absent	Negative
Dock	3	0.1	absent	Negative
DD Creek	1	10	present	Positive
DD Creek	2	10	present	Positive
DD Creek	3	10	present	Positive
DD Creek	1	1	absent	Negative
DD Creek	2	1	absent	Negative

Confirmed BGLB Tests (48 hours). May 25, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
DD Creek	3	1	absent	Negative
DD Creek	1	0.1	absent	Negative
DD Creek	2	0.1	absent	Negative
DD Creek	3	0.1	absent	Negative
NE Creek	1	10	present	Positive
NE Creek	2	10	present	Positive
NE Creek	3	10	present	Positive
NE Creek	1	1	present	Positive
NE Creek	2	1	absent	Negative
NE Creek	3	1	present	Positive
NE Creek	1	0.1	Absent	Negative
NE Creek	2	0.1	Absent	Negative
NE Creek	3	0.1	Absent	Negative
SE Creek	1	10	present	Positive
SE Creek	2	10	present	Positive
SE Creek	3	10	present	Positive
SE Creek	1	1	absent	Negative
SE Creek	2	1	absent	Negative
SE Creek	3	1	present	Positive
SE Creek	1	0.1	absent	Negative
SE Creek	2	0.1	absent	Negative
SE Creek	3	0.1	present	Positive
Swim/BP	1	10	absent	Negative
Swim/BP	2	10	present	Positive
Swim/BP	3	10	present	Positive
Swim/BP	1	1	absent	Negative
Swim/BP	2	1	absent	Negative
Swim/BP	3	1	present	Positive
Swim/BP	1	0.1	absent	Negative
Swim/BP	2	0.1	absent	Negative
Swim/BP	3	0.1	absent	Negative
WL-Inlet	1	10	present	Positive
WL-Inlet	2	10	present	Positive
WL-Inlet	3	10	present	Positive

Confirmed BGLB Tests (48 hours). May 25, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
WL-Inlet	1	1	present	Positive
WL-Inlet	2	1	absent	Negative
WL-Inlet	3	1	present	Positive
WL-Inlet	1	0.1	absent	Negative
WL-Inlet	2	0.1	absent	Negative
WL-Inlet	3	0.1	absent	Negative
WL-Outlet	1	10	present	Positive
WL-Outlet	2	10	present	Positive
WL-Outlet	3	10	present	Positive
WL-Outlet	1	1	present	Positive
WL-Outlet	2	1	present	Positive
WL-Outlet	3	1	present	Positive
WL-Outlet	1	0.1	present	Positive
WL-Outlet	2	0.1	present	Positive
WL-Outlet	3	0.1	absent	Negative
WL-Garden	1	10	present	Positive
WL-Garden	2	10	present	Positive
WL-Garden	3	10	present	Positive
WL-Garden	1	1	absent	Negative
WL-Garden	2	1	absent	Negative
WL-Garden	3	1	absent	Negative
WL-Garden	1	0.1	absent	Negative
WL-Garden	2	0.1	absent	Negative
WL-Garden	3	0.1	absent	Negative
WL-Road	1	10	present	Positive
WL-Road	2	10	present	Positive
WL-Road	3	10	present	Positive
WL-Road	1	1	absent	Negative
WL-Road	2	1	present	Positive
WL-Road	3	1	absent	Negative
WL-Road	1	0.1	absent	Negative
WL-Road	2	0.1	absent	Negative
WL-Road	3	0.1	absent	Negative
WL-Bike	1	10	present	Positive

Confirmed BGLB Tests (48 hours). May 25, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
WL-Bike	2	10	present	Positive
WL-Bike	3	10	present	Positive
WL-Bike	1	1	present	Positive
WL-Bike	2	1	absent	Negative
WL-Bike	3	1	absent	Negative
WL-Bike	1	0.1	absent	Negative
WL-Bike	2	0.1	absent	Negative
WL-Bike	3	0.1	absent	Negative

Table A.19. Confirmed most probable number test using varying volumes (10, 1.0, 0.1 ml) based on positive presumptive test (Table A.20) to observe growth and gas in BGLB tubes to determine total coliform per 100 ml and lower/upper 95% confidence limits. Water samples collected taken from each Mary Lake water quality sampling site on May 17th, 2023, then inoculated and incubated for 48 hours at 37°C on May 23rd, 2023, to then be observed on May 25th, 2023, by Wild Riparian Conservation.

Site ID	**Confirmed MPN of Coliforms /100ml**	**95% Lower Confidence Limit of MPN**	**95% Upper Confidence Limit of MPN**
Lake 1	<3	<3	<3
Lake 2	<3	<3	<3
Lake 3	<3	<3	<3
Dock	3	<0.5	13
DD Creek	9	1	36
NE Creek	11	3	36
SE Creek	4	<0.5	20
Swim/BP	<3	<3	<3
WL - Inlet	93	15	380
WL - Outlet	460	71	2400
WL - Garden	23	4	120
WL - Road	23	4	120
WL - Bike	9	1	36

Table A.20. Presumptive MPN coliform bacteria test results of gas and growth within lactose broths of 10ml, 1.0ml, and 0.1ml volume of water samples from Mary Lake and Beaver Wetland water samples collected on June 28th, 2023, by Harrison Craig & Jaeden Jones then incubated for 48 hours at 37°C and assessed on July 5th, 2023, by Kyla Macilroy.

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Lake 1	1	10	Present	Positive
Lake 1	2	10	Present	Positive
Lake 1	3	10	Present	Positive
Lake 1	1	1	Present	Positive
Lake 1	2	1	Present	Positive
Lake 1	3	1	Present	Positive
Lake 1	1	0.1	Absent	Negative
Lake 1	2	0.1	Absent	Negative
Lake 1	3	0.1	Absent	Negative
Lake 2	1	10	Present	Positive
Lake 2	2	10	Present	Positive
Lake 2	3	10	Present	Positive
Lake 2	1	1	Absent	Negative
Lake 2	2	1	Absent	Negative
Lake 2	3	1	Present	Positive
Lake 2	1	0.1	Absent	Negative
Lake 2	2	0.1	Absent	Negative
Lake 2	3	0.1	Absent	Negative
Lake 3	1	10	Present	Positive
Lake 3	2	10	Present	Positive
Lake 3	3	10	Present	Positive
Lake 3	1	1	Absent	Negative
Lake 3	2	1	Present	Positive
Lake 3	3	1	Present	Positive
Lake 3	1	0.1	Absent	Negative
Lake 3	2	0.1	Absent	Negative
Lake 3	3	0.1	Absent	Negative
Dock	1	10	Present	Positive
Dock	2	10	Present	Positive
Dock	3	10	Present	Positive
Dock	1	1	Present	Positive
Dock	2	1	Present	Positive

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Dock	3	1	Present	Positive
Dock	1	0.1	Absent	Negative
Dock	2	0.1	Absent	Negative
Dock	3	0.1	Absent	Negative
DD Creek	1	10	Present	Positive
DD Creek	2	10	Present	Positive
DD Creek	3	10	Present	Positive
DD Creek	1	1	Present	Positive
DD Creek	2	1	Present	Positive
DD Creek	3	1	Present	Positive
DD Creek	1	0.1	Absent	Negative
DD Creek	2	0.1	Absent	Negative
DD Creek	3	0.1	Absent	Negative
NE Creek	1	10	Present	Positive
NE Creek	2	10	Present	Positive
NE Creek	3	10	Present	Positive
NE Creek	1	1	Present	Positive
NE Creek	2	1	Present	Positive
NE Creek	3	1	Present	Positive
NE Creek	1	0.1	Present	Positive
NE Creek	2	0.1	Present	Positive
NE Creek	3	0.1	Present	Positive
SE Creek	1	10	Present	Positive
SE Creek	2	10	Present	Positive
SE Creek	3	10	Present	Positive
SE Creek	1	1	Present	Positive
SE Creek	2	1	Present	Positive
SE Creek	3	1	Present	Positive
SE Creek	1	0.1	Absent	Negative
SE Creek	2	0.1	Absent	Negative
SE Creek	3	0.1	Absent	Negative
Swim/BP	1	10	Present	Positive
Swim/BP	2	10	Present	Positive
Swim/BP	3	10	Present	Positive
Swim/BP	1	1	Absent	Negative
Swim/BP	2	1	Absent	Negative

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Swim/BP	3	1	Absent	Negative
Swim/BP	1	0.1	Absent	Negative
Swim/BP	2	0.1	Absent	Negative
Swim/BP	3	0.1	Absent	Negative
WL-Inlet	1	10	Present	Positive
WL-Inlet	2	10	Present	Positive
WL-Inlet	3	10	Present	Positive
WL-Inlet	1	1	Present	Positive
WL-Inlet	2	1	Present	Positive
WL-Inlet	3	1	Present	Positive
WL-Inlet	1	0.1	Absent	Negative
WL-Inlet	2	0.1	Absent	Negative
WL-Inlet	3	0.1	Absent	Negative
WL-Outlet	1	10	Present	Positive
WL-Outlet	2	10	Present	Positive
WL-Outlet	3	10	Present	Positive
WL-Outlet	1	1	Absent	Negative
WL-Outlet	2	1	Present	Positive
WL-Outlet	3	1	Present	Positive
WL-Outlet	1	0.1	Absent	Negative
WL-Outlet	2	0.1	Absent	Negative
WL-Outlet	3	0.1	Absent	Negative
WL-Garden	1	10	Present	Positive
WL-Garden	2	10	Present	Positive
WL-Garden	3	10	Present	Positive
WL-Garden	1	1	Absent	Negative
WL-Garden	2	1	Absent	Negative
WL-Garden	3	1	Absent	Negative
WL-Garden	1	0.1	Absent	Negative
WL-Garden	2	0.1	Absent	Negative
WL-Garden	3	0.1	Absent	Negative
WL-Road	1	10	Present	Positive
WL-Road	2	10	Present	Positive
WL-Road	3	10	Present	Positive
WL-Road	1	1	Absent	Negative
WL-Road	2	1	Absent	Negative
WL-Road	3	1	Present	Positive

Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
WL-Road	1	0.1	Absent	Negative
WL-Road	2	0.1	Absent	Negative
WL-Road	3	0.1	Absent	Negative
WL-Bike	1	10	Present	Positive
WL-Bike	2	10	Present	Positive
WL-Bike	3	10	Present	Positive
WL-Bike	1	1	Present	Positive
WL-Bike	2	1	Present	Positive
WL-Bike	3	1	Present	Positive
WL-Bike	1	0.1	Absent	Negative
WL-Bike	2	0.1	Absent	Negative
WL-Bike	3	0.1	Absent	Negative

Table A.21. Presumptive test of initial most probable number method using single and double strength lactose broth with varying volumes (10, 1.0, 0.1 ml) of water sample to observe growth and gas after incubation to then determine the presumptive MPN of coliforms per 100 ml and lower/upper 95% confidence limits. Water samples taken from each water quality sampling site associated with Mary Lake Nature Sanctuary on June 28th, 2023, by Harrison Craig & Jaeden Jones then incubated for 48 hours at 37°C and assessed on July 5th, 2023, by Kyla Macilroy.

