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

Station Information

Station Number: W-292 Trip ID: 2016-292 River Basin: Maine Coastal
Waterbody: CARD BROOK HUC8 Name: Maine Coastal
Town: Ellsworth Latitude: 44 32 12.14 N
Mitigation Monitoring Site: No Longitude: 68 24 13.67 W

Sample Information

Sample ID: WA-292-2016E (1600) Type of Sample: PLANT RUBBINGS Date Sampled: 6/23/2016
Bottle # : 1600 Sampling Organization: BIOMONITORING UNIT Taxonomist: ACADEMY OF NATURAL SCIENCES

Classification Attainment

Statutory Class: B **Final Determination: B** Date: 9/20/2019
Model Result with P≥0.6: B **Reason for Determination: Model L&w**
Date Last Calculated: 2/28/2019 Comments:

Model Probabilities

First Stage Model

Class A:	0.59	Class C:	0.00
Class B:	0.41	NA:	0.00

B or Better Model

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

C or Better Model

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

A Model

Class A	0.59
Class B or C or Non-Attainment	0.41

Model Variables

		Reference Range (10th or 90th percentile value)
Relative Richness of Diatoms in the Eunotiaceae Family	0.156	>0.09
Relative Density of Eutrophentic Diatoms	0.057	<0.15
Relative Richness of Oligosaprobic Diatoms	0.489	>0.37
Relative Richness of Intermediate Taxa	0.707	>0.61
Relative Richness of Sensitive Taxa	0.138	>0.13
Maine Tolerance Index Score for Wetland Epiphytic Algae	37.42	<38

Other Variables

	Density (cells/cm^2)	Relative Density	Richness	Relative Richness	Biovolume (um^3/cm^2)	Relative Biovolume
Total for Sample	177,189	-	90	-	4,470,844,660	-
Diatom Only	24,219	-	60	-	12,322,303	-
MTI Sensitive	1,579	0.033	8	0.138	3,644,053	0.002
MTI Intermediate	45,168	0.931	41	0.707	1,734,255,413	0.997
MTI Eurytopic	1,762	0.036	9	0.155	1,211,111	0.001
Ratio of MTI:						
Sensitive to Eurytopic	0.896	0.896	0.889	0.889	3.009	3.009

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Water Chemistry

Sample Date: 6/23/2016 11:45:00 AM

Collection Method	Parameter	Value	Units	Qualifier
Grab Sample	Chloride	92	mg/l	
Grab Sample	Chlorophyll A	0.0028	mg/l	
Grab Sample	Chlorophyll A - Phaeophytin	0.0017	mg/l	
Grab Sample	Dissolved Organic Carbon	7.5	mg/l	
Grab Sample	Nitrate + Nitrite As Nitrogen		mg/l	U
Grab Sample	Orthophosphate As Phosphorus	1	ug/l	
Grab Sample	Total Alkalinity	23	mg/l	
Grab Sample	Total Kjeldahl Nitrogen (organic And Nh3) As Nitrogen	0.4	mg/l	
Grab Sample	Total Phosphorus Mixed Forms (po4 And Organic) As Phosphorus	25	ug/l	
Grab Sample	True Color	100	ptco	
In-situ	Dissolved Oxygen	6.29	mg/l	
In-situ	Dissolved Oxygen Saturation	71.4	%	
In-situ	pH	6.65		
In-situ	Specific Conductance	362	us/cm	
In-situ	Temperature	21	deg c	

Landcover Summary - 2004 Data

Total Area (ac)	3831	High Int. Dev. %	2.8	Water %	0.0	Non-vegetated %	2.7
		Med Int. Dev. %	4.1	Wetland %	16.0	Tilled Agriculture %	4.9
		Low Int. Dev. %	7.3	Upland Woody %	56.2	Grassland %	3.9
		Development %	14.3	Natural %	72.3	Human Altered %	27.7
						Impervious %	6.2
Total Land (ac)	3830	High Int. Dev. %	2.8	Water %	N/A	Non-vegetated %	N/A
		Med Int. Dev. %	4.1	Wetland %	16.0	Tilled Agriculture %	4.9
		Low Int. Dev. %	7.4	Upland Woody %	56.3	Grassland %	3.9
		Development %	14.3	Natural %	72.3	Human Altered %	27.7
						Impervious %	6.2

