



Pre-Permitting Environmental / Socio-Economic Data Report Series

Report Series J- Marine Nearshore Fish and Benthic Invertebrates

Report J-1 Marine Benthic Macrobiota Data Tables 2004-2007

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Preliminary data. Do not cite or quote.

The Pebble Partnership is providing environmental and socio-economic baseline data collected to inform the development of the Pebble Project to state and federal agencies, project stakeholders and the general public prior to project permitting as part of its commitment to full and open disclosure.

A comprehensive Environmental Baseline Document (EBD) will subsequently be prepared and appended to future project permit applications. The EBD will also be made publicly available when complete.

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Report J-1 Table 1

Macrobiota at Port Site 1 - Upper and Middle Tidal Elevations; April 2006

Species	Upper Elevation		Middle Elevation	
	Apr 2006		Apr 2006	
	n = 5		n = 10	
	Mean	S.D.	Mean	S.D.
Plants (% cover)				
Diatoms			51.10	28.17
Encrusting coralline algae	0.80	1.79	1.30	3.77
Encrusting green algae			0.60	1.58
Filamentous green algae			1.30	2.49
<i>Fucus distichus</i> ssp. <i>evanescens</i>	4.20	4.91	3.35	4.88
<i>Halosaccion glandiforme</i>			0.60	0.39
<i>Mastocarpus papillatus</i>			0.75	0.75
<i>Neorhodomela larix</i>	3.20	6.61	0.10	0.21
<i>Palmaria callophylloides</i>			0.20	0.26
<i>Palmaria hecatensis</i>			2.10	2.12
<i>Ulva/Ulvaria</i> sp.			0.15	0.24
Total Algal Cover (ex. Diatoms)	8.20	7.64	10.45	8.16
Animals (#/0.25m²)				
Gammaridea			0.05	0.16
<i>Lacuna</i> sp.				
<i>Littorina sitkana</i>	70.20	47.20	1.10	2.08
<i>Lottia pelta</i>	0.40	0.89	0.50	1.58
Lottiidae	0.20	0.45	4.10	5.09
<i>Nucella lima</i>			0.70	1.34
<i>Pagurus granosimanus</i>	0.80	1.79	0.10	0.32
Animal Area Cover (%)				
<i>Chthamalus dalli</i>	5.60	5.55	1.00	1.45
<i>Halichondria panicea</i>			0.05	0.16
<i>Semibalanus balanoides</i>	0.40	0.42		
Dead Animals				
<i>Chthamalus dalli</i> (dead)	2.10	2.25		

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Report J-1 Table 2

Macrobiota at Port Site 1 - Lower Tidal Elevation; 2004-2006

Species	Lower Elevation					
	Aug 2004		Jul 2005		Apr 2006	
	n = 6		n = 6		n = 6	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Acrosiphonia arcta</i>	3.75	8.00	1.42	1.80	0.50	1.22
<i>Acrosiphonia duriuscula</i>			0.17	0.41		
<i>Alaria marginata</i>	6.67	14.02				
<i>Alaria</i> sp.					10.00	8.37
<i>Alaria taeniata</i>	0.50	1.22	10.17	15.75		
Articulated coralline algae					0.08	0.20
Black-Green algal crust			0.33	0.82		
<i>Bossiella cretacea</i>			0.17	0.41		
<i>Bossiella plumosa</i>			0.75	0.99		
<i>Bossiella</i> sp.					0.75	1.17
<i>Clathromorphum reclinatum</i>	0.08	0.20				
<i>Constantinea sublifera</i>	1.17	1.47	1.50	2.05	2.00	1.90
<i>Corallina frondescens</i>	0.92	0.58	0.83	1.13		
<i>Cryptosiphonia woodii</i>	0.33	0.82	0.67	1.03		
Diatoms					21.67	16.33
Encrusting coralline algae	20.08	20.88	21.83	26.04	25.25	14.94
Encrusting red algae			0.17	0.41		
Filamentous green algae					16.67	19.41
<i>Fucus distichus</i> ssp. <i>evanescens</i>	1.17	2.40	5.67	12.03	0.42	0.80
<i>Halosaccion glandiforme</i>	0.33	0.41	0.33	0.52	0.33	0.26
<i>Mastocarpus papillatus</i>	1.67	2.07	10.75	13.24	3.50	2.88
<i>Mazzaella parvula</i>	0.17	0.26				
<i>Mazzaella phyllocarpa</i>	1.33	3.27				
<i>Mazzaella</i> sp.			0.67	1.03	2.67	6.06
<i>Monostroma grevillei</i>			0.08	0.20		
<i>Neohypophyllum middendorffii</i>	0.17	0.41				
<i>Odonthalia kamschatica</i>			0.42	0.80		
<i>Palmaria callophyloides</i>	3.00	4.56	11.50	19.50	2.42	3.07
<i>Palmaria hecatensis</i>	18.50	16.43	26.83	28.04	12.17	11.62
<i>Palmaria mollis</i>	0.92	2.01	0.83	1.33		
<i>Petrocelis</i> sp.	0.08	0.20				
<i>Pilayella littoralis</i>	0.08	0.20	0.08	0.20		
<i>Porphyra aestivalis</i>	1.67	2.66				
<i>Porphyra cuneiformis</i>	0.08	0.20	0.67	1.63		
<i>Pterosiphonia bipinnata</i>			1.50	3.21		
<i>Ralfsia fungiformis</i>	0.50	0.84	0.67	1.21	3.00	3.10
<i>Ralfsia</i> sp.	0.67	1.63	1.83	1.94		
<i>Saccharina</i> sp.	15.83	28.36	11.67	20.41		
<i>Saccharina subsimplex</i>	8.83	11.75	27.83	19.40	3.83	8.01
<i>Tokidadendron</i> sp.			0.50	1.22		
<i>Ulva</i> sp.	0.42	0.20	2.58	1.96		
<i>Ulva/Ulvaria</i> sp.					0.17	0.26
<i>Ulvaria</i> sp.			0.67	1.63		
Total Algal Cover (ex. Diatoms)	88.92	22.23	143.08	75.96	83.75	25.14