Site ID	Presumptive MPN of Coliforms /100ml	95% Lower Confidence Limit of MPN	95% Upper Confidence Limit of MPN
Lake 1	240	36	1300
Lake 2	43	7	210
Lake 3	93	15	380
Dock	240	36	1300
DD Creek	240	36	1300
NE Creek	>2400	>2400	>2400
SE Creek	240	36	1300
Swim/BP	23	4	120
WL - Inlet	240	36	1300
WL - Outlet	93	15	380
WL - Garden	23	4	120
WL - Road	43	7	210
WL - Bike	240	36	1300

Table A.22. Fecal MPN coliform bacteria test results of gas and growth within EC broths of varying volumes (10, 1.0, 0.1 ml) of water samples from Mary Lake and Beaver Wetland water samples collected June 28th, 2023, by Harrison Craig & Jaeden Jones then inoculated and incubated for 24 hours at 44.5°C on July 5th, 2023, to then be observed on July 6th, 2023, by Kyla Macilroy.

Confirmed EC Tests (24 hours). July 6, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Lake 1	1	10	Absent	Negative
Lake 1	2	10	Present	Positive
Lake 1	3	10	Absent	Negative
Lake 1	1	1	Absent	Negative
Lake 1	2	1	Absent	Negative
Lake 1	3	1	Absent	Negative
Lake 1	1	0.1	Absent	Negative
Lake 1	2	0.1	Absent	Negative
Lake 1	3	0.1	Absent	Negative
Lake 2	1	10	Present	Positive
Lake 2	2	10	Present	Positive
Lake 2	3	10	Present	Positive
Lake 2	1	1	Absent	Negative
Lake 2	2	1	Absent	Negative
Lake 2	3	1	Present	Positive
Lake 2	1	0.1	Absent	Negative
Lake 2	2	0.1	Absent	Negative
Lake 2	3	0.1	Absent	Negative
Lake 3	1	10	Present	Positive
Lake 3	2	10	Absent	Negative
Lake 3	3	10	Absent	Negative
Lake 3	1	1	Absent	Negative
Lake 3	2	1	Absent	Negative
Lake 3	3	1	Absent	Negative
Lake 3	1	0.1	Absent	Negative
Lake 3	2	0.1	Absent	Negative
Lake 3	3	0.1	Absent	Negative
Dock	1	10	Absent	Negative
Dock	2	10	Present	Positive
Dock	3	10	Absent	Negative

Confirmed EC Tests (24 hours). July 6, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Dock	1	1	Absent	Negative
Dock	2	1	Absent	Negative
Dock	3	1	Absent	Negative
Dock	1	0.1	Absent	Negative
Dock	2	0.1	Absent	Negative
Dock	3	0.1	Absent	Negative
DD Creek	1	10	Present	Positive
DD Creek	2	10	Present	Positive
DD Creek	3	10	Present	Positive
DD Creek	1	1	Absent	Negative
DD Creek	2	1	Absent	Negative
DD Creek	3	1	Absent	Negative
DD Creek	1	0.1	Absent	Negative
DD Creek	2	0.1	Absent	Negative
DD Creek	3	0.1	Absent	Negative
NE Creek	1	10	Absent	Negative
NE Creek	2	10	Absent	Negative
NE Creek	3	10	Present	Positive
NE Creek	1	1	Absent	Negative
NE Creek	2	1	Absent	Negative
NE Creek	3	1	Absent	Negative
NE Creek	1	0.1	Absent	Negative
NE Creek	2	0.1	Absent	Negative
NE Creek	3	0.1	Absent	Negative
SE Creek	1	10	Present	Positive
SE Creek	2	10	Present	Positive
SE Creek	3	10	Present	Positive
SE Creek	1	1	Present	Positive
SE Creek	2	1	Present	Positive
SE Creek	3	1	Present	Positive
SE Creek	1	0.1	Absent	Negative
SE Creek	2	0.1	Absent	Negative
SE Creek	3	0.1	Absent	Negative
Swim/BP	1	10	Present	Positive

Confirmed EC Tests (24 hours). July 6, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Swim/BP	2	10	Present	Positive
Swim/BP	3	10	Present	Positive
Swim/BP	1	1	Absent	Negative
Swim/BP	2	1	Absent	Negative
Swim/BP	3	1	Absent	Negative
Swim/BP	1	0.1	Absent	Negative
Swim/BP	2	0.1	Absent	Negative
Swim/BP	3	0.1	Absent	Negative
WL-Inlet	1	10	Present	Positive
WL-Inlet	2	10	Present	Positive
WL-Inlet	3	10	Present	Positive
WL-Inlet	1	1	Absent	Negative
WL-Inlet	2	1	Present	Positive
WL-Inlet	3	1	Present	Positive
WL-Inlet	1	0.1	Absent	Negative
WL-Inlet	2	0.1	Absent	Negative
WL-Inlet	3	0.1	Absent	Negative
WL-Outlet	1	10	Present	Positive
WL-Outlet	2	10	Present	Positive
WL-Outlet	3	10	Present	Positive
WL-Outlet	1	1	Absent	Negative
WL-Outlet	2	1	Present	Positive
WL-Outlet	3	1	Present	Positive
WL-Outlet	1	0.1	Absent	Negative
WL-Outlet	2	0.1	Absent	Negative
WL-Outlet	3	0.1	Absent	Negative
WL-Garden	1	10	Present	Positive
WL-Garden	2	10	Present	Positive
WL-Garden	3	10	Absent	Negative
WL-Garden	1	1	Absent	Negative
WL-Garden	2	1	Absent	Negative
WL-Garden	3	1	Absent	Negative
WL-Garden	1	0.1	Absent	Negative
WL-Garden	2	0.1	Absent	Negative

Confirmed EC Tests (24 hours). July 6, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
WL-Garden	3	0.1	Absent	Negative
WL-Road	1	10	Present	Positive
WL-Road	2	10	Present	Positive
WL-Road	3	10	Present	Positive
WL-Road	1	1	Absent	Negative
WL-Road	2	1	Absent	Negative
WL-Road	3	1	Present	Positive
WL-Road	1	0.1	Absent	Negative
WL-Road	2	0.1	Absent	Negative
WL-Road	3	0.1	Absent	Negative
WL-Bike	1	10	Absent	Negative
WL-Bike	2	10	Absent	Negative
WL-Bike	3	10	Present	Positive
WL-Bike	1	1	Absent	Negative
WL-Bike	2	1	Absent	Negative
WL-Bike	3	1	Present	Positive
WL-Bike	1	0.1	Absent	Negative
WL-Bike	2	0.1	Absent	Negative
WL-Bike	3	0.1	Absent	Negative

Table A.23. Fecal most probable number test using varying volumes (10, 1.0, 0.1 ml) based on positive presumptive test (Table A.26) to observe growth and gas in EC tubes to determine fecal coliform per 100 ml and lower/upper 95% confidence limits. Water samples collected taken from each Mary Lake water quality sampling site on June 28th, 2023, by Harrison Craig & Jaeden Jones then inoculated and incubated for 24 hours at 44.5°C on July 5th, 2023, to then be observed on July 6th, 2023, by Kyla Macilroy.

Site ID	Confirmed MPN of Coliforms /100ml	95% Lower Confidence Limit of MPN	95% Upper Confidence Limit of MPN
Lake 1	4	<0.5	20
Lake 2	43	7	210
Lake 3	4	<0.5	20
Dock	4	<0.5	20
DD Creek	23	4	120
NE Creek	4	<0.5	20
SE Creek	240	36	1300
Swim/BP	23	4	120
WL - Inlet	93	15	380
WL - Outlet	93	15	380
WL - Garden	9	1	36
WL - Road	43	7	210
WL - Bike	7	1	23

Table A.24. Confirmed MPN total coliform bacteria test results of gas and growth within BGLB broths of varying volumes (10, 1.0, 0.1 ml) of water samples from Mary Lake and Beaver Wetland water samples collected June 28th, 2023, by Harrison Craig & Jaeden Jones then inoculated and incubated for 48 hours at 37°C on July 5th, 2023, to then be observed on July 7th, 2023, by Kyla Macilroy & Kimberly Groome.

Confirmed BGLB Tests (48 hours). July 7, 2023				
Site ID	Test Tube Number	Concentration (ml)	Bubbles (present/absent)	Results (positive/negative)
Lake 1	1	10	Present	Positive
Lake 1	2	10	Present	Positive
Lake 1	3	10	Present	Positive
Lake 1	1	1	Present	Positive
Lake 1	2	1	Present	Positive
Lake 1	3	1	Absent	Negative
Lake 1	1	0.1	Absent	Negative
Lake 1	2	0.1	Absent	Negative
Lake 1	3	0.1	Absent	Negative

Confirmed BGLB Tests (48 hours). July 7, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
Lake 2	1	10	Present	Positive
Lake 2	2	10	Present	Positive
Lake 2	3	10	Present	Positive
Lake 2	1	1	Absent	Negative
Lake 2	2	1	Absent	Negative
Lake 2	3	1	Present	Positive
Lake 2	1	0.1	Absent	Negative
Lake 2	2	0.1	Absent	Negative
Lake 2	3	0.1	Absent	Negative
Lake 3	1	10	Present	Positive
Lake 3	2	10	Present	Positive
Lake 3	3	10	Present	Positive
Lake 3	1	1	Absent	Negative
Lake 3	2	1	Present	Positive
Lake 3	3	1	Absent	Negative
Lake 3	1	0.1	Absent	Negative
Lake 3	2	0.1	Absent	Negative
Lake 3	3	0.1	Absent	Negative
Dock	1	10	Present	Positive
Dock	2	10	Present	Positive
Dock	3	10	Present	Positive
Dock	1	1	Present	Positive
Dock	2	1	Present	Positive
Dock	3	1	Present	Positive
Dock	1	0.1	Absent	Negative
Dock	2	0.1	Absent	Negative
Dock	3	0.1	Absent	Negative
DD Creek	1	10	Present	Positive
DD Creek	2	10	Present	Positive
DD Creek	3	10	Present	Positive
DD Creek	1	1	Absent	Negative
DD Creek	2	1	Present	Positive
DD Creek	3	1	Absent	Negative
DD Creek	1	0.1	Absent	Negative