Summary of Habitat Characteristics

Human Disturbance

Total Score:	22
Hydrologic Modifications to Wetland:	2
Vegetative Modifications to Wetland:	1
Evidence of Chemical Pollutants:	7
Watershed Characterization and Potential NPS Pollution Impacts:	12

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Summary of Habitat Characteristics

Dominant Plant Species:

Additional Plant Community Observations: SEDGES, GRASSES, RUSHES

Habitat Classification:
AQUATIC MACROPHYTE BED
EMERGENT NON-PERSISTENT VEGETATION

Substrate Classification:
SILT/MUCK SUBSTRATE

Visible Flow: No Rain In Previous 24 Hours: Unknown

Sample Comments: VERY LOW WATER LEVELS; AQUATIC PLANTS ABOVE WATER LINE IN PLACES

Common Plants Observed

Scientific Name	Common Name	Maine Taxonomic Code	Plant CoC Score	Wetland Indicator Status	Growth Form
Nuphar lutea ssp. variegata	Variegated yellow pond-lily	LW-34023103002002	4	OBL	FORB/HERB
Sagittaria		LW-34011401002			PLANT

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	1,534	0.063	5	0.083	2,686,666	0.218
Variable	12,917	0.533	7	0.117	1,764,037	0.143
Erect	5,086	0.210	18	0.300	4,611,127	0.374
Stalked	242	0.010	4	0.067	91,879	0.007
Prostrate	4,440	0.183	26	0.433	3,168,594	0.257
Motile	2,503	0.103	19	0.317	2,905,143	0.236

Additional Summary Variables

Station Number: W-292 Waterbody: CARD BROOK Town: Ellsworth

Sample ID: WA-292-2016E (1600) Bottle # : 1600 Calculated: 2/28/2019

	Density (cells/cm^2)	Relative Density	Richness	Relative Richness	Biovolume (um^3/cm^2)	Relative Biovolume
Taxa Group:						
Pennate Diatom	23,614	0.133	58	0.644	11,582,399	0.003
Centric Diatom	605	0.003	2	0.022	739,905	0.000
Cyanobacteria	20,329	0.115	3	0.033	402,937	0.000
Filamentous Cyanobacteria	20,329	0.115	3	0.033	402,937	0.000
Green Algae	132,139	0.746	25	0.278	4,457,642,551	0.997
Colonial Green	5,772	0.033	7	0.078	1,474,426	0.000
Filamentous Green	82,194	0.464	7	0.078	3,063,731,690	0.685
Unicellular Green	1,506	0.008	2	0.022	225,136	0.000
Desmid	42,666	0.241	9	0.100	1,392,211,299	0.311
Red Algae	0	0.000	0	0.000	0	0.000
Euglenoid	251	0.001	1	0.011	400,709	0.000
Chrysophyte	251	0.001	1	0.011	76,159	0.000
Cryptophyte	0	0.000	0	0.000	0	0.000
Dinoflagellate	0	0.000	0	0.000	0	0.000
Yellow Green Algae	0	0.000	0	0.000	0	0.000
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	19,779	0.907	27	0.628	6,476,281	0.780
Low Oxygen	605	0.028	3	0.070	557,166	0.067
N-Autotrophic	6,580	0.313	25	0.610	5,101,691	0.689
N-Heterotrophic	686	0.033	3	0.073	420,119	0.057
Oligosaprobic	5,813	0.259	23	0.489	4,171,361	0.484
Polysaprobic	605	0.027	3	0.064	430,962	0.050
Oligotrophentic	2,503	0.127	10	0.250	1,456,570	0.146
Eutrophentic	1,130	0.057	6	0.150	2,012,599	0.201
Acidobiontic	242	0.011	3	0.060	103,672	0.010
Brackish	646	0.028	3	0.060	419,249	0.038
Dry Condition	807	0.037	4	0.093	477,085	0.056

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Bottle # : 1600 **Waterbody:** Card Brook - W-292 **Town:** Ellsworth

