Maine Department of Environmental Protection
Biological Monitoring Program
Wetland Epiphytic Algae Aquatic Life Classification Attainment Report

Station Information

Station Number: W-062 Trip ID: 2002-062 River Basin: Kennebec
Waterbody: UNNAMED TRIBUTARY TO RIGGS BROOK HUC8 Name: Lower Kennebec
Town: Augusta Latitude: 44 19 59.27 N
Mitigation Monitoring Site: No Longitude: 69 42 12.55 W

Sample Information

Sample ID: WA-062-2002E (1229) Type of Sample: PLANT RUBBINGS Date Sampled: 6/14/2002
Bottle # : 1229 Sampling Organization: BIOMONITORING UNIT Taxonomist: MICHIGAN STATE UNIVERSITY

Classification Attainment

Statutory Class: **Final Determination: B** Date: 8/29/2019
Model Result with P≥0.6: B **Reason for Determination: Model L&w**
Date Last Calculated: 1/15/2019 Comments:

Model Probabilities

First Stage Model

Class A:	0.36	Class C:	0.06
Class B:	0.58	NA:	0.00

B or Better Model

Class A or B	0.94
Class C or Non-Attainment	0.06

C or Better Model

Class A, B, or C	1.00
Non-Attainment	0.00

A Model

Class A	0.36
Class B or C or Non-Attainment	0.64

Model Variables

		Reference Range (10th or 90th percentile value)
Relative Richness of Diatoms in the Eunotiaceae Family	0.074	>0.09
Relative Density of Eutrophentic Diatoms	0.139	<0.15
Relative Richness of Oligosaprobic Diatoms	0.244	>0.37
Relative Richness of Intermediate Taxa	0.691	>0.61
Relative Richness of Sensitive Taxa	0.145	>0.13
Maine Tolerance Index Score for Wetland Epiphytic Algae	38.95	<38

Other Variables

	Density (cells/cm^2)	Relative Density	Richness	Relative Richness	Biovolume (um^3/cm^2)	Relative Biovolume
Total for Sample	12,782	-	94	-	30,045,123	-
Diatom Only	2,696	-	45	-	5,971,361	-
MTI Sensitive	325	0.046	8	0.145	1,383,405	0.139
MTI Intermediate	6,375	0.904	38	0.691	8,438,688	0.849
MTI Eurytopic	353	0.050	9	0.164	122,135	0.012
Ratio of MTI:						
Sensitive to Eurytopic	0.920	0.920	0.889	0.889	11.327	11.327

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Water Chemistry

Sample Date: 6/14/2002 1:30:00 PM

Collection Method	Parameter	Value	Units	Qualifier
Grab Sample	Calcium	8	mg/l	
Grab Sample	Chloride	9	mg/l	
Grab Sample	Chlorophyll A	0.0077	mg/l	
Grab Sample	Dissolved Organic Carbon	23.4	mg/l	
Grab Sample	Magnesium	1.4	mg/l	
Grab Sample	Nitrate As Nitrogen	0.01	mg/l	
Grab Sample	pH	6.6		
Grab Sample	Potassium	0.77	mg/l	
Grab Sample	Sodium	7	mg/l	
Grab Sample	Specific Conductance	77.8	us/cm	
Grab Sample	Sulfate	30	mg/l	
Grab Sample	Total Alkalinity	20	mg/l	
Grab Sample	Total Hardness	26	mg/l	
Grab Sample	Total Kjeldahl Nitrogen (organic And Nh3) As Nitrogen	1	mg/l	
Grab Sample	Total Phosphorus Mixed Forms (po4 And Organic) As Phosphorus	0.027	mg/l	
Grab Sample	True Color	260	unit	
In-situ	Dissolved Oxygen	6.3	mg/l	
In-situ	pH	6.25		
In-situ	Specific Conductance	48	us/cm	
In-situ	Temperature	19.5	deg c	

Landcover Summary - 2004 Data

Total Area (ac)	656	High Int. Dev. %	0.0	Water %	0.0	Non-vegetated %	0.0
		Med Int. Dev. %	0.4	Wetland %	25.0	Tilled Agriculture %	5.4
		Low Int. Dev. %	4.0	Upland Woody %	57.4	Grassland %	5.4
		Development %	4.4	Natural %	83.4	Human Altered %	16.6
						Impervious %	2.2
Total Land (ac)	656	High Int. Dev. %	0.0	Water %	N/A	Non-vegetated %	N/A
		Med Int. Dev. %	0.4	Wetland %	25.0	Tilled Agriculture %	5.4
		Low Int. Dev. %	4.0	Upland Woody %	57.4	Grassland %	5.4
		Development %	4.4	Natural %	83.4	Human Altered %	16.6
						Impervious %	2.2