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Report J-1 Table 2 continued
 Macrobiota at Port Site 1 - Lower Tidal Elevation;
 2004-2006

Species	Lower Elevation					
	Aug 2004		Jul 2005		Apr 2006	
	n = 6		n = 6		n = 6	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)						
<i>Abietinaria</i> sp.			1.17	1.83		
Anemone					0.50	1.22
<i>Buccinum baeri</i>					0.17	0.41
<i>Cancer oregonensis</i>	0.17	0.41				
Cucumber, creamy	0.17	0.41				
Gray-orange anemone	0.17	0.41				
<i>Henricia leviuscula</i>	0.17	0.41				
<i>Hiatella arctica</i>			0.17	0.41		
<i>Lacuna</i> sp.	present not counted				0.50	0.84
<i>Leptasterias</i> sp.	0.17	0.41	0.83	0.98		
<i>Littorina sitkana</i>			0.17	0.41		
<i>Lottia pelta</i>	0.17	0.41				
<i>Margarites pupillus</i>	0.33	0.52	0.17	0.41	1.67	2.88
<i>Metridium senile</i>			0.33	0.52		
<i>Mopalia</i> sp.			0.33	0.52	0.17	0.41
<i>Nucella lamellosa</i>			2.17	2.71	0.17	0.41
Orange sponge	0.92	1.28				
<i>Pagurus beringanus</i>	2.00	1.67	1.17	1.17		
<i>Pagurus hirsutiusculus</i>	2.17	1.33	2.17	2.71	0.33	0.82
<i>Pagurus</i> sp.					0.17	0.41
<i>Pugettia gracilis</i>	0.50	0.84				
<i>Serpula vermicularis serpulidae</i>	0.08	0.20				
Sertulariidae hydroid	0.33	0.52				
<i>Tectura scutum</i>	0.17	0.41				
<i>Tonicella lineata</i>	0.50	0.84	3.50	3.39	1.67	3.61
<i>Trichotropis insignis</i>			0.17	0.41		
<i>Urticina crassicornis</i>	0.17	0.41	0.17	0.41	0.83	0.98
White anemone (<i>Cnidopus</i> sp.?)			0.50	0.55		
Animal Area Cover (%)						
Ascidian (colonial)			1.50	3.21	0.92	2.01
<i>Balanus</i> sp.					0.17	0.26
<i>Nucella</i> eggs			1.17	1.17		
Porifera, orange					0.08	0.20
Spirorbidae (unid.)					0.25	0.27

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Report J-1 Table 3

Macrobiota at Port Site 1A - Upper Tidal Elevation; 2004-2006

Species	Upper Elevation					
	Aug 2004		Jul 2005		Apr 2006	
	n = 10		n = 10		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Analipus japonicus</i>	0.15	0.34				
Articulated coralline algae					0.20	0.63
<i>Bangia</i>			0.05	0.16		
Black crust			0.10	0.32		
<i>Blidingia minima</i>			0.05	0.16		
Blue-green algae, crust					0.40	1.26
<i>Corallina frondescens</i>	0.05	0.16	0.20	0.63		
<i>Corallina vancouveriensis</i>	0.30	0.95			0.10	0.21
Diatoms					2.95	6.20
<i>Elachista fucicola</i>	0.15	0.34	0.60	1.07		
Encrusting coralline algae	0.80	1.14	0.10	0.32	1.90	3.41
Encrusting red algae	0.40	0.70				
Filamentous green algae					16.60	23.02
<i>Fucus distichus</i> ssp. <i>evanescens</i>	14.80	14.09	33.50	35.90	5.50	7.44
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)	0.15	0.34			0.05	0.16
<i>Halosaccion glandiforme</i>	0.30	0.42	0.10	0.21	0.35	0.34
<i>Hildenbrandia rubra</i>	1.60	3.10	1.05	1.12		
<i>Leathesia difformis</i>	0.05	0.16	0.85	1.43		
<i>Mastocarpus papillatus</i>			0.20	0.42	1.35	3.11
<i>Mazzaella</i> sp.	0.95	2.50	0.80	2.53		
<i>Neorhodomela larix</i>					4.80	6.14
<i>Neorhodomela oregona</i>	13.85	17.72	14.10	19.44		
<i>Petalonia</i> sp.					0.05	0.16
<i>Porphyra aestivalis</i>	0.45	0.64	0.95	1.55		
<i>Pterosiphonia bipinnata</i>	0.40	0.66	0.15	0.34		
<i>Ralfsia</i> sp.			0.10	0.32		
<i>Saccharina</i> sp.					0.10	0.32
<i>Soranthera ulvoidea</i>	3.90	5.07	2.45	2.75		
<i>Ulva linza</i>	0.30	0.95	0.40	0.46		
<i>Ulva</i> sp.	0.10	0.21	0.10	0.21		
<i>Ulva/Ulvaria</i> sp.					0.25	0.63
<i>Urospora</i> sp.			0.05	0.16		
Total Algal Cover (ex. Diatoms)	38.70	25.74	55.90	42.86	31.65	28.56

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Report J-1 Table 3 continued
 Macrobiota at Port Site 1A - Upper Tidal
 Elevation; 2004-2006

