

**PUGET SOUND BENTHIC COMMUNITY ASSESSMENT-JUNE
1998**

SUBMITTED TO

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE
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JANUARY 2001

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INTRODUCTION

The Puget Sound Estuary was sampled during June and July 1997 and June of 1998. This report is an assessment of the June 1998 collection. One aspect of this study was benthic community characterization, which was accomplished via sample collection by National Oceanic and Atmospheric Administration (NOAA) personnel and laboratory and data analysis by Barry A. Vittor & Associates, Inc. (BVA).

METHODS

Sample Collection And Handling

A Young dredge (area = 0.04 m²) was used to collect bottom samples at each of 31 strata locations (2 to 4 stations sampled per stratum) throughout southern Puget Sound. Samples were pre-screened through 1.0 and 0.5 mm mesh sieves, re-screened to remove formalin and preserved in 70% ethanol by the Washington State Department of Ecology's Marine Sediment Monitoring Unit. The preserved, 0.5 mm sample fractions were transported to Vittor & Associate's laboratory in Mobile, Alabama.

Macroinfaunal Sample Analysis

In the laboratory of BVA, benthic samples were inventoried, rinsed gently through a 0.5 mm mesh sieve to remove preservatives and sediment, stained with Rose Bengal, and stored in 70% isopropanol solution until processing. Sample material (sediment, detritus, organisms) was placed in white enamel trays for sorting under Wild M-5A dissecting microscopes. All macroinvertebrates were carefully removed with forceps and placed in labelled glass vials containing 70% isopropanol. Each vial represented a major taxonomic group (e.g. Polychaeta, Mollusca, Arthropoda). All sorted macroinvertebrates were identified to the lowest practical identification level (LPIL), which in most cases was to species level unless the specimen was a juvenile, damaged, or otherwise unidentifiable. The number of individuals of each taxon, excluding fragments, was recorded. A voucher collection was prepared, composed of representative individuals of each species not previously encountered in samples from the region.

DATA ANALYSIS

All data generated as a result of laboratory analysis of macroinfauna samples were first coded on data sheets. Enumeration data were entered for each species according to station and replicate. These data were reduced to a data summary report for each station, which included a taxonomic species list and benthic community parameters information. Archive data files of species identification and enumeration were prepared.

The QA/QC reports for the Puget Sound samples are given in Appendices A1 and A2. Quality control comments on dominant LPIL taxa are given in Appendix A3.

Assemblage Structure

Several numerical indices were chosen for analysis and interpretation of the macroinfaunal data. Selection was based primarily on the ability of the index to provide a meaningful summary of data, as well as the applicability of the index to the characterization of the benthic community. Infaunal abundance is reported as the total number of individuals per station and the total number of individuals per square meter (= density). Taxa richness is reported as the total number of taxa represented in a given station collection.

Taxa diversity, which is often related to the ecological stability and environmental "quality" of the benthos, was estimated by the Pielou's Index (Pielou, 1966), according to the following formula:

$$H' = - \sum_{i=1}^S p_i (\ln p_i)$$

where, S = is the number of taxa in the sample,

i = is the i 'th taxon in the sample, and

p_i = is the number of individuals of the i 'th taxon divided by the total number of individuals in the sample.

Taxa diversity within a given community is dependent upon the number of taxa

present (taxa richness) and the distribution of all individuals among those taxa (equitability or evenness). In order to quantify and compare faunal equitability to taxa diversity for a given area, Pielou's Index J' (Pielou, 1966) was calculated as $J' = H'/\ln S$, where $\ln S = H'_{\max}$, or the maximum possible diversity, when all taxa are represented by the same number of individuals; thus, $J' = H' / H'_{\max}$.

HABITAT CHARACTERISTICS

Station location and identification for the June 1998 Puget Sound strata are provided in Table 1 and Figure 1. A station location map for the 1997 and 1998 Puget Sound strata is provided in Figure 2. Station locations for the 1998 strata are provided in Table 1. Sediment composition data were not provided to BVA at the time of the report, therefore sediment characteristics will not be presented.

BENTHIC COMMUNITY CHARACTERIZATION

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Table 2 provides a complete phylogenetic listing for all strata as well as data on taxa abundance and strata occurrence. Microsoft TMExcel spreadsheets are being provided separately to NOAA which include: raw data on taxa abundance and density by station, a complete taxonomic listing with strata abundance and occurrence and QA/QC comments, a major taxa table with overall taxa abundance, and an assemblage parameter table including data on mean number of taxa, mean density, taxa diversity and taxa evenness by station and stratum.

A total of 49,891 organisms, representing 495 taxa, were identified from the 31 strata (Table 3). Polychaetes were the most numerous organisms present representing 47% of the total assemblage, followed in abundance by malacostracans (22%) and bivalves (20%). Polychaetes represented 50% of the total number of taxa followed by malacostracans (31%) and bivalves (10%) (Table 3). The percentage abundance of the major taxa at the 31 strata is given in Table 4 and Figure 3.

The dominant taxa collected from the strata were the polychaetes, family

Cirratulidae (LPIL) and *Nephtys cornuta*, the malacostracan, *Eudorella pacifica*, and the bivalves, *Axinopsida serricata*, *Rocheportia tumida* and *Semele rubropicta* representing 9.7%, 8.2%, 5.0%, 4.9%, 4.1% and 4.0% of the total number of individuals, respectively (Table 2). The polychaete Family Cirratulidae (LPIL) were the most widely distributed taxon being found at 85% of the strata. The distribution of taxa representing > 10% of the total assemblage at each stratum is given in Table 5.

Station abundance and taxa data are summarized for the 31 strata in Table 6 and Figures 4 through 7. Mean density per stratum ranged from 3,275 organisms/m² (SD = 530.3) at Stratum 5 to 26,700 organisms/m² (SD = 8,967.6) at Stratum 32 (Table 6; Figures 4 and 5). The mean number of taxa per stratum ranged from 14.3 taxa/rep (SD = 4.2) at Stratum 13 to 79.7 taxa/rep (SD = 13.5) at Stratum 17 (Table 6; Figures 6 and 7).

Taxa diversity and evenness for the Puget Sound strata are given in Table 6 and Figures 8 through 11. Taxa diversity (H') varied considerably and ranged from 1.58 at Stratum 13 to 3.88 at Stratum 17 (Table 6; Figures 8 and 9). Taxa evenness (J') also exhibited considerable variation and ranged from 0.49 at Stratum 13 to 0.82 at Stratum 5 (Table 6; Figures 10 and 11).

LITERATURE CITED

Pielou, E.C. 1966. The measurement of diversity in different types of biological collections *Journal of Theoretical Biology* 13:131-144.

Table 1. Location data for the Puget Sound strata, June 1998.

Stratum No.	Station No.	Location	Station Location DGPS (Trimble NT300D) NAD 83, Decimal Minutes	
			Latitude	Longitude
1	106	Port Townsend Bay, Irondale	48 02.8153	122 45.8271
1	107	Port Townsend Bay, south	48 02.4102	122 44.6112
1	108	Port Townsend Bay, Walan Pt.	48 04.1881	122 45.9197
2	109	East of Port Townsend	48 06.6493	122 43.7254
2	110	East of Port Townsend	48 06.9001	122 43.4414
2	111	South of Port Townsend	48 06.1756	122 45.0007
4	116	Useless Bay, north	47 58.8913	122 30.2027
4	117	Useless Bay, south	47 57.8045	122 30.4770
4	112	East of Oak Bay	47 59.6249	122 40.6872
5	118	Possession Sound, east	47 54.4087	122 20.2104
5	119	East of Pilot Point	47 52.5708	122 28.9305
5	120	East of Pilot Point	47 52.3663	122 29.0968
6	121	North of Pt. Wells	47 47.3988	122 23.8904
6	122	Norhtwest of Meadow Pt.	47 42.5849	122 26.3592
6	123	Northwest of Pt. Wells	47 47.3109	122 24.8648
7	124	South Port Madison	47 42.8288	122 31.6393
7	125	West Port Madison	47 43.9833	122 32.2353
7	126	Port Madison	47 43.5620	122 31.8303
8	127	Southeast of Pt. Monroe	47 41.2105	122 27.9820
8	128	Northwest of Shilshole Bay	47 40.9650	122 26.6008
8	129	West of Shilshole Bay	47 40.4082	122 27.3889
8	113	Southeast of Pt. Monroe	47 41.1219	122 28.6614
9	130	Eagle Harbor, northeast	47 37.3660	122 30.0950
9	131	Eagle Harbor, south	47 37.0882	122 30.6499
9	132	Eagle Harbor, central	47 37.2555	122 30.4339
10	133	South of Manchester	47 32.6617	122 32.0799
10	134	Yukon Harbor	47 31.9061	122 31.3737
10	135	Southworth	47 31.0757	122 29.7035
11	136	East of Yeomalt Point	47 37.8017	122 28.1570
11	137	East of Eagle Harbor	47 36.7397	122 27.5746
11	138	Northeast of Vashon Is.	47 31.0872	122 26.2506

Table 1. Continued:

Stratum	Station No.	Location	Station Location DGPS (Trimble NT300D) NAD 83, Decimal Minutes	
			Latitude	Longitude
12	139	Northwest of Three-Tree Pt.	47 27.5742	122 23.9584
12	140	South of Three-Tree Pt.	47 25.6808	122 22.6849
12	141	West of Des Moines	47 24.0727	122 20.3352
13	142	Liberty Bay	47 43.3897	122 38.8212
13	143	Liberty Bay	47 43.2209	122 38.9393
13	144	Liberty Bay	47 43.3097	122 38.5268
14	145	Liberty Bay, Lemolo	47 42.8806	122 37.7592
14	146	Liberty Bay	47 43.1631	122 38.4778
14	147	West of Keyport	47 42.3907	122 38.1330
15	148	Southeast of Keyport	47 41.5765	122 36.6076
15	149	North Port Orchard, Pt. Bolin	47 41.3264	122 35.3354
15	150	North Port Orchard	47 40.8740	122 35.1297
16	151	East of Brownsville	47 38.9657	122 36.2096
16	152	Port Orchard, Illahee	47 36.1423	122 35.3440
16	153	Port Orchard	47 37.5503	122 34.8743
17	154	Rish Pass., Pleasant Beach	47 35.6053	122 32.2417
17	155	Rich Pass., Lynwood Center	47 36.0357	122 33.2248
17	156	Port Orchard, south	47 34.7533	122 35.0472
18	157	Port Orchard, East Bremerton	47 34.1432	122 36.1410
18	158	Port Orchard, south	47 34.1703	122 35.2386
18	159	Point Herron	47 33.9718	122 36.6535
19	160	Southwest Sinclair Inlet	47 32.0540	122 40.6130
19	161	Sinclair Inlet, Port Orchard	47 32.6240	122 38.4875
19	162	Sinclair Inlet	47 32.8345	122 38.4888
20	163	Sinclair Inlet	47 32.7429	122 39.2436
20	164	Sinclair Inlet, north shore	47 32.9401	122 39.9230
20	165	North Sinclair Inlet	47 32.8355	122 39.9860
21	166	Dyes Inlet, Tracyton	47 36.5333	122 39.8080
21	167	Phinney Bay	47 35.0836	122 39.7808
21	168	Phinney Bay	47 35.3011	122 39.5957
22	169	Dyes Inlet, S.E. of Silverdale	47 38.1431	122 40.7447
22	170	Dyes Inlet, north of Chico Bay	47 36.7847	122 42.0803
22	171	Dyes Inlet	47 37.6436	122 41.5139