Confirmed BGLB Tests (48 hours). July 7, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
DD Creek	2	0.1	Absent	Negative
DD Creek	3	0.1	Absent	Negative
NE Creek	1	10	Present	Positive
NE Creek	2	10	Present	Positive
NE Creek	3	10	Present	Positive
NE Creek	1	1	Present	Positive
NE Creek	2	1	Present	Positive
NE Creek	3	1	Present	Positive
NE Creek	1	0.1	Present	Positive
NE Creek	2	0.1	Present	Positive
NE Creek	3	0.1	Present	Positive
SE Creek	1	10	Present	Positive
SE Creek	2	10	Present	Positive
SE Creek	3	10	Present	Positive
SE Creek	1	1	Present	Positive
SE Creek	2	1	Present	Positive
SE Creek	3	1	Present	Positive
SE Creek	1	0.1	Absent	Negative
SE Creek	2	0.1	Absent	Negative
SE Creek	3	0.1	Absent	Negative
Swim/BP	1	10	Present	Positive
Swim/BP	2	10	Present	Positive
Swim/BP	3	10	Present	Positive
Swim/BP	1	1	Absent	Negative
Swim/BP	2	1	Absent	Negative
Swim/BP	3	1	Absent	Negative
Swim/BP	1	0.1	Absent	Negative
Swim/BP	2	0.1	Absent	Negative
Swim/BP	3	0.1	Absent	Negative
WL-Inlet	1	10	Present	Positive
WL-Inlet	2	10	Present	Positive
WL-Inlet	3	10	Present	Positive
WL-Inlet	1	1	Absent	Negative
WL-Inlet	2	1	Present	Positive

Confirmed BGLB Tests (48 hours). July 7, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
WL-Inlet	3	1	Present	Positive
WL-Inlet	1	0.1	Absent	Negative
WL-Inlet	2	0.1	Absent	Negative
WL-Inlet	3	0.1	Absent	Negative
WL-Outlet	1	10	Present	Positive
WL-Outlet	2	10	Present	Positive
WL-Outlet	3	10	Present	Positive
WL-Outlet	1	1	Absent	Negative
WL-Outlet	2	1	Present	Positive
WL-Outlet	3	1	Present	Positive
WL-Outlet	1	0.1	Absent	Negative
WL-Outlet	2	0.1	Absent	Negative
WL-Outlet	3	0.1	Absent	Negative
WL-Garden	1	10	Present	Positive
WL-Garden	2	10	Present	Positive
WL-Garden	3	10	Present	Positive
WL-Garden	1	1	Absent	Negative
WL-Garden	2	1	Absent	Negative
WL-Garden	3	1	Absent	Negative
WL-Garden	1	0.1	Absent	Negative
WL-Garden	2	0.1	Absent	Negative
WL-Garden	3	0.1	Absent	Negative
WL-Road	1	10	Present	Positive
WL-Road	2	10	Present	Positive
WL-Road	3	10	Present	Positive
WL-Road	1	1	Absent	Negative
WL-Road	2	1	Absent	Negative
WL-Road	3	1	Present	Positive
WL-Road	1	0.1	Absent	Negative
WL-Road	2	0.1	Absent	Negative
WL-Road	3	0.1	Absent	Negative
WL-Bike	1	10	Absent	Negative
WL-Bike	2	10	Present	Positive
WL-Bike	3	10	Present	Positive

Confirmed BGLB Tests (48 hours). July 7, 2023				
Site ID	**Test Tube Number**	**Concentration (ml)**	**Bubbles (present/absent)**	**Results (positive/negative)**
WL-Bike	1	1	Absent	Negative
WL-Bike	2	1	Absent	Negative
WL-Bike	3	1	Present	Positive
WL-Bike	1	0.1	Absent	Negative
WL-Bike	2	0.1	Absent	Negative
WL-Bike	3	0.1	Absent	Negative

Table A.25. Confirmed most probable number test using varying volumes (10, 1.0, 0.1 ml) based on positive presumptive test (Table A.28) to observe growth and gas in BGLB tubes to determine total coliform per 100 ml and lower/upper 95% confidence limits. Water samples collected taken from each Mary Lake water quality sampling site on June 28th, 2023, then inoculated and incubated for 48 hours at 37°C on July 5th, 2023, to then be observed on July 7th, 2023, by Kyla Macilroy & Kimberly Groome.

Site ID	Confirmed MPN of Coliforms /100ml	95% Lower Confidence Limit of MPN	95% Upper Confidence Limit of MPN
Lake 1	93	15	380
Lake 2	43	7	210
Lake 3	43	7	210
Dock	240	36	1300
DD Creek	43	7	210
NE Creek	>2400	>2400	>2400
SE Creek	240	36	1300
Swim/BP	23	4	120
WL - Inlet	93	15	380
WL - Outlet	93	15	380
WL - Garden	23	4	120
WL - Road	43	7	210
WL - Bike	15	3	44

Table A.26. Initial sediment sampling data, before procedure change at the Beaver Wetland at Mary Lake Nature Sanctuary.

Sediment sampling MLNS East Wetland			Scales: Mettler PC 4400 #5			
Collection Date: Feb 7th, 2023			pH: Fisherbrand accumet AB150 #25			
Analysis Date: Feb 21st, 2023			Cond: Cole Parmer Conductivity meter #4			
			XRF: Thermo Scientific Niton XRF			
Site	wet weight (g)	dry weight (g)	pH	Conductivity (µS/cm)	XRF (Y/N)	Notes
1-Inlet	339.55	37.89	5.41	148	Y	Extra 20mL of water for pH measurement
2-Bike	264.04	104.36	6.18	11	Y	
3-Road	382.33	27.58	6.46	2.16	Y	

Table A.27. Total species of Shrubs 2-10m tall found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments, data collected by Wild Riparian Conservation.

Shrubs 2-10m		
Number	Scientific Names	Common Names
1	*Alnus rubra*	Alder
2	*Cornus stolonifera*	Dogwood
3	*Holodiscus discolor*	Oceanspray
4	*Oemleria cerasiformis*	Oso berry
5	*Physocarpus capitatus*	Pacific ninebark
6	*Salix sp.*	Willow

Table A.28. All species of shrub <2m tall found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments, data collected by Wild Riparian Conservation; *Invasive Species.

Herbs/Dwarf Shrubs <2m		
Number	Scientific Names	Common Names
1	*Athyrium filix-femina*	Lady fern
2	*Achlys triphylla*	Vanilla leaf
3	*Allium canadense*	Wild garlic
4	*Amelanchier alnifolia*	Saskatoon berry
5	*Berberis vulgaris*	European bar berry
6	*Cardamine angulata*	Angled Bitter-cress
7*	*Cirsium arvense*	Creeping thistle
8	*Claytonia perfoliata*	Miners lettuce
9	*Collinsia parviflora*	Maiden Blue-eyes Mary
10*	*Cytisus scoparius*	Scotch broom
11*	*Digitalis*	Foxglove
12	*Diphasiastrum digitatum*	Ground cedar
13	*Epilobium ciliatum*	Fringed Willow herb

Number	Scientific Names	Common Names
14	*Erigeron spp.*	Daisy
15	*Erythranthe alsinoides*	Wingstem Monkey Flower
16	*Exocarpos gaudichaudii*	Small-leaved blinks
17	*Filipendula ulmaria*	Meadowsweet
18	*Galium trifidum*	Small bedstraw
19	*Gaultheria shallon*	Salal
20*	*Geranium robertianum*	Herb-Robert
21	*Geum calthifolium*	Prairie Smoke
22*	*Gymnocarpium dryopteris*	Oak Fern
23	*Heuchera micrantha*	Crevice alumroot
24	*Heuchera richardsonii*	Prairie alumroot
25*	*Hypericum perforatum*	St Johns wort
26	*Ilex aquifolium*	English holly
27*	*Iris pseudacorus*	Yellowflag iris
28*	*Kummerowia striata*	Japanese clover
29	*Lactuca muralis*	Wall lettuce
30*	*Lapsana communis*	Nipplewort
31	*Lilium sp.*	Lilly
32	*Lonicera hispidula*	Pink Honeysuckle
33	*Mahonia nervosa*	Dull Oregon-grape
34	*Mentha aquatia*	Water mint
35	*Mentha longifolia*	Mint
36	*Mertensia sp.*	Bluebells
37	*Montia parvifolia*	Little-leaf miner's lettuce
38	*Narcissus sp.*	Narcissus
39	*Nemophila parviflora*	Small-flowered Nemophila
40	*Polypodium glycyrrhiza*	Licorice fern
41	*Polystichum munitum*	Sword fern
42	*Prunella vulgaris*	Self-heal
43	*Pteridium aquilinum*	Bracken fern
44*	*Ranunculus repens*	Creeping buttercup
45	*Rosa sp.*	Rose
46	*Rubus armeniacus*	Himalayan blackberry
47*	*Rubus laciniatus*	Cutleaf blackberry
48	*Rubus pedatus*	Five-Leafed Bramble
49	*Rubus spectabilis*	Slamon berry
50	*Rubus ursinus*	Trailing blackberry
51	*Salix sp.*	Willow
52	*Sanicula crassicaulis*	Pacific Sanicle
53*	*Spiraea douglasii*	Rose Spirea
54*	*Stachys chamissonis var. cooleyae*	Coastal hedgenettle
55	*Struthiopteris spicant*	Deer fern

Number	Scientific Names	Common Names
56	*Stychys mexicana*	Hedge nettle
57*	*Symphoriocarpus albus*	Snowberry
58	*Taraxacum sp.*	Dandelion
59	*Thalictrum occidentale*	Western meadow rue
60	*Urtica dioica*	Great stinging nettle
61	*Vaccinium ovalifolium*	Oval-leafed Blueberry
62*	*Veronica americana*	American Brooklime
63	*Vinca major*	Greater periwinkle
64*	*Vincetoxicum rossicum*	Dog-Strangling Vine
65*	*Viola sp.*	Violets

Table A.29. Moss and lichen species found around Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments, data collected by Wild Riparian Conservation.

Moss/lichen		
Number	Scientific Names	Common Names
1	*Alectoria sarmentose*	Common witchs hair
2	*Aulacomnium androgynum*	Lover's Moss
3	*Bartramia pomiformis*	Apple moss
4	*Bryum pseudotriquetrum*	Tall Clustered Thread Moss
5	*Cladonia chlorophaea*	False Pixie Cup
6	*Hylocomium splendens*	Step Moss
7	*Kindbergia oregana*	Oregon beaked moss
8	*Kindbergia praelonga*	Feathermoss
9	*Platismatia sp.*	Platismatia
10	*Polytrichum juniperinum*	Juniper Haircap Moss
11	*Rhytidiadelphus loreus*	Lanky moss
12	*Rhytidiadelphus triquetrus*	Big shaggy
13	*Usnea longissima*	Old mans beard
14	*Usnea wirthii*	Methuselah's beard

Table A.30. All grass species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments, data collected by Wild Riparian Conservation; *Invasive Species.