Species	Upper Elevation					
	Aug 2004		Jul 2005		Apr 2006	
	n = 10		n = 10		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)						
<i>Littorina sitkana</i>	73.60	40.04	109.90	75.93	145.10	124.49
<i>Lottia pelta</i>	2.10	2.92	0.30	0.67	0.10	0.32
Lottiidae	6.60	11.99	11.90	6.08	3.40	2.22
<i>Nucella lima</i>	2.10	3.70	3.60	2.67	0.70	1.25
<i>Onchidella borealis</i>			0.10	0.32		
<i>Pagurus hirsutiusculus</i>	2.90	3.07	3.50	2.80	0.20	0.63
<i>Pagurus</i> sp.			0.10	0.32		
<i>Tectura scutum</i>	0.30	0.48	0.60	1.07		
<i>Trichotropis insignis</i>			0.10	0.32		
Animal Area Cover (%)						
<i>Abietinaria</i> sp.					2.50	2.11
<i>Balanus glandula</i>					0.10	0.21
<i>Chthamalus dalli</i>	8.35	9.76	12.15	11.74	0.35	0.67
<i>Chthamalus dalli</i> (set)	0.05	0.16				
<i>Halichondria panicea</i>	1.50	3.17	0.85	2.19		
<i>Mytilus</i> sp.			0.15	0.24		
<i>Mytilus</i> sp. (spat)			0.05	0.16		
<i>Nucella</i> eggs			0.10	0.32		
<i>Semibalanus balanoides</i>	3.15	3.56			0.10	0.21
<i>Semibalanus balanoides</i> (set)			3.95	7.45		
Dead Animals (%)						
<i>Balanus/Semibalanus</i> (dead)	0.25	0.63				
<i>Chthamalus dalli</i> (dead)	0.20	0.35			4.30	5.94
<i>Semibalanus balanoides</i> (dead)	0.15	0.24			1.40	3.75
<i>Semibalanus cariosus</i> (dead)					0.05	0.16

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Report J-1 Table 4

Macrobiota at Port Site 1A - Middle Tidal Elevation; 2004-2006

Species	Middle Elevation					
	Aug 2004 n = 10		Jul 2005 n = 7		Apr 2006 n = 5	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Acrosiphonia arcta</i>			8.14	13.31		
<i>Acrosiphonia coalita</i>			0.86	1.86		
<i>Acrosiphonia</i> sp.	1.50	1.70				
<i>Ahnfeltia fastigiata</i>	0.15	0.24				
Black crust			0.43	1.13		
Black-Green algal crust			1.57	1.40		
<i>Corallina</i> sp.					0.10	0.22
<i>Cryptosiphonia woodii</i>	0.50	0.94	1.79	2.71		
Diatoms					57.00	36.50
<i>Elachista fucicola</i>	0.45	0.64	0.07	0.19		
<i>Elachista lubrica</i>	0.10	0.32	0.07	0.19		
Encrusting coralline algae	0.20	0.42				
Encrusting green algae	1.20	1.03			2.70	4.27
Encrusting red algae	37.80	16.82	12.29	7.41	0.20	0.45
Filamentous green algae					14.40	7.37
<i>Fucus distichus</i> ssp. <i>evanescens</i>	46.20	30.03	20.64	20.75	5.50	4.36
<i>Halosaccion glandiforme</i>	0.80	0.54	1.64	2.17	0.40	0.22
<i>Mastocarpus papillatus</i>	0.35	0.67	0.57	0.98		
<i>Mazzaella parvula</i>			0.71	1.89		
<i>Mazzaella</i> sp.	1.10	1.66				
<i>Palmaria callophyloides</i>	5.00	6.63	10.43	9.98	2.00	1.00
<i>Palmaria hecatensis</i>	41.40	19.83	65.43	24.49	20.60	8.32
<i>Porphyra aestivalis</i>	0.75	0.79	0.50	1.12		
<i>Porphyra cuneiformis</i>			3.07	7.47		
<i>Pterosiphonia bipinnata</i>	0.55	0.96	1.57	1.27		
<i>Rhodomela tenuissima</i>	0.10	0.21				
<i>Saccharina subsimplex</i>			1.14	3.02		
<i>Ulva linza</i>			0.79	0.91		
<i>Ulva</i> sp.	0.40	0.39	0.50	0.71		
<i>Ulva/Ulvaria</i> sp.					0.10	0.22
Total Algal Cover (ex. Diatoms)	138.55	29.09	132.21	65.12	46.00	18.16

Report J-1 Table 4 continued
 Macrobiota at Port Site 1A - Middle Tidal
 Elevation; 2004-2006

Middle Elevation

Species	Aug 2004		Jul 2005		Apr 2006	
	n = 10		n = 7		n = 5	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)						
Arborescent bryozoan			0.07	0.19		
<i>Henricia</i> sp.			0.14	0.38		
<i>Henricia tumida</i>	0.10	0.32				
<i>Lacuna</i> sp.	186.50	117.98				
<i>Leptasterias</i> sp.	0.20	0.63				
<i>Lottia pelta</i>			0.14	0.38		
Lottiidae	0.10	0.32	0.43	1.13		
Lottiidae (juv.)	0.10	0.32				
<i>Nucella lima</i>			0.29	0.49		
<i>Pagurus hirsutiusculus</i>	0.20	0.42	0.29	0.49		
<i>Pugettia gracilis</i>			0.14	0.38		
<i>Tectura scutum</i>	0.20	0.63	0.29	0.76		
<i>Telmessus cheiragonus</i>			0.14	0.38		
<i>Tonicella lineata</i>	0.20	0.63	0.14	0.38		
Animal Area Cover (%)						
<i>Abietinaria</i> sp.					0.10	0.22
<i>Balanus</i> sp.	3.80	6.31				
<i>Balanus/Semibalanus</i> (set)			7.86	12.63		
Encrusting bryozoan			0.43	0.79		
<i>Halichondria panicea</i>	9.60	8.68	14.29	19.24		
<i>Rhynchozoon bispinosum</i>	0.50	0.47	0.14	0.38		