Sample ID: WA-292-2016E (1600) **Station Number:** W-292

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	N	O2	S	T	M	Sal	
LIVE DIATOM CELLS		24,219															
DEAD DIATOM CELLS		5,772															
Nostoc	Filamentous Cyanobacteria	9,788	5.524%	6		347,664	0.008%										
Leptolyngbya	Filamentous Cyanobacteria	9,161	5.170%	7		42,454	0.001%										
Pseudanabaena	Filamentous Cyanobacteria	1,380	0.779%	13		12,819	0.000%										
Aulacoseira lirata	Centric Diatom	121	0.068%	65	0.5%	344,121	0.008%	U	N							1	
Cyclotella meneghiniana	Centric Diatom	484	0.273%	28	2.0%	395,784	0.009%	U	N	4	3	5	4	5	2	3	85.6-E
Fragilaria capucina	Pennate Diatom	242	0.137%	42	1.0%	124,919	0.003%	V	N	3			2	3		2	58.2-E
Fragilaria gracilis	Pennate Diatom	283	0.159%	32	1.2%	22,436	0.001%	V	N	3	1	1	1	2		2	39.1-I
Fragilaria tenera	Pennate Diatom	40	0.023%	90	0.2%	15,492	0.000%	V	N	2	1	1	1	2	2	1	41.5-I
Fragilariforma virescens	Pennate Diatom	283	0.159%	32	1.2%	633,258	0.014%	V	N	3	1	1	1	2	3	1	7.8-S
Meridion circulare var. constrictum	Pennate Diatom	242	0.137%	42	1.0%	186,863	0.004%	E	N	4	2	2	2	7	2	2	43.8-I
Pseudostaurosira brevistriata	Pennate Diatom	1,292	0.729%	14	5.3%	210,141	0.005%	E	N	4	1	1	1	7	2	2	34.9-I
Stauroforma exiguiformis	Pennate Diatom	242	0.137%	42	1.0%	26,165	0.001%	E	N	3	1	1	1	1	2	1	28.7-I
Staurosira construens	Pennate Diatom	81	0.046%	79	0.3%	16,107	0.000%	V	N	4	1	1	2	4	1	2	44-I
Staurosira construens var. venter	Pennate Diatom	11,787	6.652%	5	48.7%	931,243	0.021%	V	N	4	2	1	2	4	1	2	32.4-I
Staurosirella pinnata	Pennate Diatom	202	0.114%	45	0.8%	20,581	0.000%	V	N	4	2	1	2	7	3	2	48.5-I
Ulnaria biceps	Pennate Diatom	363	0.205%	30	1.5%	1,525,804	0.034%	E	N	4				5		2	38.2-I
Tabellaria fenestrata	Pennate Diatom	81	0.046%	79	0.3%	451,818	0.010%	U	N	3	1	1	2	2		1	29.1-I
Tabellaria flocculosa	Pennate Diatom	646	0.364%	20	2.7%	1,008,743	0.023%	U	N	2	1	1	2	3	3	1	24.7-S
Tabellaria flocculosa var. linearis	Pennate Diatom	202	0.114%	45	0.8%	486,200	0.011%	U	N								27.8-I
Achnanthidium minutissimum	Pennate Diatom	969	0.547%	18	4.0%	34,424	0.001%	P	N	6	2	1	2	7	3	2	49.5-I
Psammothidium bioretii	Pennate Diatom	81	0.046%	79	0.3%	26,542	0.001%	P	V	3	1	1	1	3	4	2	27.3-I
Psammothidium helveticum	Pennate Diatom	81	0.046%	79	0.3%	90,934	0.002%	P	V	4	2	2	1	3	3	1	
Psammothidium subatomoides	Pennate Diatom	484	0.273%	28	2.0%	34,509	0.001%	P	V	2	1	1	1	2	1	1	27.6-I
Psammothidium scoticum	Pennate Diatom	242	0.137%	42	1.0%	19,751	0.000%	P	V								
Rossithidium linearis	Pennate Diatom	40	0.023%	90	0.2%	7,770	0.000%	P	V	3							32.1-I
Cocconeis placentula var. lineata	Pennate Diatom	40	0.023%	90	0.2%	49,521	0.001%	P	N	4	2	3	2	5	2	2	53.6-E
Eunotia	Pennate Diatom	81	0.046%	79	0.3%	45,209	0.001%	E	V								
Eunotia bilunaris	Pennate Diatom	121	0.068%	65	0.5%	35,761	0.001%	E	V	6	2	2	2	7	3	2	36.1-I
Eunotia diodon	Pennate Diatom	121	0.068%	65	0.5%	299,106	0.007%	E	V	2	1	1	1	1	4	1	
Eunotia exigua	Pennate Diatom	81	0.046%	79	0.3%	10,073	0.000%	E	V	1	2	2	3	7	3	2	22.7-S
Eunotia faba	Pennate Diatom	121	0.068%	65	0.5%	237,304	0.005%	E	V	2	1	1	1	2	2	1	
Eunotia flexuosa	Pennate Diatom	121	0.068%	65	0.5%	810,545	0.018%	E	V	2	1	1	1	2	3	1	27.2-I
Eunotia incisa	Pennate Diatom	1,090	0.615%	15	4.5%	375,694	0.008%	E	V	2	1	1	1	1	2	1	28-I
Eunotia meisteri	Pennate Diatom	363	0.205%	30	1.5%	42,184	0.001%	E	V	2	1	1	1	1	4	1	
Eunotia minor	Pennate Diatom	242	0.137%	42	1.0%	109,252	0.002%	E	V	2			1		4	1	38-I
Eunotia naegelii	Pennate Diatom	161	0.091%	47	0.7%	97,745	0.002%	E	V	2	1	1	1	1	3	1	28.5-I
Eunotia nymanniana	Pennate Diatom	81	0.046%	79	0.3%	57,674	0.001%	E	V	2	1		1	1		1	18.3-S