Grass		
Number	Scientific Names	Common Names
1	*Adoxaceae sp.*	Moschatel
2*	*Leymus mollis*	Dunegrass
3*	*Anthoxanthum odoratum*	Sweet varnal grass
4	*Arrhenatherum elatius*	Bulbous Oat Grass

5	*Carex sp.*	Sedge
6	*Dactylis glomerata*	Orchard grass
7	*Festuca idahoensis*	Bunch grass
8	*Glyceria striata*	Fowl mannagrass
9	*Juncus effusus*	Soft rush
10	*Phalaris arundinacea*	Reed canary grass
11	*Poa annua*	Annual Bluegrass
12	*Polypogon viridis*	Water Beard Grass
13	*Proserpinaca sp.*	Mermaid weed
14	*Typha Latifolia*	Cattail

Table A.31. All aquatic plant species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments, data collected by Wild Riparian Conservation.

Aquatics		
Number	Scientific Names	Common Names
1	*Elodea sp.*	Elodea
2	*Equisetum arvense*	Horsetail
3	*Justicia americana*	American Water willow
4	*Lemnoideae spp.*	Duckweed
5	*Potamogeton richardsonii*	Pondweed
6	*Sparganium americanum*	Bur Reeds
7	*Veronica sp.*	Speedwell

Table A.32. Total number of invasive species present and the average % cover around the Beaver Wetland at Mary Lake Nature Sanctuary during spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023), data collected by Wild Riparian Conservation.

Invasives		
Number	Scientific Names	Common Names
1*	*Cirsium arvense*	Creeping thistle
2*	*Cytisus scoparius*	Scotch broom
3*	*Digitalis*	Foxglove
4*	*Hypericum perforatum*	St John’s wort
5*	*Iris pseudacorus*	Yellowflag iris
6*	*Kummerowia striata*	Japanese clover
7*	*Ranunculus repens*	Creeping buttercup
8*	*Rubus armeniacus*	Himalayan blackberry
9*	*Rubus laciniatus*	Cut leaf black berry
10*	*Symphoriocarpus albus*	Snowberry
11*	*Vincetoxicum rossicum*	Dog-Strangling Vine

Table A.33. All species of Shrubs 2-10m tall found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total, vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

Shrubs (2-10m)						
Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
1	*Salix sp.*	Willow	3%	3-25% unfold	3-Good	Spring
1	*Alnus rubra*	Alder	10%	4-Several leaves	3-Good	Spring
1	*Alnus rubra*	Alder	5%	5-75% unfold	3-Good	Summer
1	*Salix sp.*	Willow	5%	5-75% unfold	3-Good	Summer
2	*Alnus rubra*	Alder	5%	4-50% unfold	3-Good	Spring
2	*Alnus rubra*	Alder	5%	5-75% unfold	3-Good	Summer
2	*Salix sp.*	Willow	5%	5-75% unfold	3-Good	Summer
3	*Alnus rubra*	Alder	25%	4-50% unfold	3-Good	Spring
3	*Physocarpus capitatus*	Pacific Ninebark	1%	3-25% unfold	3-Good	Spring
3	*Alnus rubra*	Alder	7%	5-75% unfold	4-Excellent	Summer
4	*Holodiscus discolor*	Oceanspray	2%	3-25% unfold	3-Good	Spring
6	*Holodiscus discolor*	Oceanspray	3%	3-25% unfold	3-Good	Summer
9	*Cornus stolonifera*	Red osier dogwood	40%	4-50% unfold	3-Good	Spring
9	*Cornus stolonifera*	Red osier dogwood	40%	6-Full leaf out	4-Excellent	Summer
9	*Rosa sp.*	Rose	10%	1-Green bud	2-Fair	Spring
10	*Holodiscus discolor*	Oceanspray	40%	4-50% unfold	3-Good	Spring
13	*Physocarpus capitatus*	Pacific Ninebark	7%	4-50% unfold	3-Good	Spring
13	*Oemleria cerasiformis*	Oso berry	20%	5-75% unfold	4-Excellent	Spring
13	*Physocarpus capitatus*	Pacific Ninebark	50%	6-Full leaf out	3-Good	Summer
13	*Oemleria cerasiformis*	Oso berry	50%	6-Full leaf out	4-Excellent	Summer
14	*Holodiscus discolor*	Oceanspray	50%	5-75% unfold	4-Excellent	Spring
14	*Physocarpus capitatus*	Pacific ninebark	5%	5-75% unfold	3-Good	Spring
15	*Holodiscus discolor*	Oceanspray	15%	4-50% unfold	3-Good	Spring
15	*Holodiscus discolor*	Oceanspray	15%	7-yellow tips	2-Fair	Summer
16	*Holodiscus discolor*	Oceanspray	10%	4-50% unfold	2-Fair	Spring
16	*Rubus spectabilis*	Salmonberry	15%	4-50% unfold	3-Good	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
16	*Physocarpus capitatus*	Pacific ninebark	3%	6-Full leaf out	4-Excellent	Spring
17	*Holodiscus discolor*	Oceanspray	1%	5-75% unfold	3-Good	Summer
17	*Physocarpus capitatus*	Pacific ninebark	5%	5-75% unfold	3-Good	Summer
17	*Rubus spectabilis*	Salmonberry	2%	4-50% unfold	3-Good	Spring
18	*Holodiscus discolor*	Oceanspray	10%	4-50% unfold	3-Good	Spring
18	*Physocarpus capitatus*	Pacific ninebark	10%	6-Full leaf out	3-Good	Spring
18	*Physocarpus capitatus*	Pacific ninebark	10%	6-Full leaf out	4-Excellent	Summer
20	*Holodiscus discolor*	Oceanspray	15%	4-50% unfold	4-Excellent	Spring
20	*Physocarpus capitatus*	Pacific ninebark	1%	5-75% unfold	3-Good	Spring
21	*Holodiscus discolor*	Oceanspray	15%	4-50% unfold	4-Excellent	Spring
22	*Holodiscus discolor*	Oceanspray	30%	5-75% unfold	4-Excellent	Spring

Table A.34. All species of shrub <2m tall found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total, vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