Report J-1 Table 5

Macrobiota at Port Site 2 - Upper and Middle Tidal Elevations; 2004-2005

Species	Upper Elevation		Middle Elevation			
	Jul 2005		Aug 2004		Jul 2005	
	n = 5		n = 5		n = 5	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
Black-Green algal crust	1.00	1.70				
<i>Codiolum</i> sp.	0.10	0.22				
Encrusting coralline algae	0.10	0.22				
<i>Fucus distichus</i> ssp. <i>evanescens</i>	11.10	16.65	0.10	0.22		
<i>Hildenbrandia rubra</i>	1.60	1.78	0.10	0.22	0.10	0.22
<i>Neorhodomela oregona</i>	0.70	1.30	14.20	15.02	8.00	5.70
<i>Pterosiphonia bipinnata</i>			1.80	2.49	19.60	24.46
<i>Soranthera ulvoidea</i>			0.50	0.35	0.20	0.27
Total Algal Cover	14.60	15.59	16.70	14.71	27.90	23.39
Animals (#/0.25m²)						
<i>Abarenicola</i> (casts)			1.00	0.71		
<i>Anthophleura artemisia</i>	0.20	0.45			0.20	0.45
<i>Littorina sitkana</i>	234.60	47.24	51.80	28.10	17.40	12.18
<i>Littorina sitkana</i> (juv.)	5.20	10.55				
<i>Lottia pelta</i>	0.60	1.34				
Lottiidae	13.00	8.60	27.00	16.45	42.80	19.41
<i>Nucella lima</i>	0.20	0.45	9.20	11.34	1.60	2.07
<i>Pagurus hirsutiusculus</i>	0.20	0.45	11.80	17.04	3.20	3.27
Pholidae			0.40	0.55		
Animals (% cover)						
<i>Balanus crenatus</i>			0.20	0.45		
<i>Balanus rostratus</i>			0.10	0.22		
<i>Balanus/Semibalanus</i> spp.			0.50	0.35		
<i>Chthamalus dalli</i>	0.40	0.22	8.60	6.88	11.40	8.62
<i>Mytilus</i> sp.	1.40	1.47				
<i>Mytilus</i> sp. (spat)	0.10	0.22			0.10	0.22
<i>Nucella</i> eggs			0.20	0.27	0.30	0.45
<i>Semibalanus balanoides</i>	52.40	26.60	0.20	0.45	1.90	2.38
<i>Semibalanus balanoides</i> (set)	2.90	2.13			0.70	0.84
Dead Animals (%)						
<i>Balanus/Semibalanus</i> (dead)					0.20	0.45

Report J-1 Table 6

Macrobiota at Port Site 3 - Upper and Middle Tidal Elevations; 2004-2005

Species	Upper Elevation		Middle Elevation			
	Jul 2005		Aug 2004		Jul 2005	
	n = 5		n = 10		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Acrosiphonia</i> sp.			0.15	0.34		
<i>Ceramium cimbricum</i>			0.05	0.16		
<i>Chaetomorpha</i> sp.			0.30	0.95	0.05	0.16
<i>Cryptosiphonia woodii</i>			0.10	0.32		
<i>Elachista fucicola</i>					0.05	0.16
Encrusting coralline algae			1.10	1.85	0.40	0.84
Encrusting red algae	6.00	3.81	0.50	1.58		
<i>Fucus distichus</i> ssp. <i>evanescens</i>	31.60	10.50	38.20	22.30	64.30	16.68
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)	0.10	0.22				
<i>Halosaccion glandiforme</i>			0.65	1.56	0.65	1.33
<i>Hildenbrandia rubra</i>			0.75	1.32	1.10	1.66
<i>Leathesia difformis</i>			0.05	0.16		
<i>Mastocarpus papillatus</i>	0.10	0.22				
<i>Mazzaella</i> sp.			0.80	1.32	0.35	0.63
<i>Neorhodomela aculeata</i>	0.40	0.89	5.80	12.55	11.40	17.85
<i>Neorhodomela oregona</i>			9.70	13.07	1.25	3.78
<i>Palmaria callophylloides</i>			0.30	0.95	0.20	0.63
<i>Porphyra aestivalis</i>					0.65	1.33
<i>Porphyra cuneiformis</i>					0.05	0.16
<i>Pterosiphonia bipinnata</i>			0.45	0.96	0.35	0.67
<i>Ralfsia</i> sp.			0.05	0.16	0.10	0.32
<i>Soranthera ulvoidea</i>			3.80	6.52	2.20	3.43
<i>Sphacelaria rigidula</i>					0.05	0.16
<i>Ulva</i> sp.			0.25	0.63	1.10	3.14
Total Algal Cover	38.20	21.37	63.00	26.02	84.25	24.71

Report J-1 Table 6 continued
 Macrobiota at Port Site 3 - Upper and Middle
 Tidal Elevations; 2004-2005

Species	Upper Elevation		Middle Elevation			
	Jul 2005		Aug 2004		Jul 2005	
	n = 5		n = 10		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)						
<i>Clinocardium</i> sp.					0.10	0.32
Gammaridea			0.05	0.16		
<i>Lacuna</i> sp.			0.10	0.32		
<i>Littorina sitkana</i>	183.80	79.37	174.30	82.29	43.70	22.88
<i>Littorina sitkana</i> (egg cases)			0.10	0.32		
<i>Lottia pelta</i>			0.40	0.52	0.30	0.48
Lottiidae	5.20	2.28	18.60	10.16	19.90	7.59
<i>Nucella lima</i>	4.40	5.59	14.00	11.17	10.10	14.22
<i>Pagurus hirsutiusculus</i>	1.00	1.73	6.50	10.06	7.00	4.32
<i>Pholid/Stuhard</i>			0.10	0.32		
<i>Tectura persona</i>	0.20	0.45	0.10	0.32		
<i>Tectura scutum</i>					0.10	0.32
<i>Tonicella lineata</i>			0.10	0.32		
Animals (% cover)						
<i>Alcyonidium</i> sp.					0.20	0.63
<i>Balanus crenatus</i>			0.05	0.16		
<i>Balanus glandula</i>	0.10	0.22				
<i>Chthamalus dalli</i>	1.00	0.61	8.95	9.93	6.30	8.14
<i>Halichondria panicea</i>			0.80	2.53	3.30	6.46
<i>Mytilus</i> sp.	0.10	0.22				
<i>Mytilus</i> sp. (spat)	0.20	0.27				
<i>Semibalanus balanoides</i>	48.80	25.60	33.50	27.94	19.45	25.46
<i>Semibalanus balanoides</i> (set)					7.50	11.61
Dead Animals (%)						
<i>Balanus/Semibalanus</i>			0.35	0.47		
<i>Chthamalus dalli</i>			0.20	0.42		
<i>Semibalanus balanoides</i>			0.40	0.70		