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Bottle # : 1600 **Waterbody:** Card Brook - W-292 **Town:** Ellsworth

Sample ID: WA-292-2016E (1600) **Station Number:** W-292

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	
Eunotia pectinalis	Pennate Diatom	40	0.023%	90	0.2%	86,300	0.002%	E	V	2	2	1	2	3	3	1	28.4-I
Eunotia septentrionalis	Pennate Diatom	202	0.114%	45	0.8%	434,807	0.010%	E	V	2	1	1	1	1	3	1	17.4-S
Eunotia subarcuatoides	Pennate Diatom	121	0.068%	65	0.5%	20,499	0.000%	E	V	1	1	1	1	1	3	1	27.6-I
Encyonema silesiacum	Pennate Diatom	40	0.023%	90	0.2%	29,710	0.001%	S	V	3	2	3	3	7	1	2	45.6-I
Gomphonema hebridense	Pennate Diatom	40	0.023%	90	0.2%	14,548	0.000%	S	N								67-E
Gomphonema parvulum	Pennate Diatom	81	0.046%	79	0.3%	18,024	0.000%	S	N	3	3	4	4	5	3	2	55.7-E
Gomphonema exilissimum	Pennate Diatom	81	0.046%	79	0.3%	29,597	0.001%	S	N	3	1	1	1	1		1	
Brachysira microcephala	Pennate Diatom	121	0.068%	65	0.5%	14,328	0.000%	P	M	4	1	2	1	2	2	2	29.4-I
Cavinula cocconeiformis	Pennate Diatom	81	0.046%	79	0.3%	62,022	0.001%	P	M	3	1	1	1	2	3	1	
Cavinula pseudoscutiformis	Pennate Diatom	121	0.068%	65	0.5%	61,541	0.001%	P	M	4	1	2	2	4	3	2	11.7-S
Frustulia crassinervia	Pennate Diatom	40	0.023%	90	0.2%	73,100	0.002%	P	M	1	1	1	1	1	3	1	17.1-S
Navicula notha	Pennate Diatom	40	0.023%	90	0.2%	12,396	0.000%	P	M								28.4-I
Navicula rhynchocephala	Pennate Diatom	40	0.023%	90	0.2%	143,358	0.003%	P	M	4	2	4	2	7	2	2	54.4-E
Neidium ampliatum	Pennate Diatom	161	0.091%	47	0.7%	634,168	0.014%	P	M	3				2	3	2	29-I
Nupela vitiosa	Pennate Diatom	121	0.068%	65	0.5%	6,333	0.000%	P	M								
Pinnularia acrosphaeria	Pennate Diatom	81	0.046%	79	0.3%	448,025	0.010%	P	M	3		3	1	2	3	1	
Pinnularia gibbiformis	Pennate Diatom	81	0.046%	79	0.3%	605,559	0.014%	P	M								
Sellaphora nigri	Pennate Diatom	81	0.046%	79	0.3%	2,570	0.000%	P	M								
Stauroneis anceps	Pennate Diatom	40	0.023%	90	0.2%	240,057	0.005%	P	M	3	2	2	2	4	2	2	29.2-I
Stauroneis kriegeri	Pennate Diatom	81	0.046%	79	0.3%	20,815	0.000%	P	M	3	2	2	2	4	3	2	54.6-E
Humidophila schmassmannii	Pennate Diatom	242	0.137%	42	1.0%	5,687	0.000%	P	M								
Nitzschia acidoclinata	Pennate Diatom	242	0.137%	42	1.0%	40,332	0.001%	P	H	3	1	1	2	3	3	1	43.4-I
Nitzschia capitellata	Pennate Diatom	40	0.023%	90	0.2%	17,154	0.000%	P	H	4			5	6	3	4	
Nitzschia frustulum	Pennate Diatom	121	0.068%	65	0.5%	6,311	0.000%	P	H	4	4	3	2	5	3	3	41.7-I