Summary of Habitat Characteristics

Human Disturbance

Total Score:	26
Hydrologic Modifications to Wetland:	9
Vegetative Modifications to Wetland:	0
Evidence of Chemical Pollutants:	4
Impervious Surface in Watershed:	4
Potential for NPS Pollution:	7

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Summary of Habitat Characteristics

Dominant Plant Species: YELLOW WATER LILY, SPARGANIUM, SEDGES, CATTAIL

Additional Plant Community Observations:

Habitat Classification:
EMERGENT NON-PERSISTENT VEGETATION

Substrate Classification:
SAND SUBSTRATE
DETRITUS SUBSTRATE
SILT/MUCK SUBSTRATE

Visible Flow: Rain In Previous 24 Hours: Unknown

Sample Comments: No comments

Additional Summary Variables

	Density (cells/cm^2)	Relative Density	Richness	Relative Richness	Biovolume (um^3/cm^2)	Relative Biovolume
Diatom Growth Forms and Motility:						
Unattached	198	0.073	1	0.022	422,870	0.071
Variable	544	0.202	4	0.089	84,481	0.014
Erect	310	0.115	9	0.200	890,824	0.149
Stalked	265	0.098	6	0.133	219,021	0.037
Prostrate	1,380	0.512	25	0.556	4,354,166	0.729
Motile	634	0.235	21	0.467	4,255,413	0.713

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Additional Summary Variables

Station Number: W-062 Waterbody: UNNAMED TRIBUTARY TO RIGGS BROOK Town: Augusta

Sample ID: WA-062-2002E (1229) Bottle # : 1229 Calculated: 1/15/2019

	Density (cells/cm^2)	Relative Density	Richness	Relative Richness	Biovolume (um^3/cm^2)	Relative Biovolume
Taxa Group:						
Pennate Diatom	2,696	0.211	45	0.479	5,971,361	0.199
Centric Diatom	0	0.000	0	0.000	0	0.000
Cyanobacteria	4,158	0.325	7	0.074	106,212	0.004
Filamentous Cyanobacteria	0	0.000	0	0.000	0	0.000
Green Algae	3,602	0.282	32	0.340	20,649,484	0.687
Colonial Green	1,647	0.129	8	0.085	382,753	0.013
Filamentous Green	391	0.031	5	0.053	4,617,135	0.154
Unicellular Green	21	0.002	1	0.011	39,847	0.001
Desmid	1,544	0.121	18	0.191	15,609,748	0.520
Red Algae	0	0.000	0	0.000	0	0.000
Euglenoid	82	0.006	3	0.032	510,952	0.017
Chrysophyte	1,461	0.114	3	0.032	215,941	0.007
Cryptophyte	0	0.000	0	0.000	0	0.000
Dinoflagellate	21	0.002	1	0.011	1,891,631	0.063
Yellow Green Algae	762	0.060	3	0.032	699,542	0.023
Haptophyte	0	0.000	0	0.000	0	0.000
Raphidophyte	0	0.000	0	0.000	0	0.000
Synurophyte	0	0.000	0	0.000	0	0.000
Diatom Autecology Groups:						
High Oxygen	1,532	0.621	17	0.415	704,507	0.120
Low Oxygen	103	0.042	4	0.098	18,630	0.003
N-Autotrophic	876	0.369	15	0.395	665,742	0.116
N-Heterotrophic	99	0.042	3	0.079	18,031	0.003
Oligosaprobic	526	0.213	10	0.244	252,092	0.043
Polysaprobic	202	0.082	4	0.098	619,587	0.106
Oligotrophentic	76	0.050	6	0.176	125,088	0.028
Eutrophentic	211	0.139	9	0.265	207,674	0.047
Acidobiontic	0	0.000	0	0.000	0	0.000
Brackish	4	0.002	1	0.023	883	0.000
Dry Condition	4	0.002	1	0.024	149	0.000

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Bottle # : 1229 **Waterbody:** Unnamed Tributary To Riggs Brook - W-062 **Town:** Augusta