Report J-1 Table 7
 Macrobiota at Port Site 3 - Lower Tidal Elevation; 2004-2005

Species	Lower Elevation			
	Aug 2004		Jul 2005	
	n = 10		n = 10	
	Mean	S.D.	Mean	S.D.
Plants (% cover)				
<i>Acrosiphonia arcta</i>			3.70	4.85
<i>Acrosiphonia</i> sp.	0.80	1.60		
<i>Ceramium cimbricum</i>	0.25	0.35	0.10	0.32
<i>Cryptosiphonia woodii</i>			0.10	0.32
<i>Elachista fucicola</i>	0.60	1.24	0.45	1.26
Encrusting red algae	8.00	10.78	14.20	12.30
<i>Fucus distichus</i> ssp. <i>evanescens</i>	15.25	16.95	15.00	19.96
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)	0.15	0.24	0.05	0.16
<i>Halosaccion glandiforme</i>			1.75	4.70
<i>Mastocarpus papillatus</i>			0.15	0.34
<i>Mazzaella</i> sp.	1.10	1.65	2.30	3.68
<i>Neorhodomela oregona</i>			0.05	0.16
<i>Palmaria callophyloides</i>	7.50	9.42	8.20	11.64
<i>Palmaria hecatensis</i>	1.55	2.93	1.60	3.34
<i>Polysiphonia pacifica</i>	0.35	0.94		
<i>Polysiphonia</i> sp.			0.60	1.58
<i>Polysiphonia/Pterosiphonia</i>	1.20	2.70		
<i>Porphyra aestivalis</i>	0.55	1.26	2.40	5.56
<i>Porphyra cuneiformis</i>			2.80	3.99
<i>Pterosiphonia bipinnata</i>	0.30	0.67	1.30	1.57
Red film	5.80	9.65		
<i>Rhodochorton purpureum</i>	2.25	4.98	2.40	6.31
<i>Rhodomela</i> sp.			0.05	0.16
<i>Saccharina</i> sp. (juv.)			0.10	0.32
<i>Scytosiphon</i> sp.			0.05	0.16
<i>Soranthra ulvoidea</i>			0.05	0.16
<i>Sphacelaria rigidula</i>	1.15	3.13	2.80	8.51
<i>Ulva linza</i>	0.40	0.94	7.00	9.10
<i>Ulva</i> sp.	1.45	3.07	0.65	0.82
Total Algal Cover	48.65	43.97	67.85	38.08

Report J-1 Table 7 continued
 Macrobiota at Port Site 3 - Lower Tidal
 Elevation; 2004-2005

Species	Lower Elevation			
	Aug 2004		Jul 2005	
	n = 10		n = 10	
	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)				
<i>Amphiporus</i> sp.			0.10	0.32
<i>Anthopleura elegantissima</i>			0.10	0.32
Clam shows			0.60	1.90
<i>Clinocardium nuttallii</i>	0.10	0.32		
Gammaridea	present not counted			
<i>Lacuna</i> sp.	1.10	2.51		
<i>Leptasterias</i> sp.	0.10	0.32	0.40	0.52
Lottiidae	1.10	2.60		
<i>Nucella lima</i>	0.10	0.32		
<i>Pagurus hirsutiusculus</i>	3.30	2.36	2.20	1.99
<i>Paranemertes peregrina</i>			0.10	0.32
Pholidae			0.10	0.32
Polyclad worm			0.20	0.42
<i>Pugettia gracilis</i>			0.10	0.32
<i>Scrupocellaria californica</i>			0.05	0.16
<i>Tectura scutum</i>	0.20	0.42	0.80	2.20
Animals (% cover)				
<i>Balanus crenatus</i>	3.40	6.29	0.15	0.34
<i>Balanus/Semibalanus</i> (set)			12.90	18.88
<i>Chthamalus dalli</i>	1.40	1.70	0.55	1.26
<i>Chthamalus dalli</i> (set)	0.10	0.21		
Encrusting bryozoan	0.40	1.26	0.65	0.94
<i>Halichondria panicea</i>	9.00	18.25	19.10	10.02
<i>Semibalanus balanoides</i>	7.10	22.10	1.90	4.65
<i>Semibalanus balanoides</i> (set)	8.35	25.18	0.05	0.16
Dead Animals (%)				
<i>Balanus crenatus</i> (dead)			0.20	0.42