Herbs/Dwarf Shrubs (<2m)						
Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
1	*Ranunculus repens*	Creeping buttercup	10%	4-Several leaves	3-Good	Spring
1	*Ranunculus repens*	Creeping buttercup	10%	5-50% developed	3-Good	Summer
1	*Rubus laciniatus*	Cutleaf black berry	20%	5-50% developed	4-Excellent	Summer
1	*Rubus ursinus*	Trailing black berry	10%	5-50% developed	4-Excellent	Summer
1	*Erigeron sp.*	Daisy	3%	5-50% developed	2-Fair	Summer
1	*Rubus ursinus*	Trailing blackberry	1%	4-50% unfold	2-Fair	Spring
1	*Filipendula ulmaria*	Meadowsweet	20%	5-50% developed	4-Excellent	Summer
1	*Taraxacum officinale*	Common Dandelion	1%	3-2-3 leaves	3-Good	Spring
2	*Rubus ursinus*	Trailing blackberry	5%	4-50% unfold	3-Good	Spring
2	*Filipendula ulmaria*	Meadowsweet	3%	3-25% unfold	3-Good	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
2	*Cornus stolonifera*	Red osier dogwood	1%	3-2-3 leaves	1-Poor	Spring
2	*Ranunculus repens*	Creeping buttercup	10%	4-Several leaves	2-Fair	Spring
2	*Equisetum arvense*	Horsetail	1%	3-2-3 leaves	2-Fair	Spring
2	*Ranunculus repens*	Creeping buttercup	10%	5-50% developed	3-Good	Summer
2	*Rubus laciniatus*	Cutleaf black berry	20%	5-50% developed	4-Excellent	Summer
2	*Allium canadense*	Wild garlic	2%	5-50% developed	3-Good	Summer
2	*Rubus ursinus*	Trailing black berry	10%	5-50% developed	4-Excellent	Summer
2	*Erigeron sp.*	Daisy	3%	5-50% developed	2-Fair	Summer
2	*Filipendula ulmaria*	Meadowsweet	20%	5-50% developed	4-Excellent	Summer
2	*Taraxacum officinale*	Common Dandelion	5%	2-First Leaf	2-Fair	Spring
3	*Symphoricarpos albus*	Snowberry	1%	5-75% unfold	4-Excellent	Spring
3	*Rubus laciniatus*	Cut leaf black berry	30%	5-75% unfold	3-Good	Spring
3	*Viola sp.*	Violets	40%	5-50% developed	3-Good	Spring
3	*Stychys mexicana*	Hedge nettle	25%	5-50% developed	4-Excellent	Spring
3	*Ranunculus repens*	Creeping buttercup	25%	6-100% developed	3-Good	Summer
3	*Erigeron sp.*	Daisy	30%	6-100% developed	4-Excellent	Summer
3	*Rubus ursinus*	Trailing black berry	10%	5-50% developed	4-Excellent	Summer
3	*Viola sp.*	Violets	20%	5-50% developed	2-Fair	Summer
3	*Prunella vulgaris*	Self-heal	5%	7-Fading start	2-Fair	Summer
4	*Rubus ursinus*	Trailing Blackberry	15%	4-Several leaves	3-Good	Spring
4	*Digitalis sp.*	Foxglove	1%	5-50% developed	4-Excellent	Spring
4	*Taraxacum sp.*	Common Dandelion	10%	3-2-3 leaves	2-Fair	Spring
4	*Erigeron sp.*	Daisy	2%	3-2-3 leaves	3-Good	Spring
4	*Vaccinium ovalifolium*	Oval Leaved-Blueberry	10%	5-50% developed	4-Excellent	Spring
4	*Sanicula crassicaulis*	Pacific Sanicle	10%	3-2-3 leaves	3-Good	Spring
4	*Mahonia nervosa*	Dull Oregon-grape	15%	5-50% developed	3-Good	Spring
4	*Athyrium filix-femina*	Lady Fern	1%	3-2-3 leaves	2-Fair	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
4	*Struthiopteris spicant*	Deer Fern	1%	4-Several leaves	1-Poor	Spring
4	*Equisetum sp.*	Giant Horsetail	1%	4-Several leaves	3-Good	Spring
4	*Polypodium glycyrrhiza*	Licorice Fern	1%	4-Several leaves	2-Fair	Spring
4	*Cirsium arvense*	Creeping thistle	1%	4-Several leaves	3-Good	Spring
4	*Gaultheria shallon*	Salal	50%	5-75% unfold	3-Good	Spring
4	*Digitalis sp.*	Foxglove	1%	6-100% developed	3-Good	Summer
4	*Rubus ursinus*	Trailing Black berry	40%	5-50% developed	4-Excellent	Summer
4	*Filipendula ulmaria*	Meadowsweet	7%	5-50% developed	4-Excellent	Summer
4	*Rubus armeniacus*	Himalayan black berry	10%	5-50% developed	4-Excellent	Summer
4	*Symphoricarpos albus*	Snowberry	15%	5-50% developed	2-Fair	Summer
4	*Gaultheria shallon*	Salal	50%	8-50%yellow	2-Fair	Summer
5	*Salix sp.*	Willow	3%	1-Green bud	2-Fair	Spring
5	*Hypericum perforatum*	St johns wort	1%	6-Full leaf out	3-Good	Spring
5	*Gaultheria shallon*	Salal	40%	6-100% developed	2-Fair	Spring
5	*Rubus laciniatus*	Cut leaf blackberry	1%	5-50% developed	3-Good	Spring
5	*Galium trifidum*	Small Bedstraw	1%	6-100% developed	3-Good	Spring
5	*Mahonia nervosa*	Oregon grape	1%	6-100% developed	3-Good	Spring
5	*Athyrium filix-femina*	Lady fern	3%	6-100% developed	3-Good	Spring
5	*Lactuca muralis*	Wall lettuce	2%	6-100% developed	3-Good	Spring
5	*Spiraea douglasii*	Rose Spirea	1%	5-50% developed	3-Good	Spring
5	*Cardamine angulata*	Angled Bitter-cress	2%	5-50% developed	3-Good	Spring
5	*Cirsium arvense*	Creeping thistle	1%	4-Several leaves	3-Good	Spring
5	*Cirsium arvense*	Creeping thistle	2%	5-50% developed	3-Good	Spring
5	*Stychys mexicana*	Hedge nettle	1%	5-50% developed	3-Good	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
5	*Cytisus scoparius*	Scotch Broom	1%	5-50% developed	3-Good	Spring
5	*Gaultheria shallon*	Salal	50%	7-Fading start	3-Good	Summer
5	*Amelanchier alnifolia*	Saskatoon berry	10%	5-50% developed	3-Good	Summer
5	*Rubus ursinus*	Trailing black berry	5%	5-50% developed	3-Good	Summer
5	*Lactuca muralis*	Wall lettuce	3%	6-100% developed	3-Good	Summer
5	*Epilobium ciliatum*	Fringed Willow herb	7%	5-50% developed	3-Good	Summer
5	*Cirsium arvense*	Creeping thistle	2%	5-50% developed	4-Excellent	Summer
5	*Athyrium filix-femina*	Lady fern	5%	6-100% developed	4-Excellent	Summer
5	*Physocarpus capitatus*	Pacific ninebark	40%	5-50% developed	4-Excellent	Summer
5	*Erigeron sp.*	Daisy	2%	6-100% developed	3-Good	Summer
5	*Mahonia nervosa*	Oregon grape	5%	5-50% developed	3-Good	Summer
5	*Symphoricarpos albus*	Snowberry	5%	5-50% developed	3-Good	Summer
5	*Erythranthe alsinoides*	Wingstem Monkey Flower	3%	6-100% developed	3-Good	Summer
6	*Cardamine angulata*	Angled Bitter-cress	2%	5-50% developed	3-Good	Spring
6	*Cirsium arvense*	Creeping thistle	5%	3-2-3 leaves	4-Excellent	Spring
6	*Nemophila parviflora*	Small-flowered Nemophila	10%	3-2-3 leaves	3-Good	Spring
6	*Digitalis sp.*	Foxglove	5%	4-Several leaves	2-Fair	Spring
6	*Geranium robertianum*	Herb-Robert	7%	5-50% developed	4-Excellent	Spring
6	*Mentha aquatia*	Water mint	10%	3-2-3 leaves	3-Good	Spring
6	*Ranunculus repens*	Creeping buttercup	5%	5-50% developed	2-Fair	Spring
6	*Galium trifidum*	Small Bedstraw	15%	4-Several leaves	3-Good	Spring
6	*Rubus pedatus*	Dwarf Bramble	10%	5-50% developed	4-Excellent	Spring
6	*Rubus armeniacus*	Himalayan blackberry	5%	4-Several leaves	3-Good	Spring
6	*Ilex aquifolium*	English Holly	2%	4-Several leaves	1-Poor	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
6	*Collinsia parviflora*	Maiden Blue-eyed Mary	30%	6-100% developed	4-Excellent	Spring
6	*Mahonia nervosa*	Dull Oregon-grape	5%	5-50% developed	4-Excellent	Spring
6	*Erythranthe alsinoides*	Wingstem Monkey Flower	15%	6-100% developed	4-Excellent	Spring
6	*Holodiscus discolor*	Oceanspray	15%	3-25% unfold	3-Good	Spring
6	*Cytisus scoparius*	Scotch Broom	5%	5-75% unfold	4-Excellent	Spring
6	*Iris pseudacorus*	Yellowflag iris	5%	6-100% developed	4-Excellent	Summer
6	*Cirsium arvense*	Creeping thistle	30%	5-50% developed	4-Excellent	Summer
6	*Geranium robertianum*	Herb-Robert	40%	6-100% developed	4-Excellent	Summer
6	*Lapsana communis*	Nipplewort	3%	6-100% developed	4-Excellent	Summer
6	*Cytisus scoparius*	Scotch Broom	5%	5-50% developed	3-Good	Summer
6	*Stychys mexicana*	Hedge nettle	5%	5-50% developed	4-Excellent	Summer
6	*Digitalis sp.*	Foxglove	1%	5-50% developed	3-Good	Summer
6	*Mahonia nervosa*	Dull Oregon grape	5%	5-50% developed	3-Good	Summer
6	*Rubus armeniacus*	Himalayan Blackberry	30%	5-50% developed	4-Excellent	Summer
6	*Geum calthifolium*	Prairie Smoke	5%	7-Fading start	3-Good	Summer
6	*Rubus pedatus*	Five-leafed Bramble	3%	6-100% developed	4-Excellent	Summer
6	*Filipendula ulmaria*	Meadowsweet	20%	5-50% developed	4-Excellent	Summer
7	*Athyrium filix-femina*	Lady fern	3%	2-First leaf	2-Fair	Spring
7	*Gaultheria shallon*	Salal	25%	6-100% developed	4-Excellent	Spring
7	*Cytisus scoparius*	Scotch Broom	5%	3-2-3 leaves	3-Good	Spring
7	*Galium trifidum*	Small bedstraw	1%	3-2-3 leaves	3-Good	Spring
7	*Symphoricarpos albus*	Snowberry	1%	3-2-3 leaves	3-Good	Spring
7	*Ranunculus repens*	Creeping buttercup	1%	3-2-3 leaves	3-Good	Spring
7	*Lonicera hispidula*	Honeysuckle	1%	3-2-3 leaves	3-Good	Spring
7	*Rubus pedatus*	Five-leafed Bramble	3%	2-First leaf	3-Good	Spring
7	*Athyrium filix-femina*	Lady fern	5%	5-50% developed	4-Excellent	Summer
7	*Spiraea douglasii*	Rose Spirea	2%	5-50% developed	4-Excellent	Summer

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
7	*Filipendula ulmaria*	Meadow sweet	25%	5-50% developed	4-Excellent	Summer
7	*Rubus pedatus*	Five-leafed Bramble	2%	4-Several leaves	3-Good	Summer
7	*Cirsium arvense*	Creeping thistle	2%	4-Several leaves	3-Good	Summer
7	*Cytisus scoparius*	Scotch Broom	5%	5-50% developed	3-Good	Summer
7	*Gaultheria shallon*	Salal	20%	5-50% developed	4-Excellent	Summer
7	*Cytisus scoparius*	Scotch Broom	5%	3-2-3 leaves	2-Fair	Spring
8	*Rosa sp.*	Rose	1%	1-Green bud	2-Fair	Spring
8	*Spiraea douglasii*	Rose Spirea	15%	5-50% developed	3-Good	Spring
8	*Symphoricarpos albus*	Snowberry	15%	5-50% developed	3-Good	Spring
8	*Gaultheria shallon*	Salal	1%	5-50% developed	1-Poor	Spring
8	*Filipendula ulmaria*	Meadow sweet	20%	5-50% developed	4-Excellent	Summer
8	*Mahonia nervosa*	Oregon grape	7%	8-50% yellow	1-Poor	Summer
8	*Rubus laciniatus*	Cut leaf blackberry	5%	5-50% developed	4-Excellent	Summer
8	*Erigeron sp.*	Daisy	10%	6-100% developed	2-Fair	Summer
8	*Kummerowia striata*	Japanese clover	15%	5-50% developed	3-Good	Summer
8	*Cirsium arvense*	Creeping thistle	10%	5-50% developed	4-Excellent	Summer
8	*Vinca major*	Greater periwinkle	50%	5-50% developed	4-Excellent	Summer
8	*Gaultheria shallon*	Salal	50%	5-50% developed	3-Good	Summer
8	*Symphoricarpos albus*	Snowberry	10%	5-50% developed	4-Excellent	Summer
8	*Rosa sp.*	Rose	15%	6-100% developed	4-Excellent	Summer
9	*Vinca major*	Greater periwinkle	50%	5-50% developed	4-Excellent	Summer
9	*Rubus ursinus*	Trailing black berry	15%	5-50% developed	3-Good	Summer
9	*Berberis vulgaris*	European bar berry	10%	5-50% developed	3-Good	Summer
10	*Rubus armeniacus*	Himalayan Blackberry	10%	4-Several leaves	2-Fair	Spring
10	*Rubus pedatus*	Five-leafed Bramble	1%	3-2-3 leaves	2-Fair	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
10	*Vinca major*	Greater Periwinkle	15%	5-50% developed	4-Excellent	Spring
10	*Mertensia sp.*	Bluebells	10%	5-50% developed	3-Good	Spring
10	*Hypericum perforatum*	St. John's Wort	10%	4-Several leaves	4-Excellent	Spring
10	*Heuchera richardsonii*	Prairie Alumroot	10%	5-50% developed	3-Good	Spring
10	*Cardamine angulata*	Angled Bitter-cress	5%	5-50% developed	4-Excellent	Spring
10	*Narcissus sp.*	Narcissus	10%	5-50% developed	4-Excellent	Spring
10	*Urtica dioica*	Great Stinging Nettle	5%	6-100% developed	3-Good	Spring
10	*Vaccinium ovalifolium*	Oval-leafed Blueberry	10%	5-75% unfold	4-Excellent	Spring
10	*Vincetoxicum rossicum*	Dog-Strangling Vine	50%	5-75% unfold	4-Excellent	Spring
10	*Rubus spectabilis*	Salmon Berry	10%	5-75% unfold	3-Good	Spring
10	*Gaultheria shallon*	Salal	2%	4-50% unfold	3-Good	Spring
10	*Hypericum perforatum*	St John’s wort	50%	6-100% developed	4-Excellent	Summer
10	*Vinca major*	Greater Periwinkle	50%	5-50% developed	4-Excellent	Summer
10	*Spiraea douglasii*	Rose Spirea	15%	6-100% developed	3-Good	Summer
11	*Mahonia nervosa*	Oregon grape	3%	5-50% developed	2-Fair	Spring
11	*Rubus ursinus*	Trailing black berry	3%	5-50% developed	2-Fair	Spring
11	*Vinca major*	Greater Periwinkle	15%	5-50% developed	3-Good	Spring
11	*Spiraea douglasii*	Rose Spirea	50%	5-75% unfold	4-Excellent	Spring
11	*Filipendula ulmaria*	Meadow sweet		6-Full leaf out	4-Excellent	Summer
12	*Gaultheria shallon*	Salal	5%	5-50% developed	3-Good	Spring
12	*Rosa sp.*	Rose	2%	5-50% developed	4-Excellent	Spring
12	*Cirsium arvense*	Creeping thistle	25%	6-100% developed	3-Good	Summer
13	*Athyrium filix-femina*	Lady fern	10%	5-50% developed	2-Fair	Spring
13	*Rubus laciniatus*	Cut leaf blackberry	10%	5-50% developed	4-Excellent	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
13	*Cytisus scoparius*	Broom	5%	5-50% developed	4-Excellent	Spring
13	*Ranunculus repens*	Creeping buttercup	1%	5-50% developed	3-Good	Spring
13	*Taraxacum officinale*	Common Dandelion	2%	6-100% developed	2-Fair	Spring
13	*Urtica dioica*	Great stinging nettle	15%	5-50% developed	3-Good	Spring
13	*Galium trifidum*	Small bedstraw	3%	4-Several leaves	3-Good	Spring
13	Geum calthifolium	Prairie Smoke	2%	4-50% unfold	3-Good	Spring
13	*Gaultheria shallon*	Salal	40%	6-100% developed	4-Excellent	Summer
13	*Cytisus scoparius*	Scotch Broom	7%	6-100% developed	3-Good	Summer
13	*Polystichum munitum*	Sword fern	5%	6-100% developed	4-Excellent	Summer
13	*Rubus ursinus*	Trailing blackberry	20%	6-100% developed	4-Excellent	Summer
13	*Ranunculus repens*	Buttercup	2%	6-100% developed	4-Excellent	Summer
13	*Erigeron sp.*	Daisy	2%	6-100% developed	3-Good	Summer
13	*Galium trifidum*	Small bedstraw	7%	5-50% developed	3-Good	Summer
13	*Urtica dioica*	Great stinging nettle	10%	6-100% developed	2-Fair	Summer
14	*Polystichum munitum*	Sword Fern	30%	5-50% developed	3-Good	Spring
14	*Urtica dioica*	Great Stinging Nettle	20%	4-Several leaves	3-Good	Spring
14	*Cardamine angulata*	Angled Bitter-cress	30%	5-50% developed	4-Excellent	Spring
14	*Athyrium filix-femina*	Lady Fern	10%	4-Several leaves	3-Good	Spring
14	*Ranunculus repens*	Creeping buttercup	5%	5-50% developed	3-Good	Spring
14	*Rubus pedatus*	Five-leafed Bramble	1%	5-50% developed	4-Excellent	Spring
14	*Exocarpos gaudichaudii*	Small-leaved Blinks	10%	2-First leaf	4-Excellent	Spring
14	*Vincetoxicum rossicum*	Dog-Strangling Vine	10%	4-50% unfold	2-Fair	Spring
14	*Gaultheria shallon*	Salal	50%	6-Full leaf out	4-Excellent	Spring
14	*Gaultheria shallon*	Salal	40%	6-100% developed	4-Excellent	Summer