Sample ID: WA-062-2002E (1229) **Station Number:** W-062

Taxa Name	Group	Density (cells/ cm^2)	Relative Density			Biovolume (um^3/ cm^2)	Relative Biovolume	Form	Mot-ility	van Dam Index Values							Maine Epi Tolerance
			All	Rank	Diatoms					pH	NO2	S	T	M	Sal		
Undetermined bg filament 1-2µm	Cyanobacteria	844	6.602%	5		14,522	0.048%										
Undetermined bg filament 4.5µm	Cyanobacteria	844	6.602%	5		21,731	0.072%										
Chroococcus minor	Cyanobacteria	535	4.187%	9		12,007	0.040%										41.4-I
Aphanocapsa elachista	Cyanobacteria	288	2.254%	13		1,173	0.004%										37-I
Gloeocapsa	Cyanobacteria	288	2.254%	13		26,483	0.088%										
Aphanothece	Cyanobacteria	617	4.831%	7		11,633	0.039%										
Myxosarcina	Cyanobacteria	741	5.797%	6		18,663	0.062%										
Fragilaria tenera	Pennate Diatom	337	2.637%	11	12.5%	46,462	0.155%	V	N	2	1	1	1	2	2	1	41.5-I
Fragilaria sepes	Pennate Diatom	54	0.422%	37	2.0%	9,473	0.032%	V	N	3	1	1	1	2	2	1	38.7-I
Staurosira construens var. venter	Pennate Diatom	117	0.914%	24	4.3%	13,542	0.045%	V	N	4	2	1	2	4	1	2	32.4-I
Staurosirella pinnata	Pennate Diatom	36	0.281%	50	1.3%	15,004	0.050%	V	N	4	2	1	2	7	3	2	48.5-I
Ulnaria acus	Pennate Diatom	45	0.352%	38	1.7%	23,821	0.079%	E	N	4	2	2	3	5	2	2	57.4-E
Ulnaria ulna	Pennate Diatom	103	0.809%	25	3.8%	601,556	2.002%	E	N	4	2	3	4		2	2	44.5-I
Tabellaria flocculosa	Pennate Diatom	198	1.547%	15	7.3%	422,870	1.407%	U	N	2	1	1	2	3	3	1	24.7-S
Achnanthes lineariformis	Pennate Diatom	189	1.477%	16	7.0%	20,115	0.067%	P	V	3							32.3-I
Achnanthidium minutissimum	Pennate Diatom	521	4.078%	10	19.3%	32,832	0.109%	P	N	6	2	1	2	7	3	2	49.5-I
Lemnicola hungarica	Pennate Diatom	4	0.035%	94	0.2%	598	0.002%	P	V	4	2	4	3	6	1	2	96.6-E
Cocconeis placentula	Pennate Diatom	31	0.246%	51	1.2%	45,207	0.150%	P	N	4	2	3	2	5	2	2	67.9-E
Eunotia bilunaris	Pennate Diatom	76	0.598%	29	2.8%	135,208	0.450%	E	V	6	2	2	2	7	3	2	36.1-I
Eunotia implicata	Pennate Diatom	27	0.211%	53	1.0%	44,150	0.147%	E	V	2					3	1	35.7-I
Eunotia meisteri	Pennate Diatom	4	0.035%	94	0.2%	149	0.000%	E	V	2	1	1	1	1	4	1	
Eunotia naegelii	Pennate Diatom	40	0.316%	49	1.5%	33,379	0.111%	E	V	2	1	1	1	1	3	1	28.5-I
Eunotia pectinalis	Pennate Diatom	4	0.035%	94	0.2%	21,720	0.072%	E	V	2	2	1	2	3	3	1	28.4-I
Eunotia pirla	Pennate Diatom	4	0.035%	94	0.2%	9,690	0.032%	E	V								14.6-S
Eunotia tetraodon	Pennate Diatom	4	0.035%	94	0.2%	21,151	0.070%	E	V	2	1	1	1	1	3	1	22.2-S
Encyonema silesiacum	Pennate Diatom	135	1.055%	22	5.0%	48,724	0.162%	S	V	3	2	3	3	7	1	2	45.6-I
Cymbopleura naviculiformis	Pennate Diatom	9	0.070%	84	0.3%	73,683	0.245%	S	V	3	2	2	2	5	2	2	29.2-I
Gomphonema acuminatum	Pennate Diatom	18	0.141%	73	0.7%	45,449	0.151%	S	N	4	1	2	2	5	2	2	41.4-I
Gomphonema gracile	Pennate Diatom	40	0.316%	49	1.5%	21,640	0.072%	S	N	3	1	1	1	3	3	2	38.6-I
Gomphonema truncatum	Pennate Diatom	4	0.035%	94	0.2%	14,391	0.048%	S	N	4	1	2	2	4	2	2	54.3-E
Gomphonema cf. parvulum MESLAP4	Pennate Diatom	58	0.457%	36	2.2%	15,133	0.050%	S	N	3	3	4	4	5	3	2	36.7-I
Caloneis bacillum	Pennate Diatom	13	0.105%	78	0.5%	4,835	0.016%	P	M	4	1	2	2	4	2	2	49.5-I
Frustulia krammeri	Pennate Diatom	9	0.070%	84	0.3%	15,829	0.053%	P	M	2	1	1	1	1	2	1	16.6-S
Hippodonta capitata	Pennate Diatom	4	0.035%	94	0.2%	1,701	0.006%	P	M	4	2	3	3	4	3	2	70-E
Navicula cryptocephala	Pennate Diatom	67	0.527%	30	2.5%	27,269	0.091%	P	M	4	2	3	3	7	2	2	66.2-E
Pinnularia acrosphaeria	Pennate Diatom	18	0.141%	73	0.7%	88,668	0.295%	P	M	3		3	1	2	3	1	
Pinnularia gibba var. linearis	Pennate Diatom	9	0.070%	84	0.3%	44,308	0.147%	P	M	2				1		1	19.4-S
Pinnularia nodosa	Pennate Diatom	9	0.070%	84	0.3%	10,273	0.034%	P	M	2	1	1	1	1	3	1	32.9-I
Pinnularia subcapitata	Pennate Diatom	9	0.070%	84	0.3%	8,595	0.029%	P	M	2	2	3	2	2	3	2	31.5-I
Pinnularia viridis	Pennate Diatom	18	0.141%	73	0.7%	573,312	1.908%	P	M	3	2	3	2	7	3	2	25.8-S
Sellaphora laevissima	Pennate Diatom	9	0.070%	84	0.3%	5,069	0.017%	P	M	3	1	1	1	3	2	1	32.1-I