Table 1. Continued:

Stratum Station		Station Location DGPS (Trimble NT300D)		
No.	No.	Location	NAD 83, Decimal Minutes	
			Latitude	Longitude
23	172	West of Duwamish Head	47 35.6641	122 24.7604
23	173	Northwest of Duwamish Head	47 36.2214	122 23.9676
23	174	Elliott Bay, S.E. of EB Marina	47 37.4875	122 23.9904
23	175	North of Alkai Point	47 34.8764	122 25.2086
24	176	Elliott Bay, west of EB Marina	47 37.7506	122 23.9458
24	177	Magnolia Bluff	47 37.9421	122 24.1667
24	178	Elliott Bay, south of EB Marina	47 37.5486	122 23.6142
25	179	Elliott Bay, west of Pier 86	47 37.4361	122 22.4457
25	180	Elliott Bay, Piers 89-90	47 37.4891	122 22.7205
25	181	Elliott Bay, west of Piers 70-71	47 36.9025	122 21.7381
25	115	Elliott Bay, east side Pier 90	47 37.6867	122 22.7625
26	182	Elliott Bay, west of Pier 54	47 36.2525	122 20.6480
26	183	Elliott Bay, Pier 54	47 36.2393	122 20.4248
26	184	Elliott Bay, Pier 55	47 36.2798	122 20.4594
27	185	Elliott Bay, N. of Duwamish Hd.	47 36.5983	122 22.9217
27	186	Elliott Bay, W. of Denny Way	47 37.0919	122 21.9206
27	187	Elliott Bay, west of Pier 59	47 36.4313	122 21.5396
27	188	Elliott Bay, west of Pier 57	47 36.3634	122 20.6347
28	189	Elliott Bay, E. of Duwamish Hd.	47 35.4307	122 22.8292
28	190	Elliott Bay, Duwamish Head	47 35.8295	122 23.1034
28	191	Elliott Bay, E. of Duwamish Hd.	47 35.9049	122 22.5499
28	192	Elliott Bay, central	47 36.1386	122 21.9568
29	193	Elliott Bay, west of Pier 48	47 35.9990	122 21.2517
29	194	Elliott Bay, west of Pier 48	47 36.0147	122 20.8404
29	195	Elliott Bay, west of Pier 48	47 35.9743	122 21.6628
29	196	Elliott Bay, west of Yesler Way	47 36.0719	122 20.9790
30	197	Elliott Bay, south	47 35.1816	122 21.8227
30	198	Elliott Bay, south	47 35.2934	122 21.9938
30	199	Elliott Bay, south	47 35.1995	122 21.9022
30	114	West Waterway, Terminal 5	47 34.5267	122 21.6423
31	200	East Waterway, Terminal 18	47 35.0786	122 20.7475
31	201	East Waterway, Pier 32	47 34.9573	122 20.6066
31	202	East Waterway, south end	47 34.4598	122 20.6004
32	203	Duwamish River, north	47 33.6831	122 20.8466
32	204	Duwamish River, north	47 33.6556	122 20.7059
32	205	Duwamish River, S.W. of Slip 2	47 32.7063	122 20.2129

Table 2. Abundance and distribution of taxa for the Puget Sound strata, June 1998.

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
Cirratulidae (LPIL)	Ann	Poly	4845	9.71	9.71	80	85
<i>Nephtys cornuta</i>	Ann	Poly	4072	8.16	17.87	77	82
<i>Eudorella pacifica</i>	Art	Mala	2468	4.95	22.82	69	73
<i>Axinopsida serricata</i>	Mol	Biva	2426	4.86	27.68	66	70
<i>Rochefortia tumida</i>	Mol	Biva	2046	4.10	31.78	65	69
<i>Semele rubropicta</i>	Mol	Biva	1949	3.91	35.69	54	57
<i>Alvania compacta</i>	Mol	Gast	1932	3.87	39.56	35	37
<i>Eudoretopsis</i> sp. A	Art	Mala	1339	2.68	42.25	18	19
<i>Pholoe glabra</i>	Ann	Poly	1325	2.66	44.90	60	64
<i>Levinsenia gracilis</i>	Ann	Poly	1163	2.33	47.23	65	69
<i>Cossura</i> (LPIL)	Ann	Poly	1126	2.26	49.49	49	52
Tubificidae (LPIL)	Ann	Olig	1033	2.07	51.56	54	57
<i>Aphelochaeta monilaris</i>	Ann	Poly	1023	2.05	53.61	45	48
Bivalvia (LPIL)	Mol	Biva	822	1.65	55.26	56	60
Ophiuroidea (LPIL)	Ech	Ophi	821	1.65	56.90	50	53
<i>Photis</i> (LPIL)	Art	Mala	799	1.60	58.51	38	40
<i>Nutricola tantilla</i>	Mol	Biva	663	1.33	59.83	38	40
<i>Rhepoxynius daboius</i>	Art	Mala	604	1.21	61.05	27	29
<i>Prionospio</i> (LPIL)	Ann	Poly	588	1.18	62.22	57	61
<i>Ennucula tenuis</i>	Mol	Biva	568	1.14	63.36	44	47
<i>Prionospio lighti</i>	Ann	Poly	568	1.14	64.50	61	65
<i>Mediomastus</i> (LPIL)	Ann	Poly	502	1.01	65.51	66	70
<i>Metaphoxus frequens</i>	Art	Mala	486	0.97	66.48	33	35
<i>Magelona berkleyi</i>	Ann	Poly	467	0.94	67.42	23	24
<i>Armandia brevis</i>	Ann	Poly	456	0.91	68.33	35	37
Lumbrineridae (LPIL)	Ann	Poly	436	0.87	69.20	58	62
<i>Ehlersia hyperioni</i>	Ann	Poly	349	0.70	69.90	25	27
Lysianassidae Genus G	Art	Mala	343	0.69	70.59	13	14
<i>Protomedeia articulata</i>	Art	Mala	338	0.68	71.27	21	22
Gastropoda (LPIL)	Mol	Gast	315	0.63	71.90	34	36
<i>Tellina</i> (LPIL)	Mol	Biva	307	0.62	72.52	12	13
<i>Cherimedeia zotea</i>	Art	Mala	299	0.60	73.12	21	22
<i>Munnogonium tillerae</i>	Art	Mala	299	0.60	73.71	15	16
<i>Harmothoe imbricata</i>	Ann	Poly	251	0.50	74.22	33	35
Mytilidae (LPIL)	Mol	Biva	248	0.50	74.71	13	14
<i>Nephtys caecoides</i>	Ann	Poly	243	0.49	75.20	37	39
Lucinidae (LPIL)	Mol	Biva	239	0.48	75.68	37	39
<i>Harpiniopsis fulgens</i>	Art	Mala	232	0.47	76.15	16	17
<i>Americhelidium shoemakeri</i>	Art	Mala	230	0.46	76.61	40	43
<i>Cumella morion</i>	Art	Mala	213	0.43	77.03	16	17
<i>Sphaerodoropsis sexantennella</i>	Ann	Poly	208	0.42	77.45	30	32
<i>Leitoscoloplos pugettensis</i>	Ann	Poly	202	0.40	77.86	34	36
<i>Leucon nasica</i>	Art	Mala	201	0.40	78.26	22	23
Amphiuridae (LPIL)	Ech	Ophi	196	0.39	78.65	6	6
Columbellidae (LPIL)	Mol	Gast	192	0.38	79.04	34	36
<i>Munna ubiquita</i>	Art	Mala	186	0.37	79.41	12	13
<i>Prionospio steenstrupi</i>	Ann	Poly	176	0.35	79.76	40	43
<i>Scoletoma tetraura</i>	Ann	Poly	172	0.34	80.11	25	27
<i>Glycinde armigera</i>	Ann	Poly	171	0.34	80.45	34	36
<i>Erichthonius rubricornis</i>	Art	Mala	169	0.34	80.79	5	5
<i>Nephtys ferruginea</i>	Ann	Poly	167	0.33	81.12	35	37
Rhynchocoela (LPIL)	Rhy	-	158	0.32	81.44	56	60
<i>Aricidea</i> (LPIL)	Ann	Poly	156	0.31	81.75	27	29
<i>Microjassa</i> sp. A	Art	Mala	153	0.31	82.06	14	15
<i>Lumbrineris cruzensis</i>	Ann	Poly	149	0.30	82.36	23	24
<i>Scoloura phillipsi</i>	Art	Mala	148	0.30	82.65	22	23
<i>Apistobranchus ornatus</i>	Ann	Poly	140	0.28	82.93	10	11
<i>Photis bifurcatus</i>	Art	Mala	140	0.28	83.22	6	6
Enchytraeidae (LPIL)	Ann	Olig	127	0.25	83.47	11	12