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Report J-1 Table 8

Macrobiota at Port Site 4 - Upper and Middle Tidal Elevations; 2004-2005

Species	Upper Elevation		Middle Elevation			
	Jul 2005		Aug 2004		Jul 2005	
	n = 5		n = 10		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Acrosiphonia arcta</i>					7.45	10.42
<i>Acrosiphonia</i> sp.			2.15	3.00		
Black-Green algal crust	0.30	0.45				
<i>Chaetomorpha</i> sp.	0.10	0.22				
<i>Codiolum</i> sp.	0.20	0.45				
Diatoms			4.55	4.90		
<i>Elachista fucicola</i>			0.35	0.67		
Encrusting red algae			4.80	6.12	17.30	9.52
<i>Fucus distichus</i> ssp. <i>evanescens</i>	33.00	15.25	13.00	11.92	37.30	30.30
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)			3.20	6.10	0.05	0.16
<i>Halosaccion firmum</i>			0.10	0.32		
<i>Halosaccion glandiforme</i>					0.10	0.32
<i>Hildenbrandia rubra</i>	2.70	1.64				
<i>Laminaria groenlandica</i>					4.50	14.23
<i>Laminaria</i> sp.			0.05	0.16	0.30	0.95
<i>Laminaria</i> (juv.)			0.75	2.20		
<i>Mazzaella</i> sp.			0.50	1.08	0.20	0.42
<i>Neorhodomela oregona</i>			0.05	0.16		
<i>Palmaria callophyloides</i>			4.95	6.57	5.30	5.74
<i>Palmaria hecatensis</i>			1.05	1.38	0.95	1.26
<i>Palmaria mollis</i>			0.20	0.63	0.10	0.32
<i>Porphyra aestivalis</i>					1.15	1.83
<i>Porphyra cuneiformis</i>			0.10	0.32	2.50	3.14
<i>Ralfsia</i> sp.					0.05	0.16
<i>Rhodochorton purpureum</i>					2.55	5.38
<i>Rhodomela tenuissima</i>					0.10	0.32
<i>Ulva linza</i>			1.75	3.14	5.40	4.33
<i>Ulva</i> sp.			2.40	2.91		
<i>Ulvaria</i> sp.					0.20	0.63
<i>Verrucaria</i> sp.	4.00	8.94				
Total Algal Cover (ex. Diatoms)	40.30	24.44	35.40	17.72	85.50	21.08

Report J-1 Table 8 continued
 Macrobiofa at Port Site 4 - Upper and Middle
 Tidal Elevations; 2004-2005

Species	Upper Elevation		Middle Elevation			
	Jul 2005		Aug 2004		Jul 2005	
	n = 5		n = 10		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)						
Gammaridea	0.20	0.45				
<i>Lacuna</i> sp.			0.50	1.58		
<i>Leptasterias</i> sp.					0.10	0.32
<i>Littorina sitkana</i>	206.80	66.08				
<i>Lottia pelta</i>	0.20	0.45				
Lottiidae	7.00	3.39	0.30	0.95	0.60	1.90
<i>Nucella lima</i>	1.80	2.17				
<i>Pagurus hirsutiusculus</i>			0.50	0.53	1.10	0.74
Pholidae (juv.)	0.20	0.45				
<i>Pholis</i> sp.			0.10	0.32		
<i>Tectura scutum</i>					0.30	0.67
<i>Tonicella lineata</i>					0.10	0.32
Animals (% cover)						
<i>Balanus/Semibalanus</i> (set)			1.20	1.30		
<i>Chthamalus dalli</i>	2.50	4.21	0.50	1.27		
Encrusting bryozoan			0.05	0.16		
<i>Halichondria panicea</i>			3.65	5.11		
<i>Mytilus</i> sp.	0.30	0.27				
<i>Rhynchozoon bispinosum</i>			0.30	0.95		
<i>Semibalanus balanoides</i>	21.60	15.57	0.20	0.35		
<i>Semibalanus balanoides</i> (set)	2.70	2.05				
Dead Animals (%)						
<i>Semibalanus balanoides</i> (dead)			0.15	0.24		

Report J-1 Table 9

Macrobiota at Port Site 4 - Lower Tidal Elevation; 2004-2005

Species	Lower Elevation			
	Aug 2004		Jul 2005	
	n = 10		n = 10	
	Mean	S.D.	Mean	S.D.
Plants (% cover)				
<i>Acrosiphonia arcta</i>			11.60	7.76
<i>Acrosiphonia</i> sp.	5.45	5.80		
Articulated coralline algae	0.30	0.67		
Black crust			1.00	3.16
<i>Desmarestia aculeata</i>	0.10	0.32		
Diatoms	4.55	4.90		
<i>Elachista fucicola</i>	0.05	0.16		
Encrusting coralline algae	0.10	0.32	0.10	0.21
Encrusting red algae	5.60	5.72	14.60	10.24
<i>Fucus distichus</i> ssp. <i>evanescens</i>	27.70	19.22	37.90	20.81
<i>Halosaccion firmum</i>	0.15	0.34		
<i>Mastocarpus</i> sp.			0.10	0.32
<i>Mazzaella</i> sp.	1.50	1.90	0.90	1.26
<i>Odonthalia kamschatica</i>	0.05	0.16		
<i>Palmaria callophyloides</i>	2.75	2.90	6.60	5.99
<i>Palmaria hecatensis</i>	5.80	7.77	6.00	7.18
<i>Palmaria mollis</i>	0.10	0.32		
<i>Phycodrys riggii</i>	0.80	1.32	0.30	0.67
Phylloporaceae (unid.)	0.70	1.64		
<i>Polysiphonia</i> sp.	0.25	0.42	0.65	1.06
<i>Porphyra aestivalis</i>			1.60	1.65
<i>Porphyra cuneiformis</i>	0.35	0.67	13.60	6.52
Purple crust			1.00	3.16
<i>Rhodochorton purpureum</i>			0.15	0.34
<i>Saccharina groenlandica</i>	0.40	1.26		
<i>Saccharina</i> sp.	1.70	3.95	11.70	12.16
<i>Saccharina</i> (juv.)	0.20	0.26		
<i>Sphacelaria rigidula</i>	0.10	0.32		
<i>Ulva linza</i>	0.80	1.53	4.40	4.22
<i>Ulva</i> sp.	1.10	1.07	1.60	2.46
Total Algal Cover (ex. Diatoms)	56.05	20.62	113.80	18.63

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Report J-1 Table 9 continued
 Macrobiota at Port Site 4 - Lower Tidal
 Elevation; 2004-2005