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Bottle # : 1229 **Waterbody:** Unnamed Tributary To Riggs Brook - W-062 **Town:** Augusta

Sample ID: WA-062-2002E (1229) **Station Number:** W-062

Taxa Name	Group	Density (cells/ cm^2)	Relative Density			Biovolume (um^3/ cm^2)	Relative Biovolume	Form	Mot-ility	van Dam Index Values							Maine Epi Tolerance
			All	Rank	Diatoms					pH	N	O2	S	T	M	Sal	
Sellaphora pupula	Pennate Diatom	13	0.105%	78	0.5%	4,388	0.015%	P	M	3	2	3	3	4	2	2	51.3-I
Sellaphora seminulum	Pennate Diatom	13	0.105%	78	0.5%	1,386	0.005%	P	M	3	3	4	4	5	3	2	48.7-I
Stauroneis anceps	Pennate Diatom	13	0.105%	78	0.5%	33,921	0.113%	P	M	3	2	2	2	4	2	2	29.2-I
Stauroneis kriegeri	Pennate Diatom	4	0.035%	94	0.2%	1,208	0.004%	P	M	3	2	2	2	4	3	2	54.6-E
Stauroneis phoenicenteron	Pennate Diatom	180	1.406%	17	6.7%	3,386,579	11.272%	P	M	3	2	3	2	4	2	2	35.4-I
Eolimna minima	Pennate Diatom	27	0.211%	53	1.0%	1,513	0.005%	P	M	4	3	4	4	5	3	2	53.2-E
Nitzschia acidoclinata	Pennate Diatom	130	1.020%	23	4.8%	14,469	0.048%	P	H	3	1	1	2	3	3	1	43.4-I
Nitzschia clausii	Pennate Diatom	4	0.035%	94	0.2%	883	0.003%	P	H	4	2	2	3	5	3	4	
Nitzschia gracilis	Pennate Diatom	63	0.492%	31	2.3%	10,562	0.035%	P	H	3		2	2	3	1	1	37.6-I
Nitzschia nana	Pennate Diatom	13	0.105%	78	0.5%	20,343	0.068%	P	H	3		1	2	3	3	2	43.5-I
Nitzschia subacicularis	Pennate Diatom	4	0.035%	94	0.2%	303	0.001%	P	H	4	1	1	2	7	2	2	35.9-I
Undetermined flagellate chrysophyte MESLAP	Chrysophyte	21	0.161%	70		3,501	0.012%										
Dinobryon sertularia	Chrysophyte	1,379	10.789%	1		206,785	0.688%										37.7-I
Dinobryon tabellariae	Chrysophyte	62	0.483%	35		5,655	0.019%										26.2-S
Characiopsis	Yellow Green Algae	62	0.483%	35		116,129	0.387%										
Ophiocytium	Yellow Green Algae	144	1.127%	21		114,867	0.382%										
Tribonema affine	Yellow Green Algae	556	4.348%	8		468,546	1.559%										42.2-I
Peridinium sp. 1 MESLAP	Dinoflagellate	21	0.161%	70		1,891,631	6.296%										
Undetermined green coccoid 5-7µm	Colonial Green	1,029	8.052%	2		322,437	1.073%										
Undetermined green flagellate	Colonial Green	21	0.161%	70		3,141	0.010%										
Characium	Colonial Green	62	0.483%	35		35,016	0.117%										
Tetraedron regulare v. torsum	Unicellular Green	21	0.161%	70		39,847	0.133%										
Gloeocystis sp. 1 MESLAP	Colonial Green	21	0.161%	70		4,778	0.016%										
Stauridium tetras	Colonial Green	165	1.288%	20		5,536	0.018%										38-I
Ankistrodesmus	Colonial Green	21	0.161%	70		942	0.003%										