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
14	*polystichum munitum*	Sword Fern	30%	6-100% developed	4-Excellent	Summer
14	*Galium trifidum*	Small bedstraw	40%	6-100% developed	4-Excellent	Summer
14	*Rubus ursinus*	Trailing blackberry	30%	5-50% developed	4-Excellent	Summer
14	*Ranunculus repens*	Buttercup	50%	6-100% developed	4-Excellent	Summer
14	*Athyrium filix-femina*	Lady Fern	15%	6-100% developed	3-Good	Summer
14	*Mahonia nervosa*	Dull Oregon grape	10%	5-50% developed	3-Good	Summer
14	*Achlys triphylla*	Vanilla leaf	1%	6-100% developed	3-Good	Summer
14	*Rosa sp.*	Rose	10%	6-100% developed	4-Excellent	Summer
14	*Urtica dioica*	Great stinging nettle	20%	6-100% developed	4-Excellent	Summer
14	*Cirsium arvense*	Creeping thistle	20%	6-100% developed	4-Excellent	Summer
15	*Galium trifidum*	Small bedstraw	40%	4-Several leaves	3-Good	Spring
15	*Urtica dioica*	Great stinging nettle	15%	5-50% developed	3-Good	Spring
15	*Athyrium filix-femina*	Lady fern	15%	5-50% developed	3-Good	Spring
15	*Gaultheria shallon*	Salal	20%	5-50% developed	3-Good	Spring
15	*Claytonia perfoliata*	Miner’s lettuce	50%	4-Several leaves	3-Good	Spring
15	*Rubus laciniatus*	Cut leaf black berry	25%	5-50% developed	3-Good	Spring
15	*Rosa sp.*	Rose	15%	5-50% developed	3-Good	Spring
15	*Cirsium arvense*	Creeping thistle	1%	5-50% developed	2-Fair	Spring
15	*Ranunculus repens*	Creeping buttercup	1%	4-Several leaves	2-Fair	Spring
15	*Diphasiastrum digitatum*	Ground cedar	2%	5-50% developed	3-Good	Spring
15	*Rubus ursinus*	Trailing blackberry	10%	5-50% developed	3-Good	Summer
15	*Rosa sp.*	Rose	10%	6-100% developed	4-Excellent	Summer
15	*Polystichum munitum*	Sword fern	25%	6-100% developed	4-Excellent	Summer

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
16	*Athyrium filix-femina*	Lady Fern	5%	4-Several leaves	2-Fair	Spring
16	*Rubus pedatus*	Five-leafed Bramble	2%	5-50% developed	3-Good	Spring
16	*Cardamine angulata*	Angled Bitter-cress	5%	5-50% developed	3-Good	Spring
16	*Rosa sp.*	Creeping buttercup	5%	4-Several leaves	3-Good	Spring
16	*Mahonia nervosa*	Dull Oregon-grape	30%	6-100% developed	4-Excellent	Spring
16	*Mahonia nervosa*	Dull Oregon-grape	20%	6-100% developed	4-Excellent	Summer
16	*Rubus pedatus*	Five-leafed Bramble	10%	5-50% developed	4-Excellent	Summer
16	*Gaultheria shallon*	Salal	5%	6-Full leaf out	4-Excellent	Spring
16	*Gaultheria shallon*	Salal	10%	5-75% unfold	4-Excellent	Summer
17	*Mahonia nervosa*	Dull Oregon-grape	40%	6-100% developed	4-Excellent	Spring
17	*Athyrium filix-femina*	Lady Fern	30%	4-Several leaves	3-Good	Spring
17	*Polystichum munitum*	Sword Fern	5%	4-Several leaves	2-Fair	Spring
17	*Rubus pedatus*	Five-leafed Bramble	2%	4-Several leaves	3-Good	Spring
17	*Gaultheria shallon*	Salal	2%	6-Full leaf out	4-Excellent	Summer
17	*Gaultheria shallon*	Salal	40%	6-Full leaf out	4-Excellent	Spring
17	*Polystichum munitum*	Sword Fern	2%	5-50% developed	4-Excellent	Summer
17	*Athyrium filix-femina*	Lady Fern	2%	5-50% developed	4-Excellent	Summer
17	*Epilobium ciliatum*	Fringed Willowherb	1%	4-Several leaves	3-Good	Summer
17	*Veronica americana*	American Brooklime	2%	4-Several leaves	3-Good	Summer
17	*Mahonia nervosa*	Dull Oregon-grape	1%	6-100% developed	4-Excellent	Summer
17	*Rosa sp.*	Bald hip Rose	1%	3-2-3 leaves	2-Fair	Summer
18	*Gaultheria shallon*	Salal	40%	5-75% unfold	3-Good	Spring
18	*Gaultheria shallon*	Salal	5%	6-Full leaf out	4-Excellent	Summer
18	*Athyrium filix-femina*	Lady Fern	10%	4-Several leaves	2-Fair	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
18	*Urtica dioica*	Great Stinging Nettle	25%	5-50% developed	4-Excellent	Spring
18	*Rubus pedatus*	Five-leafed Bramble	2%	3-2-3 leaves	3-Good	Spring
18	*Rubus armeniacus*	Himalayan Blackberry	1%	4-Several leaves	3-Good	Spring
18	*Ranunculus repens*	Creeping buttercup	2%	4-Several leaves	3-Good	Spring
18	*Spiraea douglasii*	Rose Spirea	5%	5-50% developed	4-Excellent	Summer
18	*Athyrium filix-femina*	Lady Fern	2%	5-50% developed	4-Excellent	Summer
18	*Ranunculus repens*	Creeping buttercup	2%	5-50% developed	3-Good	Summer
18	*Cirsium arvense*	Creeping thistle	2%	5-50% developed	4-Excellent	Summer
18	*Galium trifidum*	Small bedstraw	1%	5-50% developed	3-Good	Summer
19	*Rosa sp.*	Rose	5%	5-50% developed	3-Good	Spring
19	*Spiraea douglasii*	Rose Spirea	20%	5-50% developed	3-Good	Spring
19	*Gaultheria shallon*	Salal	15%	5-50% developed	2-Fair	Spring
19	*Rubus laciniatus*	Cut leaf blackberry	5%	5-50% developed	3-Good	Spring
19	*Cytisus scoparius*	Broom	10%	5-50% developed	4-Excellent	Spring
19	*Cirsium arvense*	Creeping thistle	10%	4-Several leaves	3-Good	Spring
19	*Taraxacum officinale*	Common Dandelion	2%	6-100% developed	3-Good	Spring
19	*Spiraea douglasii*	Rose Spirea	5%	5-50% developed	4-Excellent	Summer
19	*Cirsium arvense*	Creeping thistle	2%	5-50% developed	4-Excellent	Summer
20	*Athyrium filix-femina*	Lady Fern	20%	4-Several leaves	3-Good	Spring
20	*Rubus pedatus*	Five-leafed Bramble	5%	5-50% developed	3-Good	Spring
20	*Rubus armeniacus*	Himalayan Blackberry	3%	3-2-3 leaves	3-Good	Spring
20	*Ranunculus repens*	Creeping buttercup	10%	4-Several leaves	3-Good	Spring
20	*Polystichum munitum*	Sword Fern	1%	4-Several leaves	3-Good	Spring
20	*Rubus spectabilis*	Salmonberry	5%	3-25% unfold	3-Good	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
20	*Gaultheria shallon*	Salal	40%	4-50% unfold	4-Excellent	Spring
20	*Gaultheria shallon*	Salal	5%	5-75% unfold	4-Excellent	Summer
20	*Athyrium filix-femina*	Lady Fern	5%	5-50% developed	4-Excellent	Summer
20	*Spiraea douglasii*	Rose Spirea	1%	5-50% developed	3-Good	Summer
21	*Gaultheria shallon*	Salal	50%	5-50% developed	3-Good	Spring
21	*Athyrium filix-femina*	Lady fern	40%	5-50% developed	4-Excellent	Spring
21	*Ranunculus repens*	Creeping buttercup	3%	5-50% developed	3-Good	Spring
21	*Galium trifidum*	Small bedstraw	7%	5-50% developed	3-Good	Spring
21	*Lilium sp.*	Lilly	2%	5-50% developed	2-Fair	Spring
21	*Thalictrum occidentale*	Western meadow rue	2%	5-50% developed	2-Fair	Spring
21	*Geranium robertianum*	Herb-Robert	3%	5-50% developed	3-Good	Spring
21	*Rubus ursinus*	Trailing Wild Blackberry	5%	5-50% developed	3-Good	Spring
21	*Rubus laciniatus*	Cutleaf black berry	5%	5-50% developed	3-Good	Spring
21	*Gaultheria shallon*	Salal	10%	6-100% developed	4-Excellent	Summer
21	*Athyrium filix-femina*	Lady fern	5%	6-100% developed	4-Excellent	Summer
21	*Rubus armeniacus*	Himalayan Blackberry	1%	6-100% developed	4-Excellent	Summer
21	*Cytisus scoparius*	Scotch Broom	3%	5-50% developed	4-Excellent	Summer
22	*Mahonia nervosa*	Dull Oregon-grape	2%	3-2-3 leaves	3-Good	Spring
22	*Athyrium filix-femina*	Lady Fern	10%	3-2-3 leaves	3-Good	Spring
22	*Rubus armeniacus*	Himalayan Blackberry	1%	4-Several leaves	2-Fair	Spring
22	*Gymnocarpium dryopteris*	Oak Fern	5%	4-Several leaves	3-Good	Spring
22	*Cytisus scoparius*	Scotch Broom	5%	4-Several leaves	3-Good	Spring
22	*Rubus ursinus*	Trailing Wild Blackberry	5%	4-Several leaves	2-Fair	Spring
22	*Rubus spectabilis*	Salmonberry	5%	4-50% unfold	3-Good	Spring
22	*Gaultheria shallon*	Salal	40%	4-50% unfold	3-Good	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
22	*Gaultheria shallon*	Salal	20%	5-75% unfold	4-Excellent	Summer
22	*Athyrium filix-femina*	Lady Fern	5%	5-50% developed	4-Excellent	Summer
22	*Rubus armeniacus*	Himalayan Blackberry	1%	5-50% developed	4-Excellent	Summer
22	*Cytisus scoparius*	Scotch Broom	2%	5-50% developed	4-Excellent	Summer
23	Spiraea douglasii	Spirea	5%	3-2-3 leaves	3-Good	Spring
23	*Athyrium filix-femina*	Lady fern	20%	4-Several leaves	3-Good	Spring
23	Mentha longifolia	Mint	1%	5-50% developed	3-Good	Spring
23	*Galium trifidum*	Small bedstraw	5%	4-Several leaves	3-Good	Spring
23	Heuchera micrantha	Prairie alumroot	1%	4-Several leaves	3-Good	Spring
23	Montia parvifolia	Little-leaf miner's lettuce	1%	4-Several leaves	3-Good	Spring
23	*Lactuca muralis*	Wall lettuce	1%	4-Several leaves	3-Good	Spring
23	*Geranium robertianum*	Herb-Robert	1%	4-Several leaves	3-Good	Spring
23	Polypodium glycyrrhiza	Licorice fern	1%	4-Several leaves	2-Fair	Spring
23	*Rubus pedatus*	Five-leafed Bramble	20%	4-50% unfold	2-Fair	Spring
23	*Rubus pedatus*	Five-leafed Bramble	5%	5-75% unfold	4-Excellent	Summer