Species	Lower Elevation			
	Aug 2004		Jul 2005	
	n = 10		n = 10	
	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)				
<i>Haliclystus</i> sp.	0.10	0.32		
<i>Lacuna</i> sp.	12.10	16.86	0.75	1.48
<i>Leptasterias</i> sp.			0.20	0.42
<i>Leptasterias</i> sp. (juv.)	0.10	0.32		
Lottiidae (juv.)	0.10	0.32		
<i>Pagurus beringanus</i>	0.10	0.32	0.10	0.32
<i>Pagurus hirsutiusculus</i>	0.50	0.71	0.50	0.97
<i>Pholis laeta</i>			0.20	0.63
<i>Scrupocellaria californica</i>			4.50	3.03
<i>Tectura scutum</i>	0.10	0.32	0.10	0.32
<i>Telmessus cheiragonus</i>			0.20	0.42
Animals (% cover)				
<i>Balanus crenatus</i>	0.05	0.16		
<i>Balanus</i> sp.	2.50	5.40		
<i>Balanus</i> / <i>Semibalanus</i> (set)	2.30	3.59	1.25	1.65
<i>Chthamalus dalli</i> (set)	0.30	0.35		
Encrusting bryozoan	0.35	0.94	0.55	0.69
<i>Garveia</i> sp.	0.05	0.16		
<i>Halichondria panicea</i>	0.10	0.32	0.30	0.95
Hydroids % (? <i>Garveia</i> sp.)	0.90	1.07		
<i>Rhynchozoon bispinosum</i>			0.60	1.35
<i>Semibalanus balanoides</i> (set)			1.60	2.76
<i>Semibalanus cariosus</i> (set)	0.15	0.24		
Spirorbidae (unid.)			0.45	0.64

Report J-1 Table 10
 Macrobiota at MBS 1A - Upper Tidal Elevation; 2005

Species	Upper Elevation	
	Jul 2005	
	n = 5	
	Mean	S.D.
Plants (% cover)		
<i>Fucus distichus</i> ssp. <i>evanescens</i>	0.50	0.87
<i>Hildenbrandia rubra</i>	0.10	0.22
<i>Verrucaria</i> sp.	0.10	0.22
Total algal cover	0.70	0.67
Animals (#/0.25m²)		
<i>Littorina sitkana</i>	175.60	55.30
Lottiidae	0.80	1.79
Animals (% cover)		
<i>Balanus glandula</i>	0.10	0.22
<i>Chthamalus dalli</i>	6.80	3.70
<i>Semibalanus balanoides</i>	43.40	18.01
<i>Semibalanus balanoides</i> (set)	2.00	2.74

Report J-1 Table 11

Macrobiofa at Scott Island - Upper Tidal Elevation; 2004-2006

Species	Sep 2004		Jul 2005		Apr 2006	
	n = 8		n = 5		n = 10	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
	Plants (% cover)					
Black-Green algal crust			0.10	0.22		
<i>Elachista fucicola</i>	0.06	0.18				
Encrusting coralline algae					10.40	14.47
Encrusting green algae	1.25	3.54				
Encrusting red algae	27.50	14.39	7.60	10.31	3.70	4.32
Filamentous green algae			0.10	0.22		
<i>Fucus distichus</i> ssp. <i>evanescens</i>	37.50	28.58	49.00	12.45	19.00	8.55
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)	0.06	0.18			0.05	0.16
<i>Halosaccion glandiforme</i>	0.13	0.23				
<i>Hildenbrandia rubra</i>			8.40	15.18		
<i>Mastocarpus papillatus</i>	2.13	1.96	1.60	1.82	0.60	0.39
<i>Mazzaella</i> sp.	0.06	0.18				
<i>Melanosiphon intestinalis</i>			0.20	0.45		
<i>Neorhodomela larix</i>					6.55	10.70
<i>Neorhodomela oregona</i>	11.06	10.92	7.40	7.67		
<i>Pterosiphonia bipinnata</i>	0.06	0.18	0.70	1.30		
<i>Sorantthera ulvoidea</i>	8.25	8.68	1.60	1.52		
<i>Ulothrix</i> sp.			0.10	0.22		
<i>Ulva linza</i>	2.50	7.07				
Total Algal Cover	90.56	32.60	76.80	42.16	40.30	12.32
Animals (#/0.25m²)						
<i>Lacuna</i> sp.	1.88	5.30				
<i>Littorina sitkana</i>	40.00	32.54	7.80	6.30	123.60	30.63
Lottiidae	0.75	0.71	3.60	3.78	2.20	2.20
<i>Nucella lima</i>			0.40	0.55	0.50	0.85
<i>Pagurus hirsutiusculus</i>	3.13	4.64	3.00	2.92		
<i>Pagurus</i> sp.			0.20	0.45		
Animal Area Cover (%)						
<i>Balanus glandula</i>					0.05	0.16
<i>Balanus/Semibalanus</i> (set)	0.06	0.18				
<i>Chthamalus dalli</i>	1.81	1.07	0.80	1.30		
<i>Semibalanus balanoides</i>	1.13	0.92	0.80	0.27	8.40	8.76
<i>Semibalanus balanoides</i> (set)			10.30	14.25		
<i>Semibalanus cariosus</i>					0.05	0.16
Dead Animals (%)						
<i>Balanus/Semibalanus</i> (dead)	0.19	0.37				
<i>Chthamalus dalli</i> (dead)	0.25	0.46			0.65	0.91
<i>Semibalanus balanoides</i> (dead)					0.35	0.47