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Gattyana treadwelli</i>	Ann	Poly	126	0.25	83.72	25	27
<i>Leptidepecreum</i> sp. A	Art	Mala	123	0.25	83.97	17	18
<i>Lucina</i> (LPIL)	Mol	Biva	121	0.24	84.21	20	21
<i>Guerneia reduncans</i>	Art	Mala	119	0.24	84.45	13	14
<i>Scoloplos acmeiceps</i>	Ann	Poly	113	0.23	84.68	9	10
<i>Pleusymptes subglaber</i>	Art	Mala	110	0.22	84.90	15	16
<i>Exogone lourei</i>	Ann	Poly	108	0.22	85.11	21	22
<i>Pleurogonium rubicundum</i>	Art	Mala	105	0.21	85.32	30	32
<i>Semete</i> (LPIL)	Mol	Biva	102	0.20	85.53	5	5
<i>Tritella laevis</i>	Art	Mala	102	0.20	85.73	12	13
<i>Spiophanes bombyx</i>	Ann	Poly	98	0.20	85.93	9	10
<i>Chaetozone setosa</i>	Ann	Poly	97	0.19	86.12	6	6
<i>Eudorella truncatula</i>	Art	Mala	94	0.19	86.31	3	3
Spionidae (LPIL)	Ann	Poly	90	0.18	86.49	37	39
Maldanidae (LPIL)	Ann	Poly	88	0.18	86.67	26	28
<i>Exogone molesta</i>	Ann	Poly	87	0.17	86.84	20	21
<i>Harpinopsis galera</i>	Art	Mala	86	0.17	87.02	9	10
<i>Nephtys</i> (LPIL)	Ann	Poly	86	0.17	87.19	10	11
<i>Aoroides</i> (LPIL)	Art	Mala	85	0.17	87.36	13	14
<i>Glycera</i> (LPIL)	Ann	Poly	85	0.17	87.53	23	24
<i>Odostomia</i> (LPIL)	Mol	Gast	85	0.17	87.70	22	23
Turbellaria (LPIL)	Pla	Turb	81	0.16	87.86	34	36
<i>Aricidea catherinae</i>	Ann	Poly	79	0.16	88.02	18	19
<i>Dipolydora socialis</i>	Ann	Poly	79	0.16	88.18	37	39
<i>Heteropodarke heteromorpha</i>	Ann	Poly	78	0.16	88.33	4	4
<i>Dipolydora caulleryi</i>	Ann	Poly	77	0.15	88.49	21	22
<i>Photis californica</i>	Art	Mala	77	0.15	88.64	13	14
<i>Westwoodilla caecula</i>	Art	Mala	77	0.15	88.80	15	16
<i>Cossura rostrata</i>	Ann	Poly	76	0.15	88.95	9	10
<i>Sphaerosyllis ranunculus</i>	Ann	Poly	76	0.15	89.10	14	15
Capitellidae (LPIL)	Ann	Poly	74	0.15	89.25	23	24
<i>Euclymene zonalis</i>	Ann	Poly	74	0.15	89.40	11	12
Nephtyidae (LPIL)	Ann	Poly	74	0.15	89.55	25	27
<i>Axinopsida rubropicta</i>	Mol	Biva	71	0.14	89.69	1	1
<i>Trochochaeta multisetosa</i>	Ann	Poly	71	0.14	89.83	22	23
Solenidae (LPIL)	Mol	Biva	70	0.14	89.97	7	7
<i>Mediomastus californiensis</i>	Ann	Poly	69	0.14	90.11	15	16
<i>Caulleriella pacifica</i>	Ann	Poly	66	0.13	90.24	9	10
<i>Diastylis pellucida</i>	Art	Mala	66	0.13	90.38	24	26
Yoldiidae (LPIL)	Mol	Biva	66	0.13	90.51	4	4
Paraonidae (LPIL)	Ann	Poly	65	0.13	90.64	16	17
<i>Podarkeopsis glabra</i>	Ann	Poly	64	0.13	90.77	13	14
<i>Capitella capitata</i>	Ann	Poly	63	0.13	90.89	5	5
<i>Lumbrineris</i> (LPIL)	Ann	Poly	63	0.13	91.02	18	19
<i>Glycera nana</i>	Ann	Poly	62	0.12	91.14	28	30
<i>Aoroides intermedium</i>	Art	Mala	61	0.12	91.26	8	9
<i>Dyopedos</i> sp. A	Art	Mala	60	0.12	91.39	4	4
<i>Mayerella banksia</i>	Art	Mala	60	0.12	91.51	11	12
<i>Prionospio jubata</i>	Ann	Poly	60	0.12	91.63	15	16
<i>Protodorvillea gracilis</i>	Ann	Poly	60	0.12	91.75	8	9
<i>Lyonsia californica</i>	Mol	Biva	58	0.12	91.86	17	18
Terebellidae (LPIL)	Ann	Poly	58	0.12	91.98	24	26
<i>Aoroides inermis</i>	Art	Mala	57	0.11	92.09	8	9
Holothuroidea (LPIL)	Ech	Holo	56	0.11	92.21	10	11
<i>Micropodarke dubia</i>	Ann	Poly	56	0.11	92.32	16	17
<i>Glycinde picta</i>	Ann	Poly	55	0.11	92.43	19	20
<i>Lumbrineris japonica</i>	Ann	Poly	54	0.11	92.54	15	16
<i>Deflexilodes similis</i>	Art	Mala	53	0.11	92.64	7	7
<i>Gammaropsis shoemakeri</i>	Art	Mala	52	0.10	92.75	6	6
Oedicerotidae (LPIL)	Art	Mala	52	0.10	92.85	17	18

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Podarke pugettensis</i>	Ann	Poly	51	0.10	92.95	22	23
<i>Rhepoxynius bicuspidatus</i>	Art	Mala	51	0.10	93.05	2	2
<i>Americhelidium rectipalmum</i>	Art	Mala	50	0.10	93.16	14	15
<i>Sigambra setosa</i>	Ann	Poly	50	0.10	93.26	18	19
<i>Tenonia priops</i>	Ann	Poly	49	0.10	93.35	29	31
Sipuncula (LPIL)	Sip	–	48	0.10	93.45	13	14
Actiniaria (LPIL)	Cni	Anth	47	0.09	93.54	16	17
<i>Corophium brevis</i>	Art	Mala	47	0.09	93.64	8	9
<i>Eteone leptotes</i>	Ann	Poly	47	0.09	93.73	23	24
<i>Dyopedos monacanthus</i>	Art	Mala	46	0.09	93.82	20	21
<i>Metopa cystella</i>	Art	Mala	46	0.09	93.92	13	14
Semelidae (LPIL)	Mol	Biva	46	0.09	94.01	5	5
<i>Clinocardium ciliatum</i>	Mol	Biva	45	0.09	94.10	3	3
<i>Phyllodoce groenlandica</i>	Ann	Poly	45	0.09	94.19	24	26
Syllidae (LPIL)	Ann	Poly	45	0.09	94.28	16	17
Ampharetidae (LPIL)	Ann	Poly	44	0.09	94.37	20	21
<i>Ophelina acuminata</i>	Ann	Poly	43	0.09	94.45	16	17
<i>Turbonitla</i> (LPIL)	Mol	Gast	41	0.08	94.54	18	19
<i>Miodontiscus prolongatus</i>	Mol	Biva	39	0.08	94.61	1	1
<i>Heterophoxus oculatus</i>	Art	Mala	37	0.07	94.69	6	6
<i>Platynereis bicanaliculata</i>	Ann	Poly	37	0.07	94.76	11	12
<i>Sphaerosyllis</i> (LPIL)	Ann	Poly	37	0.07	94.84	6	6
<i>Ampelisca careyi</i>	Art	Mala	36	0.07	94.91	6	6
<i>Podarkeopsis perkinsi</i>	Ann	Poly	36	0.07	94.98	20	21
Tellinidae (LPIL)	Mol	Biva	36	0.07	95.05	12	13
<i>Euchone incolor</i>	Ann	Poly	35	0.07	95.12	4	4
Hesionidae (LPIL)	Ann	Poly	35	0.07	95.19	17	18
<i>Magelona longicornis</i>	Ann	Poly	34	0.07	95.26	16	17
<i>Pholoides aspera</i>	Ann	Poly	34	0.07	95.33	9	10
<i>Aricidea ramosa</i>	Ann	Poly	33	0.07	95.40	9	10
<i>Byblis veleronis</i>	Art	Mala	33	0.07	95.46	8	9
<i>Lyonsia arenosa</i>	Mol	Biva	33	0.07	95.53	5	5
<i>Melita dentata</i>	Art	Mala	33	0.07	95.59	13	14
<i>Ampharete acutifrons</i>	Ann	Poly	32	0.06	95.66	12	13
Asciacea (LPIL)	Cho	Asci	30	0.06	95.72	3	3
<i>Ctinocardium</i> (LPIL)	Mol	Biva	29	0.06	95.78	6	6
<i>Eudorellopsis longirostris</i>	Art	Mala	29	0.06	95.83	11	12
<i>Glycera americana</i>	Ann	Poly	28	0.06	95.89	13	14
<i>Desmosoma</i> sp. B	Art	Mala	27	0.05	95.95	3	3
<i>Carazziella hobsonae</i>	Ann	Poly	26	0.05	96.00	6	6
<i>Orchomene</i> sp. F	Art	Mala	26	0.05	96.05	2	2
<i>Eumida longicornuta</i>	Ann	Poly	24	0.05	96.10	12	13
<i>Malmgreniella macginitiei</i>	Ann	Poly	24	0.05	96.15	9	10
<i>Ischyrocerus anguipes</i>	Art	Mala	23	0.05	96.19	6	6
<i>Chaetozone</i> (LPIL)	Ann	Poly	22	0.04	96.24	15	16
Dorvilleidae (LPIL)	Ann	Poly	22	0.04	96.28	12	13
Lineidae (LPIL)	Rhy	Anop	22	0.04	96.32	14	15
<i>Phyllodoce longipes</i>	Ann	Poly	22	0.04	96.37	10	11
Polynoidae (LPIL)	Ann	Poly	22	0.04	96.41	18	19
<i>Eochelidium</i> sp. A	Art	Mala	21	0.04	96.45	3	3
<i>Eteone californica</i>	Ann	Poly	21	0.04	96.50	10	11
<i>Lumbrineris latreilli</i>	Ann	Poly	21	0.04	96.54	10	11
Myidae (LPIL)	Mol	Biva	21	0.04	96.58	8	9
<i>Cumella californica</i>	Art	Mala	20	0.04	96.62	5	5
<i>Gasteropteron pacificum</i>	Mol	Gast	20	0.04	96.66	10	11
Isaeidae (LPIL)	Art	Mala	20	0.04	96.70	7	7
<i>Monticellina</i> (LPIL)	Ann	Poly	20	0.04	96.74	3	3
<i>Ptonosyllis</i> sp. F	Ann	Poly	20	0.04	96.78	1	1
<i>Boccardiella hamata</i>	Ann	Poly	19	0.04	96.82	4	4
Cardiidae (LPIL)	Mol	Biva	19	0.04	96.86	9	10