Table A.35. Moss and lichen species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, the lichen (L) or moss (M) abundance code, and the season observed; data collected by Wild Riparian Conservation.

Moss/lichen				
Polygon ID	Scientific Names	Names	Lichen/moss Abundance Code	Season
1	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Spring
4	*Polytrichum juniperinum*	Juniper Haircap Moss	5-Abundant: 51%+	Spring
4	*Bryum pseudotriquetrum*	Tall Clustered Thread Moss	5-Abundant: 51%+	Spring
4	*Hylocomium splendens*	Step Moss	5-Abundant: 51%+	Spring

Polygon ID	Scientific Names	Names	Lichen/moss Abundance Code	Season
4	*Aulacomnium androgynum*	Lover's Moss	5-Abundant: 51%+	Spring
4	*Rhytidiadelphus triquetrus*	Big shaggy	5-Abundant: 51%+	Summer
4	*Polytrichum juniperinum*	Juniper Haircap Moss	3-Common <20%	Summer
4	*Usnea longissima*	Old man's beard	3-Common <20%	Summer
5	*Kindbergia praelonga*	Feathermoss	4-Very Common 21-50%	Spring
5	*Usnea longissima*	Old man's beard	3-Common <20%	Spring
5	*Usnea longissima*	Old man's beard	3-Common <20%	Summer
5	*Platismatia sp.*	Platismatia	2-Ocassional ~5%	Summer
5	*Kindbergia oregana*	Oregon beaked moss	4-Very Common 21-50%	Summer
6	*Polytrichum juniperinum*	Juniper Haircap Moss	5-Abundant: 51%+	Spring
6	*Usnea wirthii*	Methuselah's beard	5-Abundant: 51%+	Spring
7	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Spring
8	*Kindbergia praelonga*	Feathermoss	3-Common <20%	Spring
8	*Usnea longissima*	Old man's beard	2-Ocassional ~5%	Spring
8	*Kindbergia praelonga*	Feathermoss	2-Ocassional ~5%	Summer
9	*Polytrichum juniperinum*	Juniper Haircap Moss	4-Very Common 21-50%	Spring
9	*Usnea longissima*	Old man's beard	3-Common <20%	Summer
10	*Rhytidiadelphus triquetrus*	Lanky moss	1-Rare ~1%	Spring
10	*Cladonia chlorophaea*	False Pixie Cup	1-Rare ~1%	Spring
10	*Usnea longissima*	Old man's beard	3-Common <20%	Summer
10	*Kindbergia praelonga*	Feathermoss	3-Common <20%	Summer
11	*Kindbergia praelonga*	Feathermoss	2-Ocassional ~5%	Spring
13	*Usnea longissima*	Old man's beard	3-Common <20%	Spring
13	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Spring
13	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Summer
13	*Usnea longissima*	Old man's beard	5-Abundant: 51%+	Summer
14	*Rhytidiadelphus loreus*	Lanky moss	3-Common <20%	Spring
14	*Usnea longissima*	Old man's beard	3-Common <20%	Spring
14	*Alectoria sarmentose*	Common Witch's Hair	3-Common <20%	Spring
14	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Summer
14	*Usnea longissima*	Old man's beard	3-Common <20%	Summer
15	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Spring
15	*Polytrichum juniperinum*	Juniper Haircap Moss	5-Abundant: 51%+	Spring
15	*Usnea longissima*	Old man's beard	5-Abundant: 51%+	Spring
15	*Bartramia pomiformis*	Apple moss	5-Abundant: 51%+	Spring

Polygon ID	Scientific Names	Names	Lichen/moss Abundance Code	Season
15	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Spring
16	*Rhytidiadelphus loreus*	Lanky moss	1-Rare ~1%	Spring
17	*Usnea longissima*	Old man's beard	1-Rare ~1%	Spring
17	*Rhytidiadelphus loreus*	Lanky moss	1-Rare ~1%	Spring
18	*Rhytidiadelphus loreus*	Lanky moss	1-Rare ~1%	Spring
19	*Kindbergia praelonga*	Feathermoss	4-Very Common 21-50%	Spring
20	*Rhytidiadelphus loreus*	Lanky moss	1-Rare ~1%	Spring
21	*Kindbergia praelonga*	Feathermoss	5-Abundant: 51%+	Spring
21	*Usnea longissima*	Old man's beard	4-Very Common 21-50%	Spring
22	*Hylocomium splendens*	Step Moss	1-Rare ~1%	Spring
23	*Kindbergia praelonga*	Feathermoss	4-Very Common 21-50%	Spring

Table A.36. All grass species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total, vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

Grass						
Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
1	*Juncus effusus*	Soft rush	50%	4-Blade development	3-Good	Spring
1	*Typha latifolia*	Bullrush	50%	5-50% blade	3-Good	Spring
1	*Arrhenatherum elatius*	Bulbous oat grass	50%	5-50% blade	3-Good	Spring
1	*Leymus mollis*	Dunegrass	50%	5-50% blade	3-Good	Spring
1	*Adoxa moschatellina*	Moschatel sp.	5%	2-First Leaf	3-Good	Spring
1	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
1	*Agrostis sp.*	Bent grass	50%	6-100% blade	4-Excellent	Summer
1	*Juncus effusus*	Soft rush	40%	5-50% blade	4-Excellent	Summer
2	*Typha latifolia*	Cattail	50%	4-Blade development	3-Good	Spring
2	*Juncus effusus*	Soft rush	20%	3-2-3 leaves	2-Fair	Spring
2	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
2	*Agrostis sp.*	Bent grass	50%	6-100% blade	4-Excellent	Summer

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
3	*Leymus mollis*	Dunegrass	50%	5-50% blade	4-Excellent	Spring
3	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
3	*Agrostis sp.*	Bent grass	50%	6-100% blade	4-Excellent	Summer
4	*Leymus mollis*	Dunegrass	50%+	6-100% blade	4-Excellent	Spring
4	*Calscape sp.*	Kellogg's Sedge	40%	5-50% blade	3-Good	Spring
4	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
4	*Agrostis sp.*	Bent grass	50%	6-100% blade	4-Excellent	Summer
5	*Juncus effusus*	Soft rush	1%	5-50% blade	3-Good	Spring
5	*Leymus mollis*	Dunegrass	40%	5-50% blade	4-Excellent	Spring
5	*Phalaris arundinacea*	Reed canary grass	50%	5-50% blade	4-Excellent	Summer
5	*Glyceria striata*	Fowl mannagrass	15%	5-50% blade	4-Excellent	Summer
6	*Calscape sp.*	Kellogg's Sedge	40%	5-50% blade	3-Good	Spring
6	*Leymus mollis*	Dunegrass	50%	5-50% blade	4-Excellent	Spring
6	*Anthoxanthum odoratum*	Sweet varnal grass	5%	5-50% blade	4-Excellent	Summer
6	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
6	*Carex sp.*	Sedge	10%	6-100% blade	4-Excellent	Summer
6	*Juncus effusus*	Soft rush	25%	6-100% blade	4-Excellent	Summer
6	*Dactylis glomerata*	Orchard grass	25%	5-50% blade	4-Excellent	Summer
7	*Juncus effusus*	Soft rush	20%	3-2-3 leaves	2-Fair	Spring
7	*Proserpinaca sp.*	Mermaid weed	3%	3-2-3 leaves	2-Fair	Spring
7	*Leymus mollis*	Dunegrass	20%	3-2-3 leaves	2-Fair	Spring
7	*Juncus effusus*	Soft rush	30%	5-50% blade	4-Excellent	Summer
7	*Leymus mollis*	Dunegrass	50%	6-100% blade	4-Excellent	Summer
8	*Leymus mollis*	Dunegrass	50%	5-50% blade	4-Excellent	Spring
9	*Leymus mollis*	Dunegrass	50%+	5-50% blade	4-Excellent	Spring
9	*Dactylis glomerata*	Orchard grass	40%	6-100% blade	4-Excellent	Summer