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Report J-1 Table 12

Macrobota at Scott Island - Middle Tidal Elevation; 2004-2006

Species	Sep 2004		Jul 2005		Apr 2006	
	n = 8		n = 6		n = 7	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Acrosiphonia arcta</i>	0.06	0.18				
<i>Acrosiphonia</i> sp.					0.29	0.76
Black-Green algal crust			3.67	3.60		
<i>Cryptosiphonia woodii</i>	0.19	0.26	0.17	0.41		
Diatoms					32.14	18.45
<i>Elachista fucicola</i>	4.63	2.62	8.00	4.15		
Encrusting coralline algae	0.31	0.70				
Encrusting green algae	2.25	3.24			0.14	0.38
Encrusting red algae	8.75	9.00	5.17	3.97		
Filamentous green algae			0.17	0.41	2.21	2.64
<i>Fucus distichus</i> ssp. <i>evanescens</i>	58.75	19.23	81.17	14.01	8.43	6.11
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)	0.13	0.35				
<i>Halosaccion glandiforme</i>	1.44	0.94	0.83	0.68	0.43	0.45
<i>Hildenbrandia rubra</i>	0.25	0.71				
<i>Mastocarpus papillatus</i>					0.36	0.48
<i>Mazzaella phyllocarpa</i>			2.17	1.17		
<i>Mazzaella</i> sp.	7.13	4.22			0.14	0.38
<i>Monostroma grevillei</i>	0.13	0.23	0.08	0.20		
<i>Neorhodomela aculeata</i>	0.25	0.71				
<i>Neorhodomela larix</i>					0.07	0.19
<i>Palmaria callophyloides</i>	24.00	17.82	32.50	24.02	25.00	11.90
<i>Palmaria hecatensis</i>	28.13	4.05	30.17	11.92	40.71	13.67
<i>Pilayella littoralis</i>	0.13	0.35				
<i>Porphyra aestivalis</i>	2.00	3.41	1.08	1.96		
<i>Porphyra cuneiformis</i>			1.67	3.20		
<i>Pterosiphonia bipinnata</i>	0.25	0.71	0.42	0.80		
<i>Ralfsia</i> sp.			0.08	0.20		
<i>Ulva linza</i>	0.88	1.69	1.33	1.17		
<i>Ulva</i> sp.	1.19	1.31	1.08	1.96		
<i>Ulva/Ulvaria</i> sp.					1.14	1.18
Total Algal Cover (ex. Diatoms)	140.81	16.07	169.75	89.19	78.93	12.88

Report J-1 Table 12 continued

Macrobiofa at Scott Island - Middle Tidal Elevation; 2004-2006

Species	Sep 2004		Jul 2005		Apr 2006	
	n = 8		n = 6		n = 7	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Animals (#/0.25m²)						
<i>Lacuna</i> sp.	7.50	8.96				
<i>Leptasterias</i>	0.13	0.35				
<i>Nucella lima</i>	0.13	0.35				
<i>Pagurus beringanus</i>			0.17	0.41		
<i>Pagurus hirsutiusculus</i>	0.88	1.13	1.67	0.82		
<i>Pagurus</i> sp.					0.14	0.38
<i>Pugettia gracilis</i>	0.13	0.35				
Animal Area Cover (%)						
<i>Balanus crenatus</i>	1.56	1.08				
<i>Balanus/Semibalanus</i> (set)			1.42	0.92		
Encrusting bryozoan	0.13	0.35	0.08	0.20		
<i>Halichondria panicea</i>	7.13	6.64	7.42	9.08		
<i>Semibalanus balanoides</i>	0.25	0.27				

Report J-1 Table 13

Macrobiota at Scott Island - Lower Tidal Elevation; 2004-2006

Species	Sep 2004		Jul 2005		May 2006	
			(not observed)			
	n = 5		n = 0		n = 5	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Plants (% cover)						
<i>Acrosiphonia</i> sp.	0.50	0.87			0.70	1.30
<i>Alaria taeniata</i>	2.00	4.47				
<i>Bossiella</i> sp.					0.30	0.27
<i>Constantinea subulifera</i>	0.60	1.34			1.10	1.67
<i>Corallina frondescens</i>	1.60	2.04				
<i>Corallina officinalis</i> var. <i>chilensis</i>	0.20	0.45				
<i>Cryptosiphonia woodii</i>					0.80	0.84
Diatoms					1.80	1.79
<i>Elachista fucicola</i>	0.20	0.45				
Encrusting coralline algae	10.20	11.45			2.80	3.11
Encrusting green algae	0.20	0.45				
Encrusting red algae	1.60	3.58				
Filamentous green algae					0.10	0.22
Filamentous red algae					0.30	0.45
<i>Fucus distichus</i> ssp. <i>evanescens</i>	11.00	14.68			9.00	11.00
<i>Fucus distichus</i> ssp. <i>evanescens</i> (germlings)	1.00	2.24				
<i>Halosaccion glandiforme</i>	1.70	1.20			1.80	1.92
<i>Leathesia difformis</i>	0.40	0.89				
<i>Mastocarpus papillatus</i>	1.80	3.03			4.90	3.68
<i>Mazzaella</i> sp.	3.50	3.46			2.60	3.29
<i>Neodilsea borealis</i>	0.80	1.79				
<i>Neorhodomela oregona</i>	0.30	0.45				
<i>Palmaria callophyloides</i>	5.20	3.83			3.40	1.52
<i>Palmaria hecatensis</i>	21.40	28.01			26.30	23.57
<i>Petalonia</i> sp.					0.20	0.27
<i>Phycodrys riggii</i>	1.00	1.41			0.40	0.89
<i>Pterosiphonia bipinnata</i>	0.20	0.45				
<i>Ralfsia fungiformis</i>	0.40	0.89			0.60	0.55
<i>Ralfsia</i> sp.	0.20	0.45			1.80	1.48
<i>Saccharina subsimplex</i>	31.00	28.81			21.60	19.37
<i>Saccharina latissima</i>					2.00	2.83
<i>Ulva linza</i>	1.50	2.12				
<i>Ulva</i> sp.	12.20	5.59				
<i>Ulva/Ulvaria</i> sp.					4.60	3.51
Total Algal Cover (ex. Diatoms)	110.70	23.07			85.30	13.95

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