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Gammaropsis</i> (LPIL)	Art	Mala	19	0.04	96.90	3	3
<i>Leitoscoloptos</i> (LPIL)	Ann	Poly	19	0.04	96.93	11	12
<i>Munna</i> sp. A	Art	Mala	19	0.04	96.97	5	5
<i>Ampelisca</i> (LPIL)	Art	Mala	18	0.04	97.01	5	5
<i>Exogone</i> (LPIL)	Ann	Poly	18	0.04	97.04	6	6
<i>Hiatella arctica</i>	Mol	Biva	18	0.04	97.08	4	4
<i>Lirularia lirulata</i>	Mol	Gast	18	0.04	97.12	2	2
<i>Photis parvidons</i>	Art	Mala	18	0.04	97.15	3	3
<i>Polycirrus</i> (LPIL)	Ann	Poly	18	0.04	97.19	6	6
<i>Tubutanus</i> (LPIL)	Rhy	Anop	18	0.04	97.22	10	11
<i>Brada villosa</i>	Ann	Poly	17	0.03	97.26	10	11
<i>Nereis pelagica</i>	Ann	Poly	17	0.03	97.29	11	12
<i>Spiophanes</i> (LPIL)	Ann	Poly	17	0.03	97.33	8	9
<i>Spiophanes berkeleyorum</i>	Ann	Poly	17	0.03	97.36	12	13
<i>Lumbrineris californica</i>	Ann	Poly	16	0.03	97.39	7	7
<i>Pandora</i> (LPIL)	Mol	Biva	16	0.03	97.42	5	5
Phyllodoceidae (LPIL)	Ann	Poly	16	0.03	97.46	11	12
<i>Ceratonereis tunicatae</i>	Ann	Poly	15	0.03	97.49	6	6
<i>Cumella</i> sp. 1	Art	Mala	15	0.03	97.52	6	6
Glyceridae (LPIL)	Ann	Poly	15	0.03	97.55	8	9
<i>Paraprionospio pinnata</i>	Ann	Poly	15	0.03	97.58	12	13
<i>Pilargis maculata</i>	Ann	Poly	15	0.03	97.61	9	10
<i>Spiochaetopterus costarum</i>	Ann	Poly	15	0.03	97.64	9	10
<i>Terebellides californica</i>	Ann	Poly	15	0.03	97.67	12	13
Cossuridae (LPIL)	Ann	Poly	14	0.03	97.69	4	4
<i>Crenella decussata</i>	Mol	Biva	14	0.03	97.72	7	7
<i>Haliophasma geminata</i>	Art	Mala	14	0.03	97.75	7	7
<i>Heteromastus filiformis</i>	Ann	Poly	14	0.03	97.78	7	7
<i>Leptochelia</i> (LPIL)	Art	Mala	14	0.03	97.81	11	12
<i>Phyllodoce hartmanae</i>	Ann	Poly	14	0.03	97.84	9	10
<i>Argissa hamatipes</i>	Art	Mala	13	0.03	97.86	5	5
<i>Cossura pygodactylata</i>	Ann	Poly	13	0.03	97.89	4	4
<i>Flabelligera affinis</i>	Ann	Poly	13	0.03	97.91	2	2
Phoxocephalidae (LPIL)	Art	Mala	13	0.03	97.94	8	9
Ampeliscidae (LPIL)	Art	Mala	12	0.02	97.96	8	9
<i>Barantolla americana</i>	Ann	Poly	12	0.02	97.99	7	7
<i>Phyllodoce</i> (LPIL)	Ann	Poly	12	0.02	98.01	10	11
Rissoidae (LPIL)	Mol	Gast	12	0.02	98.04	2	2
<i>Aricidea wassi</i>	Ann	Poly	11	0.02	98.06	3	3
<i>Ehlersia heterochaeta</i>	Ann	Poly	11	0.02	98.08	6	6
<i>Magelona</i> (LPIL)	Ann	Poly	11	0.02	98.10	8	9
Onuphidae (LPIL)	Ann	Poly	11	0.02	98.12	8	9
<i>Scaphopoda</i> (LPIL)	Mol	Scap	11	0.02	98.15	3	3
<i>Yoldia</i> (LPIL)	Mol	Biva	11	0.02	98.17	8	9
<i>Aricidea lopezi</i>	Ann	Poly	10	0.02	98.19	2	2
<i>Cumella vulgaris</i>	Art	Mala	10	0.02	98.21	1	1
<i>Dipolydora</i> (LPIL)	Ann	Poly	10	0.02	98.23	8	9
<i>Gammaropsis thompsoni</i>	Art	Mala	10	0.02	98.25	2	2
Lysianassidae (LPIL)	Art	Mala	10	0.02	98.27	8	9
<i>Nebalia pugettensis</i>	Art	Mala	10	0.02	98.29	6	6
<i>Ophelia breviata</i>	Ann	Poly	10	0.02	98.31	1	1
<i>Sthenelais verruculosa</i>	Ann	Poly	10	0.02	98.33	4	4
Aeginellidae (LPIL)	Art	Mala	9	0.02	98.35	5	5
<i>Barantolla</i> sp. C	Ann	Poly	9	0.02	98.36	1	1
<i>Cardomya</i> (LPIL)	Mol	Biva	9	0.02	98.38	3	3
<i>Corophium</i> (LPIL)	Art	Mala	9	0.02	98.40	3	3
<i>Hemipodus borealis</i>	Ann	Poly	9	0.02	98.42	5	5
<i>Monocutodes</i> (LPIL)	Art	Mala	9	0.02	98.44	5	5
<i>Mytilus edulis</i>	Mol	Biva	9	0.02	98.45	6	6
<i>Paleanotus bellis</i>	Ann	Poly	9	0.02	98.47	6	6

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Parougia caeca</i>	Ann	Poly	9	0.02	98.49	5	5
<i>Pectinaria californiensis</i>	Ann	Poly	9	0.02	98.51	7	7
<i>Tiron biocellata</i>	Art	Mala	9	0.02	98.53	4	4
<i>Byblis</i> (LPIL)	Art	Mala	8	0.02	98.54	4	4
<i>Campylaspis rubromaculata</i>	Art	Mala	8	0.02	98.56	5	5
<i>Glycera tessellata</i>	Ann	Poly	8	0.02	98.57	7	7
<i>Pleurobranchaea californica</i>	Mol	Gast	8	0.02	98.59	1	1
Sabellidae (LPIL)	Ann	Poly	8	0.02	98.61	6	6
<i>Terebellides</i> (LPIL)	Ann	Poly	8	0.02	98.62	5	5
<i>Iryphosella</i> sp. A	Art	Mala	8	0.02	98.64	2	2
<i>Americhetidium</i> (LPIL)	Art	Mala	7	0.01	98.65	5	5
Asteroidea (LPIL)	Ech	Aste	7	0.01	98.67	2	2
Calyptraeidae (LPIL)	Mol	Gast	7	0.01	98.68	3	3
<i>Eupolytnia heterobranchia</i>	Ann	Poly	7	0.01	98.70	3	3
<i>Hippomedon</i> (LPIL)	Art	Mala	7	0.01	98.71	2	2
Naticidae (LPIL)	Mol	Gast	7	0.01	98.72	1	1
<i>Onuphis elegans</i>	Ann	Poly	7	0.01	98.74	5	5
<i>Paraphoxus</i> (LPIL)	Art	Mala	7	0.01	98.75	1	1
<i>Pectinaria</i> (LPIL)	Ann	Poly	7	0.01	98.77	7	7
<i>Pontogeneia inermis</i>	Art	Mala	7	0.01	98.78	2	2
Scaphandridae (LPIL)	Mol	Gast	7	0.01	98.79	4	4
<i>Terebellides horikoshii</i>	Ann	Poly	7	0.01	98.81	2	2
<i>Ampelisca lobata</i>	Art	Mala	6	0.01	98.82	1	1
<i>Ampelisca pugetica</i>	Art	Mala	6	0.01	98.83	5	5
Anarthruridae (LPIL)	Art	Mala	6	0.01	98.84	1	1
<i>Bathymedon pumilus</i>	Art	Mala	6	0.01	98.86	5	5
<i>Ennucula</i> (LPIL)	Mol	Biva	6	0.01	98.87	1	1
<i>Eteone longa</i>	Ann	Poly	6	0.01	98.88	2	2
<i>Lacuna variegata</i>	Mol	Gast	6	0.01	98.89	1	1
<i>Pardalisca cuspidata</i>	Art	Mala	6	0.01	98.90	3	3
Pleustidae (LPIL)	Art	Mala	6	0.01	98.92	1	1
<i>Polygordius</i> (LPIL)	Ann	Poly	6	0.01	98.93	2	2
<i>Spiophanes duplex</i>	Ann	Poly	6	0.01	98.94	3	3
<i>Spiophanes kroeyeri</i>	Ann	Poly	6	0.01	98.95	4	4
<i>Terebellides stroemi</i>	Ann	Poly	6	0.01	98.96	4	4
Amphipoda (LPIL)	Art	Mala	5	0.01	98.97	3	3
<i>Aphelochaeta</i> (LPIL)	Ann	Poly	5	0.01	98.98	2	2
<i>Astarte compacta</i>	Mol	Biva	5	0.01	98.99	1	1
<i>Campylaspis biplicata</i>	Art	Mala	5	0.01	99.00	4	4
Caprellidae (LPIL)	Art	Mala	5	0.01	99.01	3	3
Cerithiidae (LPIL)	Mol	Gast	5	0.01	99.02	1	1
Chaetopteridae (LPIL)	Ann	Poly	5	0.01	99.03	4	4
<i>Chaetozone lumula</i>	Ann	Poly	5	0.01	99.04	4	4
<i>Eteone</i> (LPIL)	Ann	Poly	5	0.01	99.05	4	4
<i>Euchone limnicola</i>	Ann	Poly	5	0.01	99.06	2	2
<i>Eusirus longipes</i>	Art	Mala	5	0.01	99.07	4	4
<i>Laonice pugettensis</i>	Ann	Poly	5	0.01	99.08	4	4
<i>Okenia vancouverensis</i>	Mol	Gast	5	0.01	99.09	5	5
<i>Opisa eschrichtii</i>	Art	Mala	5	0.01	99.10	5	5
<i>Pachynus</i> cf. <i>barnardi</i>	Art	Mala	5	0.01	99.11	4	4
Pandoridae (LPIL)	Mol	Biva	5	0.01	99.12	4	4
<i>Phoronis</i> (LPIL)	Pho	-	5	0.01	99.13	4	4
<i>Polydora cornuta</i>	Ann	Poly	5	0.01	99.14	2	2
<i>Scoloplos armiger</i>	Ann	Poly	5	0.01	99.15	2	2
<i>Sphaerosyllis brandhorsti</i>	Ann	Poly	5	0.01	99.16	3	3
<i>Spio cirrifera</i>	Ann	Poly	5	0.01	99.17	2	2
Stenothoidae (LPIL)	Art	Mala	5	0.01	99.18	2	2
<i>Ampharete labrops</i>	Ann	Poly	4	0.01	99.19	3	3
Amphilochidae (LPIL)	Art	Mala	4	0.01	99.20	4	4
<i>Anonyx liljeborgii</i>	Art	Mala	4	0.01	99.21	2	2