Nitzschia gracilis	Pennate Diatom	242	0.137%	42	1.0%	75,800	0.002%	P	H	3		2	2	3	1	1	37.6-I
Nitzschia nana	Pennate Diatom	525	0.296%	21	2.2%	435,586	0.010%	P	H	3		1	2	3	3	2	43.5-I
Dinobryon sertularia	Chrysophyte	251	0.142%	34		76,159	0.002%										37.7-I
Sphaerocystis	Unicellular Green	1,004	0.567%	17		90,924	0.002%										
Gloeocystis	Colonial Green	1,004	0.567%	17		152,165	0.003%										41.6-I
Gloeocystis maxima	Colonial Green	502	0.283%	26		618,318	0.014%										
Stauridium tetras	Colonial Green	502	0.283%	26		17,252	0.000%										38-I
Ankistrodesmus falcatus	Colonial Green	753	0.425%	19		67,165	0.002%										36.8-I
Oocystis	Colonial Green	502	0.283%	26		366,886	0.008%										
Scenedesmus acutus	Colonial Green	2,008	1.133%	11		209,207	0.005%										44.8-I
Scenedesmus quadricauda	Colonial Green	502	0.283%	26		43,433	0.001%										58-E
Bulbochaete	Filamentous Green	2,133	1.204%	10		9,885,670	0.221%										
Oedogonium	Filamentous Green	12,925	7.295%	3		318,764,064	7.130%										38.2-I
Chlamydomonas	Unicellular Green	502	0.283%	26		134,212	0.003%										43.4-I
Cosmarium reniforme	Desmid	125	0.071%	55		1,672,296	0.037%										30.6-I
Cosmarium impressulum	Desmid	125	0.071%	55		476,363	0.011%										
Desmidium grevellii	Desmid	40,156	22.663%	2		30,877,994	0.691%										
Euastrum pulchellum	Desmid	125	0.071%	55		1,364,856	0.031%										15-S
Pleurotaenium trabecula	Desmid	1,631	0.921%	12		1,349,457,536	30.184%										48.4-I
Actinotaenium globosum	Desmid	125	0.071%	55		2,084,934	0.047%										

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Sample ID: WA-292-2016E (1600) **Station Number:** W-292

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	N	O2	S	T	M	Sal	
Closterium cornu	Desmid	125	0.071%	55	646,535	0.014%										
Closterium dianae	Desmid	125	0.071%	55	1,273,497	0.028%										
Closterium kutzingii	Desmid	125	0.071%	55	4,357,287	0.097%										
Netrium digitus	Filamentous Green	125	0.071%	55	1,875,434	0.042%										
Mougeotia	Filamentous Green	5,647	3.187%	8	56,684,775	1.268%										37.5-I
Mougeotia 5-7µm	Filamentous Green	5,270	2.975%	9	3,538,580	0.079%										
Spirogyra spp. (55um)	Filamentous Green	12,674	7.153%	4	1,464,065,789	32.747%										
Zygnema	Filamentous Green	43,419	24.504%	1	1,208,917,379	27.040%										
Trachelomonas volvocina	Euglenoid	251	0.142%	34	400,709	0.009%										54.7-E