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
9	*Anthoxanthum odoratum*	Sweet varnal grass	20%	6-100% blade	3-Good	Summer
9	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
10	*Leymus mollis*	Dunegrass	50%+	5-50% blade	4-Excellent	Spring
10	*Dactylis glomerata*	Orchard grass	50%	6-100% blade	4-Excellent	Summer
10	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
11	*Festuca idahoensis*	Bunch grass	50%+	5-50% blade	4-Excellent	Spring
11	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
11	*Dactylis glomerata*	Orchard grass	50%	6-100% blade	4-Excellent	Summer
12	*Festuca idahoensis*	Bunch grass	50%+	5-50% blade	4-Excellent	Spring
12	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
12	*Dactylis glomerata*	Orchard grass	50%	6-100% blade	4-Excellent	Summer
13	*Festuca idahoensis*	Bunch grass	50%+	5-50% blade	4-Excellent	Spring
13	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
13	*Dactylis glomerata*	Orchard grass	50%	6-100% blade	4-Excellent	Summer
14	*Leymus mollis*	Dunegrass	50%+	5-50% blade	4-Excellent	Spring
14	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
14	*Dactylis glomerata*	Orchard grass	50%	6-100% blade	4-Excellent	Summer
15	*Leymus mollis*	Dunegrass	50%+	5-50% blade	3-Good	Spring
15	*Phalaris arundinacea*	Reed canary grass	50%	6-100% blade	4-Excellent	Summer
16	*Leymus mollis*	Dunegrass	50%+	6-100% blade	4-Excellent	Spring
16	*Poa annua*	Annual Bluegrass	5%	3-2-3 leaves	2-Fair	Spring
16	*Leymus mollis*	Dunegrass	50%	5-50% blade	4-Excellent	Summer
17	*Leymus mollis*	Dunegrass	50%+	6-100% blade	4-Excellent	Spring
17	*Poa annua*	Annual Bluegrass	5%	3-2-3 leaves	2-Fair	Spring

Polygon ID	Scientific Names	Common Names	% Cover total	Vegetation Stage	Species Vigor	Season
17	*Leymus mollis*	Dunegrass	20%	6-100% blade	4-Excellent	Summer
18	*Leymus mollis*	Dunegrass	50%+	5-50% blade	3-Good	Spring
18	*Poa annua*	Annual Bluegrass	2%	4-Blade development	2-Fair	Spring
18	*Leymus mollis*	Dunegrass	50%	6-100% blade	4-Excellent	Summer
19	*Leymus mollis*	Dunegrass	50%+	5-50% blade	4-Excellent	Spring
19	*Leymus mollis*	Dunegrass	50%	6-100% blade	4-Excellent	Summer
20	*Leymus mollis*	Dunegrass	40%	5-50% blade	3-Good	Spring
20	*Leymus mollis*	Dunegrass	50%	6-100% blade	4-Excellent	Summer
21	*Leymus mollis*	Dunegrass	50%+	5-50% blade	4-Excellent	Spring
21	*Leymus mollis*	Dune grass	50%	6-100% blade	4-Excellent	Summer
21	*Polypogon viridis*	Water Beard Grass	2%	5-50% blade	4-Excellent	Summer
22	*Leymus mollis*	Dunegrass	30%	5-50% blade	3-Good	Spring
22	*Poa annua*	Annual Bluegrass	10%	4-Blade development	2-Fair	Spring
23	*Leymus mollis*	Dunegrass	50%+	5-50% blade	3-Good	Spring
23	*Leymus mollis*	Dunegrass	50%	6-100% blade	4-Excellent	Summer

Table A.37. All aquatic plant species found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total, vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

Aquatics						
Polygon ID	Scientific Names	Names	% Cover total	Vegetation stage	Species Vigor	Season
1	*Equisetum arvense*	Horsetail	1%	3-2-3 leaves	2-Fair	Spring
1	*Justicia americana*	Willow	10%	4-Several leaves	3-Good	Spring
4	*Elodea sp.*	Elodea	10%	3-2-3 leaves	3-Good	Spring
5	*Equisetum arvense*	Horsetail	1%	5-50% developed	3-Good	Spring
7	*Galium aparine*	Catchweed	1%	4-Several leaves	2-Fair	Spring

7	*Potamogeton richardsonii*	Pondweed	1%	3-2-3 leaves	2-Fair	Spring
7	*Justicia americana*	Willow	1%	4-Several leaves	3-Good	Spring
7	*Potamogeton richardsonii*	Pondweed	1%	4-Several leaves	3-Good	Summer
10	*Equisetum arvense*	Giant Horsetail	1%	4-Several leaves	2-Fair	Spring
12	*Veronica americana*	Speedwell	3%	4-Several leaves	3-Good	Spring
13	*Veronica americana*	Speedwell	5%	4-Several leaves	3-Good	Spring
14	*Elodea sp.*	Elodea	3%	6-100% developed	4-Excellent	Spring
14	*Potamogeton richardsonii*	Pondweed	20%	5-50% developed	4-Excellent	Spring
16	*Potamogeton richardsonii*	Pondweed	5%	3-2-3 leaves	3-Good	Spring
16	*Lemnoideae spp.*	Duckweed	2%	6-100% developed	3-Good	Spring
16	*Potamogeton richardsonii*	Pondweed	1%	5-50% developed	3-Good	Summer
17	*Potamogeton richardsonii*	Pondweed	1%	6-100% developed	3-Good	Spring
17	*Lemnoideae spp.*	Duckweed	1%	5-50% developed	3-Good	Spring
17	*Elodea sp.*	Elodea	1%	6-100% developed	3-Good	Spring
17	*Potamogeton richardsonii*	Pondweed	1%	4-Several leaves	3-Good	Summer
18	*Potamogeton richardsonii*	Pondweed	2%	6-100% developed	3-Good	Spring
18	*Lemnoideae spp.*	Duckweed	3%	6-100% developed	3-Good	Spring
18	*Sparganium americanum*	Bur Reeds	1%	4-Several leaves	3-Good	Summer
18	*Equisetum arvense*	Giant Horsetail	1%	4-Several leaves	3-Good	Spring
20	*Equisetum arvense*	Giant Horsetail	1%	3-2-3 leaves	2-Fair	Spring
20	*Potamogeton richardsonii*	Pondweed	5%	5-50% developed	2-Fair	Spring
20	*Lemnoideae spp.*	Duckweed	15%	6-100% developed	3-Good	Spring
20	*Elodea sp.*	Elodea	10%	5-50% developed	3-Good	Spring
22	*Potamogeton richardsonii*	Pondweed	2%	4-Several leaves	3-Good	Spring

Table A.38. All trees found to be in the polygons found around the Beaver Wetland at Mary Lake Nature Sanctuary during the spring (April 26th and May 3rd, 2023), and summer (June 21st and July 12th, 2023) vegetation assessments; showing scientific and common names, % cover total, vegetation stage, species vigor, and the season observed; data collected by Wild Riparian Conservation.

Trees				
Polygon ID	Scientific Names	Common Names	# Of Trees Spring	# Of Trees Summer
1	*Thuja plicata*	Western Red Cedar	0	6
4	*Pseudotsuga menziesii*	Douglas Fir	4	4
4	*Thuja plicata*	Western Red Cedar	2	2
5	*Pseudotsuga menziesii*	Douglas Fir	7	7
5	*Thuja plicata*	Western Red Cedar	1	1
7	*Pseudotsuga menziesii*	Douglas Fir	3	3
14	*Pseudotsuga menziesii*	Douglas Fir	3	3
15	*Pseudotsuga menziesii*	Douglas fir	5	3
16	*Thuja plicata*	Western Red Cedar	3	3
16	*Pseudotsuga menziesii*	Douglass Fir	4	4
17	*Thuja plicata*	Western Red Cedar	5	5
17	*Pseudotsuga menziesii*	Douglas Fir	3	3
18	*Pseudotsuga menziesii*	Douglas Fir	1	1
20	*Pseudotsuga menziesii*	Douglas Fir	5	5
21	*Pseudotsuga menziesii*	Douglas Fir	1	1
22	*Pseudotsuga menziesii*	Douglas Fir	1	1
22	*Acer glabrum*	Rocky Mountain Maple	0	1

Table A.39. Species of tree found around the Beaver Wetland at Mary Lake Nature Sanctuary; showing scientific names, common names, and total number of trees, during spring (April 26th and May 3rd, 2023), and summer (June 21st, July 12th, and August 2nd, 2023), data collected by Wild Riparian Conservation.

Trees				
Number	Scientific Names	Common Names	Number of Trees Spring	Number of Trees Summer
1	*Acer glabrum*	Rocky Mountain Maple	0	1
2	*Pseudotsuga menziesii*	Douglas fir	37	35
3	*Thuja plicata*	Western red cedar	11	17

Table A.40. Coordinates for all 23 polygons marked around the Beaver Wetland at MLNS, taken April 12th, 2023, by Kimberly Groome and Harrison Craig using a Garmin handheld GPS.

Wetland Riparian Assessment					
Date: April 12, 2023					
Location: Beaver Wetland (MLNS)					
Assessors: Kimberly, Harrison					
Polygon ID	Easting	Northing	Polygon ID	Easting	Northing
1	48.500626	123.514548	13	48.500326	123.513294
2	48.500669	123.514362	14	48.500317	123.513384
3	48.500735	123.514202	15	48.500190	123.513543
4	48.500811	123.514006	16	48.500063	123.513656
5	48.500927	123.514003	17	48.500136	123.513686
6	48.500920	123.513837	18	48.500263	123.513798
7	48.500804	123.513787	19	48.500361	123.513836
8	48.500727	123.513603	20	48.500482	123.514004
9	48.500625	123.513548	21	48.500486	123.514164
10	48.500612	123.513328	22	48.500540	123.514294
11	48.500552	123.513164	23	48.500600	123.514482
12	48.500431	123.513143			