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Aoroides columbiana</i>	Art	Mala	4	0.01	99.22	1	1
<i>Caulleriella hamata</i>	Ann	Poly	4	0.01	99.22	1	1
<i>Chaetozone</i> sp. L	Ann	Poly	4	0.01	99.23	1	1
<i>Dipolydora cardalia</i>	Ann	Poly	4	0.01	99.24	3	3
<i>Dorvillea annulata</i>	Ann	Poly	4	0.01	99.25	3	3
<i>Eteone pigmentata</i>	Ann	Poly	4	0.01	99.26	3	3
<i>Eumida tubiformis</i>	Ann	Poly	4	0.01	99.26	3	3
<i>Harmothoe fragilis</i>	Ann	Poly	4	0.01	99.27	2	2
<i>Hemilamprops californicus</i>	Art	Mala	4	0.01	99.28	3	3
Hirudinea (LPIL)	Ann	Hiru	4	0.01	99.29	3	3
<i>Homalopoma lacunatum</i>	Mol	Gast	4	0.01	99.30	1	1
<i>Lamprops</i> sp. A	Art	Mala	4	0.01	99.30	1	1
<i>Lyonsia</i> (LPIL)	Mol	Biva	4	0.01	99.31	2	2
Lyonsiidae (LPIL)	Mol	Biva	4	0.01	99.32	2	2
Magelonidae (LPIL)	Ann	Poly	4	0.01	99.33	4	4
Nereidae (LPIL)	Ann	Poly	4	0.01	99.34	4	4
<i>Nereis</i> (LPIL)	Ann	Poly	4	0.01	99.34	3	3
<i>Nereis procera</i>	Ann	Poly	4	0.01	99.35	3	3
<i>Odontosyllis phosphorea</i>	Ann	Poly	4	0.01	99.36	3	3
<i>Owenia fusiformis</i>	Ann	Poly	4	0.01	99.37	3	3
<i>Phyllodoce pettiboneae</i>	Ann	Poly	4	0.01	99.38	3	3
<i>Pleurogonium</i> (LPIL)	Art	Mala	4	0.01	99.38	2	2
<i>Polycirrus californicus</i>	Ann	Poly	4	0.01	99.39	3	3
<i>Proceraea cornuta</i>	Ann	Poly	4	0.01	99.40	2	2
<i>Rhepoxynius abronius</i>	Art	Mala	4	0.01	99.41	3	3
<i>Sthenelais tertiaglabra</i>	Ann	Poly	4	0.01	99.42	2	2
<i>Terebellides</i> sp. A	Ann	Poly	4	0.01	99.42	1	1
Trochidae (LPIL)	Mol	Gast	4	0.01	99.43	3	3
Aphroditidae (LPIL)	Ann	Poly	3	0.01	99.44	3	3
<i>Barantolla</i> (LPIL)	Ann	Poly	3	0.01	99.44	1	1
<i>Campylaspis blakei</i>	Art	Mala	3	0.01	99.45	2	2
<i>Caprella</i> (LPIL)	Art	Mala	3	0.01	99.46	2	2
<i>Chaetozone hartmanae</i>	Ann	Poly	3	0.01	99.46	2	2
<i>Chrysopetalum occidentale</i>	Ann	Poly	3	0.01	99.47	3	3
Cnidaria (LPIL)	Cni	-	3	0.01	99.47	2	2
Cumacea (LPIL)	Art	Mala	3	0.01	99.48	2	2
<i>Cumella</i> (LPIL)	Art	Mala	3	0.01	99.49	3	3
<i>Cumella</i> sp. S	Art	Mala	3	0.01	99.49	1	1
<i>Decamastus gracilis</i>	Ann	Poly	3	0.01	99.50	2	2
Decapoda (LPIL)	Art	Mala	3	0.01	99.50	1	1
<i>Dyopetos</i> (LPIL)	Art	Mala	3	0.01	99.51	1	1
<i>Eteone pacifica</i>	Ann	Poly	3	0.01	99.52	3	3
<i>Euchone hancocki</i>	Ann	Poly	3	0.01	99.52	1	1
Flabelligeridae (LPIL)	Ann	Poly	3	0.01	99.53	2	2
Gammaridae (LPIL)	Art	Mala	3	0.01	99.53	2	2
<i>Hippomedon denticulatus</i>	Art	Mala	3	0.01	99.54	2	2
<i>Laonice cirrata</i>	Ann	Poly	3	0.01	99.55	2	2
<i>Lepidasthenia berkeleyae</i>	Ann	Poly	3	0.01	99.55	2	2
<i>Leptochelia savignyi</i>	Art	Mala	3	0.01	99.56	2	2
<i>Mediomastus ambiseta</i>	Ann	Poly	3	0.01	99.57	3	3
<i>Megalomma splendida</i>	Ann	Poly	3	0.01	99.57	1	1
Melitidae (LPIL)	Art	Mala	3	0.01	99.58	3	3
<i>Notomastus</i> (LPIL)	Ann	Poly	3	0.01	99.58	1	1
Opheliidae (LPIL)	Ann	Poly	3	0.01	99.59	3	3
<i>Parougia batuca</i>	Ann	Poly	3	0.01	99.60	3	3
Pholoidae (LPIL)	Ann	Poly	3	0.01	99.60	2	2
<i>Rhynchospio glutaea</i>	Ann	Poly	3	0.01	99.61	3	3
Tanaidacea (LPIL)	Art	Mala	3	0.01	99.61	2	2
<i>Travisia brevis</i>	Ann	Poly	3	0.01	99.62	1	1
<i>Typosyllis aciculata</i>	Ann	Poly	3	0.01	99.63	3	3

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Typosyllis hyalina</i>	Ann	Poly	3	0.01	99.63	3	3
Veneridae (LPIL)	Mol	Biva	3	0.01	99.64	2	2
<i>Verticordia</i> (LPIL)	Mol	Biva	3	0.01	99.64	1	1
Aoridae (LPIL)	Art	Mala	2	0.00	99.65	2	2
<i>Bathymedon</i> (LPIL)	Art	Mala	2	0.00	99.65	1	1
<i>Capitella</i> (LPIL)	Ann	Poly	2	0.00	99.66	1	1
<i>Cautlerella</i> (LPIL)	Ann	Poly	2	0.00	99.66	2	2
<i>Chone duneri</i>	Ann	Poly	2	0.00	99.66	2	2
<i>Cirrophorus</i> (LPIL)	Ann	Poly	2	0.00	99.67	1	1
Corbulidae (LPIL)	Mol	Biva	2	0.00	99.67	1	1
<i>Diastylis sentosa</i>	Art	Mala	2	0.00	99.68	2	2
<i>Euchone analis</i>	Ann	Poly	2	0.00	99.68	1	1
<i>Eudorella</i> (LPIL)	Art	Mala	2	0.00	99.68	1	1
<i>Eudorellopsis</i> (LPIL)	Art	Mala	2	0.00	99.69	1	1
<i>Gammaropsis intermedius</i>	Art	Mala	2	0.00	99.69	1	1
Goniadidae (LPIL)	Ann	Poly	2	0.00	99.70	2	2
<i>Grandidierella japonica</i>	Art	Mala	2	0.00	99.70	1	1
Ischyroceridae (LPIL)	Art	Mala	2	0.00	99.70	2	2
<i>Laonice</i> (LPIL)	Ann	Poly	2	0.00	99.71	2	2
Lasaeidae (LPIL)	Mol	Biva	2	0.00	99.71	1	1
<i>Lepidepcreum gurjanovae</i>	Art	Mala	2	0.00	99.72	1	1
<i>Leptostytus</i> sp. B	Art	Mala	2	0.00	99.72	2	2
<i>Melita</i> (LPIL)	Art	Mala	2	0.00	99.72	2	2
<i>Micronereis nanaimoensis</i>	Ann	Poly	2	0.00	99.73	2	2
<i>Microphthalmus</i> (LPIL)	Ann	Poly	2	0.00	99.73	2	2
<i>Munna fernaldi</i>	Art	Mala	2	0.00	99.74	1	1
Mysidae (LPIL)	Art	Mala	2	0.00	99.74	2	2
<i>Naineris</i> (LPIL)	Ann	Poly	2	0.00	99.74	1	1
<i>Naineris cf. grubei</i>	Ann	Poly	2	0.00	99.75	1	1
<i>Nephtys signifera</i>	Ann	Poly	2	0.00	99.75	2	2
<i>Nuculana</i> (LPIL)	Mol	Biva	2	0.00	99.76	1	1
<i>Nuculana minuta</i>	Mol	Biva	2	0.00	99.76	1	1
<i>Odostomia kennerleyi</i>	Mol	Gast	2	0.00	99.76	1	1
<i>Odostomia quadrae</i>	Mol	Gast	2	0.00	99.77	1	1
<i>Onuphis</i> (LPIL)	Ann	Poly	2	0.00	99.77	2	2
<i>Onuphis affinis</i>	Ann	Poly	2	0.00	99.78	2	2
<i>Onuphis</i> sp. K	Ann	Poly	2	0.00	99.78	2	2
<i>Parapleustes pugettensis</i>	Art	Mala	2	0.00	99.78	2	2
<i>Pettiboneia sanmatiensis</i>	Ann	Poly	2	0.00	99.79	2	2
<i>Pseudopolydora kemp</i>	Ann	Poly	2	0.00	99.79	1	1
<i>Rhynohalicella halona</i>	Art	Mala	2	0.00	99.80	1	1
<i>Schistomeringos rudolphi</i>	Ann	Poly	2	0.00	99.80	2	2
<i>Scotoptos</i> (LPIL)	Ann	Poly	2	0.00	99.80	2	2
<i>Sphaerosyllis californiensis</i>	Ann	Poly	2	0.00	99.81	2	2
<i>Streptosyllis latipalpa</i>	Ann	Poly	2	0.00	99.81	2	2
<i>Travisia</i> (LPIL)	Ann	Poly	2	0.00	99.82	1	1
<i>Tritella</i> (LPIL)	Art	Mala	2	0.00	99.82	1	1
<i>Zeuxo maledivensis</i>	Art	Mala	2	0.00	99.82	1	1
<i>Acteocma</i> (LPIL)	Mol	Gast	1	0.00	99.83	1	1
Acteonidae (LPIL)	Mol	Gast	1	0.00	99.83	1	1
<i>Americamysis</i> (LPIL)	Art	Mala	1	0.00	99.83	1	1
<i>Ampelisca cristata</i>	Art	Mala	1	0.00	99.83	1	1
<i>Ampelisca hancocki</i>	Art	Mala	1	0.00	99.83	1	1
Aplacophora (LPIL)	Mol	Apla	1	0.00	99.84	1	1
<i>Arcteobea anticostiensis</i>	Ann	Poly	1	0.00	99.84	1	1
Arcturidae (LPIL)	Art	Mala	1	0.00	99.84	1	1
<i>Aricidea minuta</i>	Ann	Poly	1	0.00	99.84	1	1
<i>Aricidea</i> sp. N	Ann	Poly	1	0.00	99.84	1	1
<i>Astarte</i> (LPIL)	Mol	Biva	1	0.00	99.85	1	1
<i>Autolytus</i> (LPIL)	Ann	Poly	1	0.00	99.85	1	1