Ankistrodesmus falcatus	Colonial Green	165	1.288%	20		4,476	0.015%										36.8-I
Scenedesmus quadricauda	Colonial Green	165	1.288%	20		6,426	0.021%										58-E
Bulbochaete	Filamentous Green	41	0.322%	47		218,335	0.727%										
Oedogonium 10-12µm	Filamentous Green	206	1.610%	14		1,576,290	5.246%										
Oedogonium 15-20 µm	Filamentous Green	41	0.322%	47		575,839	1.917%										
Arthrodesmus convergens var. incrassatus	Desmid	21	0.161%	70		342,014	1.138%										
Cosmarium angulosum	Desmid	21	0.161%	70		12,308	0.041%										32.4-I
Cosmarium portianum	Desmid	41	0.322%	47		1,662,566	5.534%										
Cosmarium regnellii var. minimum	Desmid	82	0.644%	28		27,028	0.090%										35.2-I
Cosmarium sp. 8 MESLAP	Desmid	103	0.805%	26		172,687	0.575%										
Euastrum bidentatum	Desmid	21	0.161%	70		290,591	0.967%										17.4-S
Euastrum insulare var. silesiacum	Desmid	21	0.161%	70		20,056	0.067%										
Hyalotheca mucosa	Desmid	885	6.924%	3		2,701,210	8.991%										30.7-I
Micrasterias radiosa	Desmid	21	0.161%	70		1,615,711	5.378%										
Pleurotaenium ehrenbergii v. elongatum	Desmid	21	0.161%	70		6,355,462	21.153%										

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Bottle # : 1229 **Waterbody:** Unnamed Tributary To Riggs Brook - W-062 **Town:** Augusta

Sample ID: WA-062-2002E (1229) **Station Number:** W-062

Taxa Name	Group	Density (cells/ cm^2)	Relative Density		Biovolume (um^3/ cm^2)	Relative Biovolume	van Dam Index Values							Maine Epi Tolerance
			All	Rank Diatoms			Form	Mot-ility	pH	NO2	S	T	M	Sal	
Staurastrum antelopeum var. polymazum	Desmid	21	0.161%	70	1,086,727	3.617%									
Staurastrum cf. cyrtocerum	Desmid	21	0.161%	70	5,570	0.019%									
Staurastrum dejectum	Desmid	21	0.161%	70	3,208	0.011%									
Staurastrum excavatum	Desmid	41	0.322%	47	7,166	0.024%									
Staurastrum margaritaceum (larger)	Desmid	82	0.644%	28	774,716	2.579%									
Staurastrum muticum	Desmid	41	0.322%	47	9,381	0.031%									
Staurastrum setigerum	Desmid	41	0.322%	47	15,971	0.053%									
Closterium cf. archerianum	Desmid	41	0.322%	47	507,376	1.689%									
Mougeotia 10-12µm	Filamentous Green	62	0.483%	35	320,826	1.068%									29.5-I
Mougeotia 15-25µm	Filamentous Green	41	0.322%	47	1,925,845	6.410%									
Euglena sp. 1 MESLAP	Euglenoid	21	0.161%	70	215,428	0.717%									
Euglena sp. 2 MESLAP	Euglenoid	21	0.161%	70	87,162	0.290%									
Phacus sp. 1 MESLAP	Euglenoid	41	0.322%	47	208,362	0.693%									