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
<i>Campylaspis canaliculata</i>	Art	Mala	1	0.00	99.85	1	1
<i>Campylaspis hartae</i>	Art	Mala	1	0.00	99.85	1	1
<i>Cardiomya pectinata</i>	Mol	Biva	1	0.00	99.85	1	1
<i>Caulleriella bioculata</i>	Ann	Poly	1	0.00	99.86	1	1
<i>Chaetozone acuta</i>	Ann	Poly	1	0.00	99.86	1	1
<i>Chaetozone</i> sp. M	Ann	Poly	1	0.00	99.86	1	1
<i>Chone</i> (LPIL)	Ann	Poly	1	0.00	99.86	1	1
<i>Crenella</i> (LPIL)	Mol	Biva	1	0.00	99.86	1	1
<i>Crepidula</i> (LPIL)	Mol	Gast	1	0.00	99.87	1	1
Cuspidariidae (LPIL)	Mol	Biva	1	0.00	99.87	1	1
<i>Cyclocardia</i> (LPIL)	Mol	Biva	1	0.00	99.87	1	1
<i>Cylichna attonsa</i>	Mol	Gast	1	0.00	99.87	1	1
<i>Deutella californica</i>	Art	Mala	1	0.00	99.87	1	1
Diastylidae (LPIL)	Art	Mala	1	0.00	99.88	1	1
<i>Diastylopsis tenuis</i>	Art	Mala	1	0.00	99.88	1	1
<i>Diptodonta</i> (LPIL)	Mol	Biva	1	0.00	99.88	1	1
<i>Dipolydora elegantissima</i>	Ann	Poly	1	0.00	99.88	1	1
<i>Drilonereis longa</i>	Ann	Poly	1	0.00	99.88	1	1
Echinodermata (LPIL)	Ech	-	1	0.00	99.89	1	1
Echinoidea (LPIL)	Ech	Echi	1	0.00	99.89	1	1
<i>Eteone brigittae</i>	Ann	Poly	1	0.00	99.89	1	1
<i>Eteone tuberculata</i>	Ann	Poly	1	0.00	99.89	1	1
<i>Euchone</i> (LPIL)	Ann	Poly	1	0.00	99.89	1	1
Eusiridae (LPIL)	Art	Mala	1	0.00	99.90	1	1
<i>Eusyllis bloomstrandii</i>	Ann	Poly	1	0.00	99.90	1	1
<i>Exogone dwisula</i>	Ann	Poly	1	0.00	99.90	1	1
<i>Exogone gemmifera</i>	Ann	Poly	1	0.00	99.90	1	1
<i>Gitanopsis vilordes</i>	Art	Mala	1	0.00	99.90	1	1
<i>Harmothoe</i> (LPIL)	Ann	Poly	1	0.00	99.91	1	1
<i>Hesperone laevis</i>	Ann	Poly	1	0.00	99.91	1	1
Janiridae (LPIL)	Art	Mala	1	0.00	99.91	1	1
<i>Lepidonotus spiculus</i>	Ann	Poly	1	0.00	99.91	1	1
Leuconidae (LPIL)	Art	Mala	1	0.00	99.91	1	1
<i>Levinsenia</i> (LPIL)	Ann	Poly	1	0.00	99.92	1	1
<i>Melinna</i> (LPIL)	Ann	Poly	1	0.00	99.92	1	1
<i>Melphisana bola</i>	Art	Mala	1	0.00	99.92	1	1
<i>Metopa</i> (LPIL)	Art	Mala	1	0.00	99.92	1	1
<i>Microphthalmus</i> sp. 1	Ann	Poly	1	0.00	99.92	1	1
<i>Monticellina</i> sp. C	Ann	Poly	1	0.00	99.93	1	1
<i>Munna</i> (LPIL)	Art	Mala	1	0.00	99.93	1	1
<i>Nebatia</i> (LPIL)	Art	Mala	1	0.00	99.93	1	1
<i>Neoamphitrite robusta</i>	Ann	Poly	1	0.00	99.93	1	1
<i>Notomastus lineatus</i>	Ann	Poly	1	0.00	99.93	1	1
Nuculanidae (LPIL)	Mol	Biva	1	0.00	99.94	1	1
Oligochaeta (LPIL)	Ann	Olig	1	0.00	99.94	1	1
<i>Ophelia pulchella</i>	Ann	Poly	1	0.00	99.94	1	1
<i>Ophuura</i> sp. C	Ech	Ophi	1	0.00	99.94	1	1
<i>Pacificanthomysis nephrophthalma</i>	Art	Mala	1	0.00	99.94	1	1
<i>Paranaitis polynoides</i>	Ann	Poly	1	0.00	99.95	1	1
<i>Pectinaria granulata</i>	Ann	Poly	1	0.00	99.95	1	1
<i>Phoxocephalus</i> sp. A	Art	Mala	1	0.00	99.95	1	1
<i>Phyllodoce williamsi</i>	Ann	Poly	1	0.00	99.95	1	1
<i>Pista alata</i>	Ann	Poly	1	0.00	99.95	1	1
<i>Pista disjuncta</i>	Ann	Poly	1	0.00	99.96	1	1
<i>Pista elongata</i>	Ann	Poly	1	0.00	99.96	1	1
<i>Pleustes depressa</i>	Art	Mala	1	0.00	99.96	1	1
<i>Pleusymptes</i> sp. D	Art	Mala	1	0.00	99.96	1	1
<i>Podarkeopsis</i> (LPIL)	Ann	Poly	1	0.00	99.96	1	1
Podoceridae (LPIL)	Art	Mala	1	0.00	99.97	1	1
<i>Polycirrus</i> sp. N	Ann	Poly	1	0.00	99.97	1	1

Table 2. Continued:

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Cumulative %	Station Occurrence	Station % Occurrence
Polyplacophora (LPIL)	Mol	Polyp	1	0.00	99.97	1	1
<i>Praxillella praetermissa</i>	Ann	Poly	1	0.00	99.97	1	1
<i>Proclea graffii</i>	Ann	Poly	1	0.00	99.97	1	1
<i>Pseudomma berkleyi</i>	Art	Mala	1	0.00	99.98	1	1
Retusidae (LPIL)	Mol	Gast	1	0.00	99.98	1	1
<i>Rhachotropis oculata</i>	Art	Mala	1	0.00	99.98	1	1
<i>Rhodine bitorquata</i>	Ann	Poly	1	0.00	99.98	1	1
<i>Scalibregma inflatum</i>	Ann	Poly	1	0.00	99.98	1	1
Serpulidae (LPIL)	Ann	Poly	1	0.00	99.99	1	1
<i>Sphaerodorum papillifer</i>	Ann	Poly	1	0.00	99.99	1	1
<i>Spio</i> (LPIL)	Ann	Poly	1	0.00	99.99	1	1
<i>Stenula</i> (LPIL)	Art	Mala	1	0.00	99.99	1	1
<i>Synudotea</i> (LPIL)	Art	Mala	1	0.00	99.99	1	1
Synopiidae (LPIL)	Art	Mala	1	0.00	100.00	1	1
<i>Syrrhoe longifrons</i>	Art	Mala	1	0.00	100.00	1	1
Thyasiridae (LPIL)	Mol	Biva	1	0.00	100.00	1	1

Taxa Key

Ann=Annelida

Hiru=Hirudinea

Poly=Polychaeta

Olig=Oligochaeta

Art=Arthropoda

Mala=Malacostraca

Cho=Chordata

Asci=Asciacea

Cni=Cnidaria

Anth=Anthozoa

Ech=Echinodermata

Aste=Asteroidea

Echi=Echinoidea

Ophi=Ophiroidea

Mol=Mollusca

Apla=Aplacophora

Biva=Bivalvia

Gast=Gastropoda

Polyp=Polyplacophora

Scap=Scaphopoda

Pho=Phoronida

Pla=Platyhelminthes

Turb=Turbellaria

Rhy=Rhynchocoela

Anop=Anopla

Sip=Sipuncula

Table 3. Summary of overall abundance of major benthic macroinfaunal taxonomic groups for the Puget Sound strata, June 1998.

Taxa	Total No. Taxa	% of Total	Total No. Individuals	% of Total
Annelida				
Hirudinea	1	0.2	4	0.0
Oligochaeta	3	0.6	1,161	2.3
Polychaeta	246	49.7	23,283	46.7
Arthropoda				
Malacostraca	154	31.1	11,111	22.3
Echinodermata				
Asteroidea	1	0.2	7	0.0
Echinodermata	1	0.2	1	0.0
Echinoidea	1	0.2	1	0.0
Holothuroidea	1	0.2	56	0.1
Ophiuroidea	3	0.6	1,018	2.0
Mollusca				
Aplacophora	1	0.2	1	0.0
Bivalvia	48	9.7	10,147	20.3
Gastropoda	24	4.8	2,677	5.4
Polyplacophora	1	0.2	1	0.0
Scaphopoda	1	0.2	11	0.0
Other Taxa	9	1.8	412	0.8
Total	495		49,891	

Table 4. Summary of abundance of major benthic macroinfaunal taxonomic groups for the Puget Sound strata, June 1998.

Stratum	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
1	Annelida	44	53.0	566	54.9
	Mollusca	20	24.1	224	21.7
	Arthropoda	16	19.3	209	20.3
	Echinodermata	2	2.4	31	3.0
	Other Taxa	1	1.2	1	0.1
	Total	83		1,031	
2	Annelida	73	47.4	658	29.2
	Mollusca	29	18.8	1,015	45.0
	Arthropoda	49	31.8	543	24.1
	Echinodermata	1	0.6	13	0.6
	Other Taxa	2	1.3	26	1.2
	Total	154		2,255	
4	Annelida	47	42.0	337	22.4
	Mollusca	20	17.9	404	26.8
	Arthropoda	42	37.5	739	49.1
	Echinodermata	1	0.9	15	1.0
	Other Taxa	2	1.8	10	0.7
	Total	112		1,505	
5	Annelida	26	56.5	136	51.9
	Mollusca	7	15.2	12	4.6
	Arthropoda	11	23.9	109	41.6
	Echinodermata	0	0.0	0	0.0
	Other Taxa	2	4.3	5	1.9
	Total	46		262	
6	Annelida	47	47.5	284	12.4
	Mollusca	13	13.1	557	24.3
	Arthropoda	33	33.3	1,425	62.1
	Echinodermata	1	1.0	2	0.1
	Other Taxa	5	5.1	26	1.1
	Total	99		2,294	
7	Annelida	59	55.7	588	32.9
	Mollusca	19	17.9	625	34.9
	Arthropoda	24	22.6	328	18.3
	Echinodermata	1	0.9	224	12.5
	Other Taxa	3	2.8	24	1.3
	Total	106		1,789	

Table 4 . Continued:

Stratum	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
8	Annelida	38	51.4	331	42.2
	Mollusca	9	12.2	245	31.3
	Arthropoda	24	32.4	202	25.8
	Echinodermata	1	1.4	1	0.1
	Other Taxa	2	2.7	5	0.6
	Total	74		784	
9	Annelida	63	62.4	1,080	65.6
	Mollusca	15	14.9	115	7.0
	Arthropoda	20	19.8	444	27.0
	Echinodermata	1	1.0	3	0.2
	Other Taxa	2	2.0	4	0.2
	Total	101		1,646	
10	Annelida	51	52.0	399	18.3
	Mollusca	17	17.3	1,449	66.4
	Arthropoda	25	25.5	271	12.4
	Echinodermata	1	1.0	20	0.9
	Other Taxa	4	4.1	44	2.0
	Total	98		2,183	
11	Annelida	21	41.2	138	20.7
	Mollusca	6	11.8	92	13.8
	Arthropoda	22	43.1	436	65.3
	Echinodermata	1	2.0	1	0.1
	Other Taxa	1	2.0	1	0.1
	Total	51		668	
12	Annelida	55	49.1	378	26.6
	Mollusca	16	14.3	319	22.4
	Arthropoda	32	28.6	696	49.0
	Echinodermata	3	2.7	7	0.5
	Other Taxa	6	5.4	21	1.5
	Total	112		1,421	
13	Annelida	15	57.7	1,024	84.6
	Mollusca	5	19.2	79	6.5
	Arthropoda	2	7.7	82	6.8
	Echinodermata	2	7.7	24	2.0
	Other Taxa	2	7.7	2	0.2
	Total	26		1,211	
14	Annelida	43	58.1	976	58.7
	Mollusca	10	13.5	382	23.0
	Arthropoda	17	23.0	190	11.4
	Echinodermata	2	2.7	107	6.4
	Other Taxa	2	2.7	7	0.4
	Total	74		1,662	

Table 4. Continued:

Stratum	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
15	Annelida	59	59.0	1,053	38.4
	Mollusca	16	16.0	1,252	45.6
	Arthropoda	20	20.0	199	7.2
	Echinodermata	2	2.0	232	8.5
	Other Taxa	3	3.0	9	0.3
	Total	100		2,745	
16	Annelida	45	52.9	475	40.4
	Mollusca	17	20.0	394	33.5
	Arthropoda	15	17.6	95	8.1
	Echinodermata	2	2.4	204	17.4
	Other Taxa	6	7.1	7	0.6
	Total	85		1,175	
17	Annelida	69	50.7	949	45.5
	Mollusca	17	12.5	573	27.5
	Arthropoda	44	32.4	498	23.9
	Echinodermata	1	0.7	16	0.8
	Other Taxa	5	3.7	48	2.3
	Total	136		2,084	
18	Annelida	53	41.7	337	22.6
	Mollusca	22	17.3	698	46.8
	Arthropoda	46	36.2	404	27.1
	Echinodermata	2	1.6	37	2.5
	Other Taxa	4	3.1	14	0.9
	Total	127		1,490	
19	Annelida	18	52.9	458	57.6
	Mollusca	6	17.6	34	4.3
	Arthropoda	7	20.6	289	36.4
	Echinodermata	2	5.9	13	1.6
	Other Taxa	1	2.9	1	0.1
	Total	34		795	
20	Annelida	33	62.3	1,656	76.4
	Mollusca	9	17.0	99	4.6
	Arthropoda	8	15.1	393	18.1
	Echinodermata	1	1.9	17	0.8
	Other Taxa	2	3.8	3	0.1
	Total	53		2,168	
21	Annelida	46	49.5	1,378	78.3
	Mollusca	13	14.0	144	8.2
	Arthropoda	30	32.3	228	12.9
	Echinodermata	1	1.1	3	0.2
	Other Taxa	3	3.2	8	0.5
	Total	93		1,761	

Table 4. Continued:

Stratum	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
22	Annelida	43	54.4	1,284	60.3
	Mollusca	10	12.7	212	10.0
	Arthropoda	22	27.8	591	27.7
	Echinodermata	1	1.3	39	1.8
	Other Taxa	3	3.8	4	0.2
	Total	79		2,130	
23	Annelida	84	57.9	610	43.7
	Mollusca	14	9.7	118	8.5
	Arthropoda	39	26.9	605	43.4
	Echinodermata	2	1.4	36	2.6
	Other Taxa	6	4.1	26	1.9
	Total	145		1,395	
24	Annelida	74	54.8	530	33.4
	Mollusca	24	17.8	790	49.7
	Arthropoda	30	22.2	233	14.7
	Echinodermata	3	2.2	12	0.8
	Other Taxa	4	3.0	23	1.4
	Total	135		1,588	
25	Annelida	77	63.1	903	63.1
	Mollusca	19	15.6	303	21.2
	Arthropoda	20	16.4	208	14.5
	Echinodermata	1	0.8	5	0.3
	Other Taxa	5	4.1	11	0.8
	Total	122		1,430	
26	Annelida	63	56.3	729	69.0
	Mollusca	21	18.8	177	16.7
	Arthropoda	19	17.0	120	11.4
	Echinodermata	2	1.8	8	0.8
	Other Taxa	7	6.3	23	2.2
	Total	112		1,057	
27	Annelida	61	55.0	718	45.2
	Mollusca	17	15.3	593	37.4
	Arthropoda	26	23.4	258	16.3
	Echinodermata	2	1.8	3	0.2
	Other Taxa	5	4.5	15	0.9
	Total	111		1,587	
28	Annelida	74	55.2	714	38.0
	Mollusca	16	11.9	334	17.8
	Arthropoda	38	28.4	810	43.1
	Echinodermata	0	0.0	0	0.0
	Other Taxa	6	4.5	20	1.1
	Total	134		1,878	

Table 4. Continued:

Stratum	Phylum	No. of Taxa	% of Total	No. of Individuals	% of Total
29	Annelida	34	64.2	461	61.1
	Mollusca	6	11.3	238	31.6
	Arthropoda	9	17.0	45	6.0
	Echinodermata	1	1.9	2	0.3
	Other Taxa	3	5.7	8	1.1
	Total	53		754	
30	Annelida	79	59.8	962	61.7
	Mollusca	21	15.9	411	26.3
	Arthropoda	27	20.5	177	11.3
	Echinodermata	1	0.8	2	0.1
	Other Taxa	4	3.0	8	0.5
	Total	132		1,560	
31	Annelida	49	58.3	1,511	63.5
	Mollusca	16	19.0	729	30.6
	Arthropoda	14	16.7	132	5.5
	Echinodermata	2	2.4	3	0.1
	Other Taxa	3	3.6	4	0.2
	Total	84		2,379	
32	Annelida	62	64.6	2,825	88.2
	Mollusca	18	18.8	220	6.9
	Arthropoda	11	11.5	152	4.7
	Echinodermata	2	2.1	3	0.1
	Other Taxa	3	3.1	4	0.1
	Total	96		3,204	

Table 5. Continued:

Taxa	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Annelida																
Oligochaeta																
Tubificidae (LPIL)	10.1															
Polychaeta																
Cirratulidae (LPIL)				22.0	53.6	16.5			13.4					10.6	35.6	28.2
<i>Cossura</i> (LPIL)																24.6
<i>Levinsenia gracilis</i>											14.5		18.7			
<i>Nephtys cornuta</i>			26.3	25.7		14.0							15.9	10.3		
<i>Pholoe glabra</i>																
Arthropoda																
Malacostraca																
<i>Cheirimeдея zotea</i>																
<i>Eudorella pacifica</i>			31.8	17.4		17.8										
<i>Eudorellopsis</i> sp. A							27.4									
Lysianassidae Genus G																
<i>Munnogonium tillerae</i>													10.8			
<i>Photis</i> (LPIL)																
<i>Protomeдея articulata</i>													10.6			
<i>Rhepoxynius daboius</i>																
Echinodermata																
Ophiuroidea																
Ophiuroidea (LPIL)																
Mollusca																
Bivalvia																
<i>Axinopsida serricata</i>											15.2		20.3			
<i>Ennucula tenuis</i>																
Mytilidae (LPIL)																
<i>Nutricula tantilla</i>																
<i>Rochefortia tumida</i>																
<i>Semele rubropicta</i>									10.3		10.8				20.6	
Gastropoda																
<i>Alvania compacta</i>		31.4						28.5		7.3						

Table 6. Continued:

Stratum	Station	Taxa	Indvs	Density	Mean No. Taxa	Taxa (SD)	Mean Density	Density (SD)	Total No. Taxa	Total No. Individuals	H' Diversity	J' Evenness
21	166	67	471	11775	45.3	20.6	14675.0	9560.8	93	1761	2.40	0.53
21	167	43	276	6900								
21	168	26	1014	25350								
22	169	59	742	18550	37.0	19.3	17750.0	3715.2	79	2130	2.88	0.66
22	170	23	840	21000								
22	171	29	548	13700								
23	172	31	278	6950	54.8	27.5	8718.8	1893.3	145	1395	3.56	0.71
23	173	31	451	11275								
23	174	76	308	7700								
23	175	81	358	8950								
24	176	86	740	18500	67.7	16.3	13233.3	6786.3	135	1588	3.51	0.72
24	177	62	625	15625								
24	178	55	223	5575								
25	115	38	303	7575	50.5	9.3	8937.5	1576.6	122	1430	3.61	0.75
25	179	50	417	10425								
25	180	54	407	10175								
25	181	60	303	7575								
26	182	50	263	6575	58.0	12.2	8808.3	4737.8	112	1057	3.81	0.81
26	183	52	224	5600								
26	184	72	570	14250								
27	185	38	373	9325	46.5	14.7	9918.8	4725.5	111	1587	3.36	0.71
27	186	65	592	14800								
27	187	32	147	3675								
27	188	51	475	11875								
28	189	50	225	5625	51.5	5.4	11737.5	10586.6	134	1878	3.76	0.77
28	190	53	1100	27500								
28	191	45	221	5525								
28	192	58	332	8300								

Figure 1. Station location for the for Puget Sound strata, June 1998.

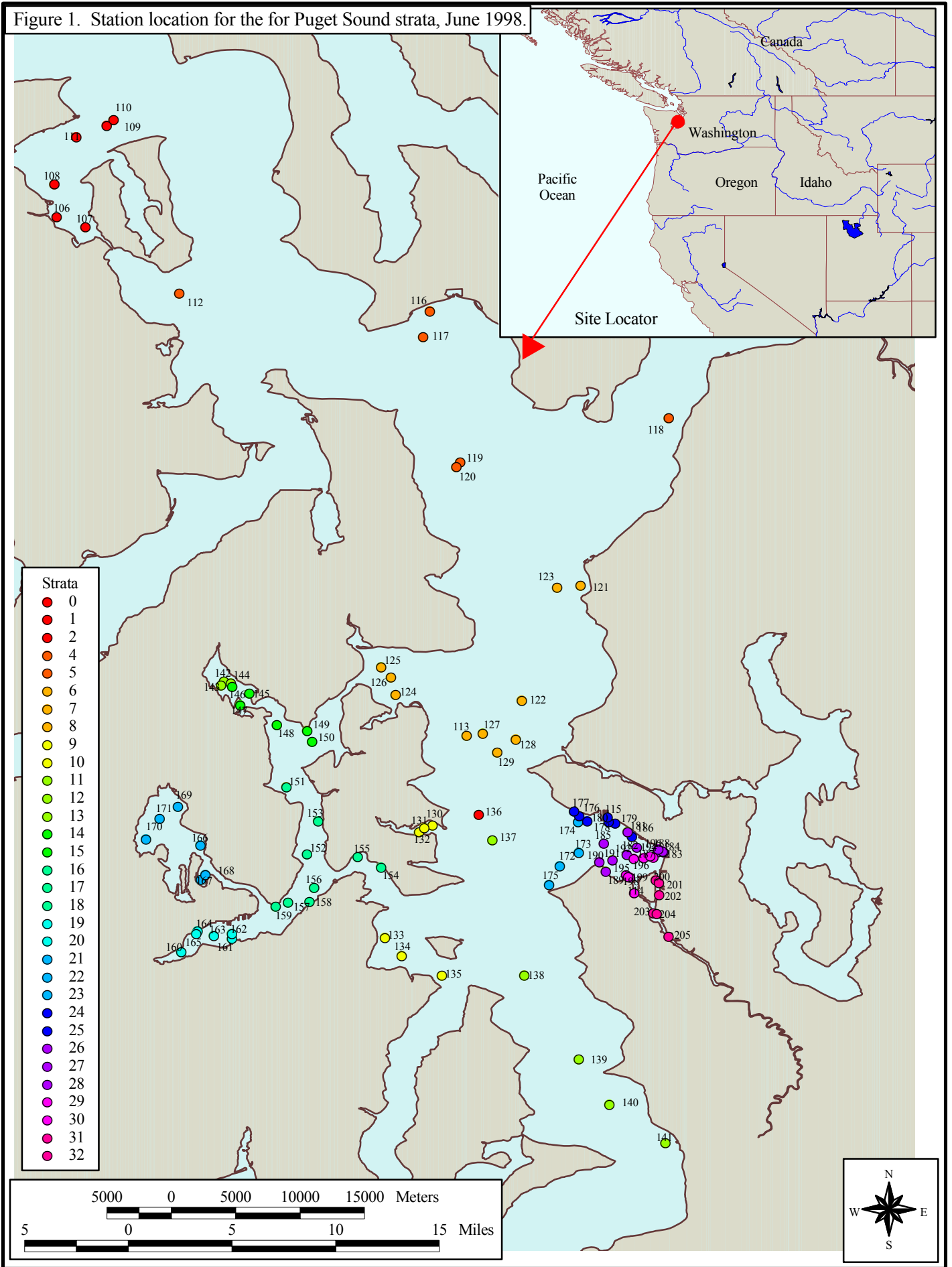


Figure 2. Station locations for the Puget Sound stations, 1997 and 1998.

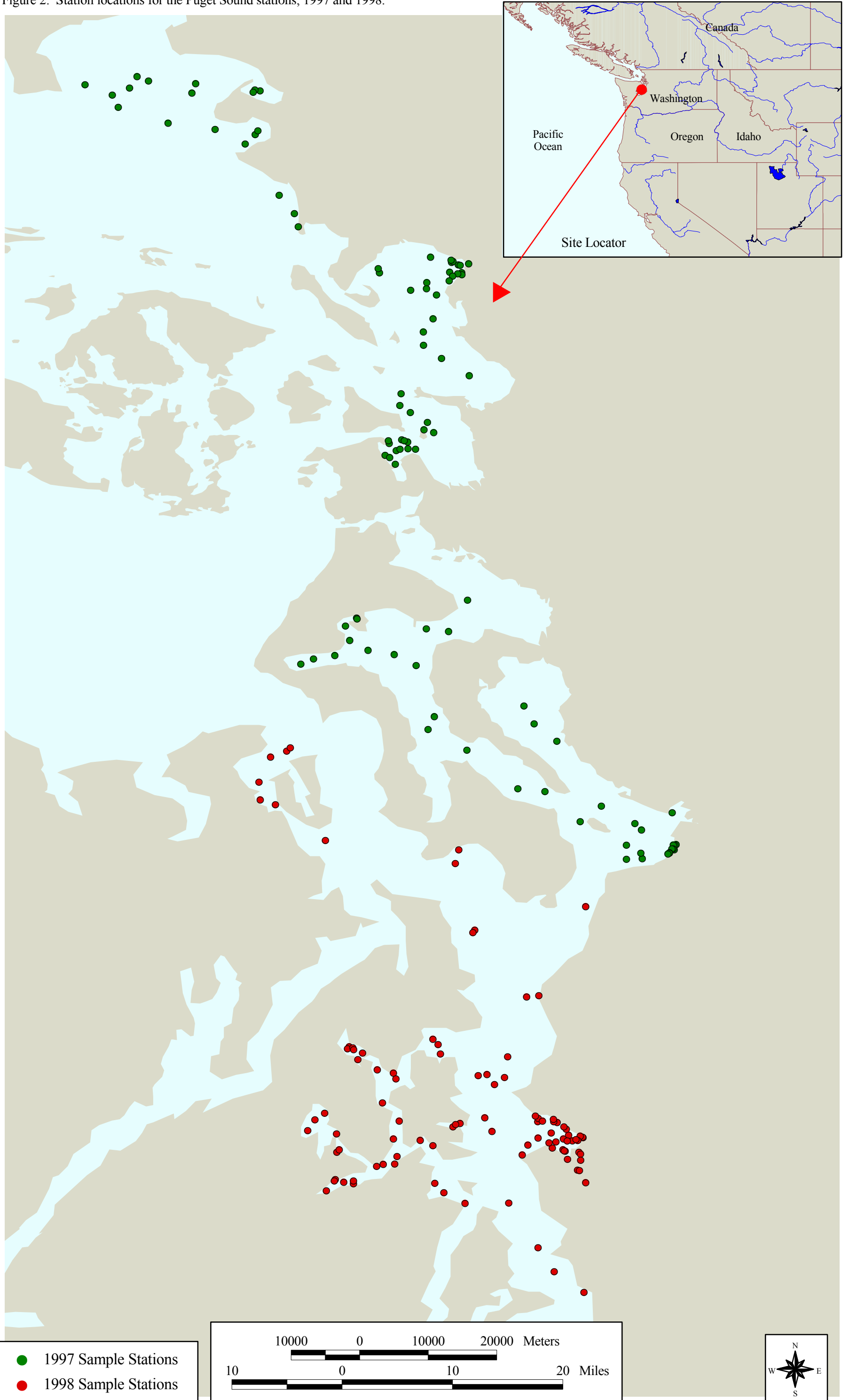


Figure 3. Percent abundance of major taxonomic groups for the Puget Sound strata, June 1998.

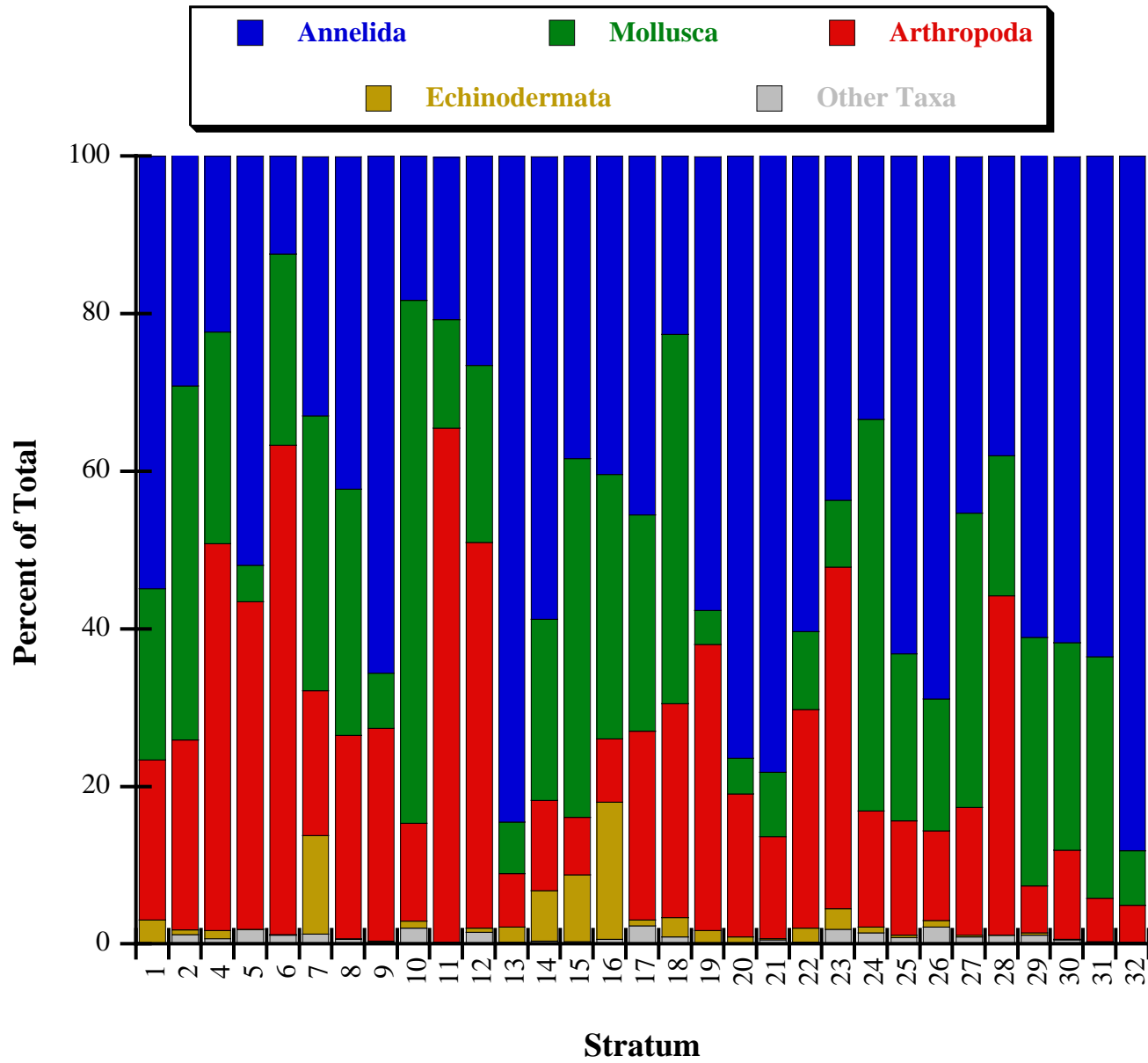


Figure 4. Mean macroinvertebrate density for the Puget sound strata, June 1998.

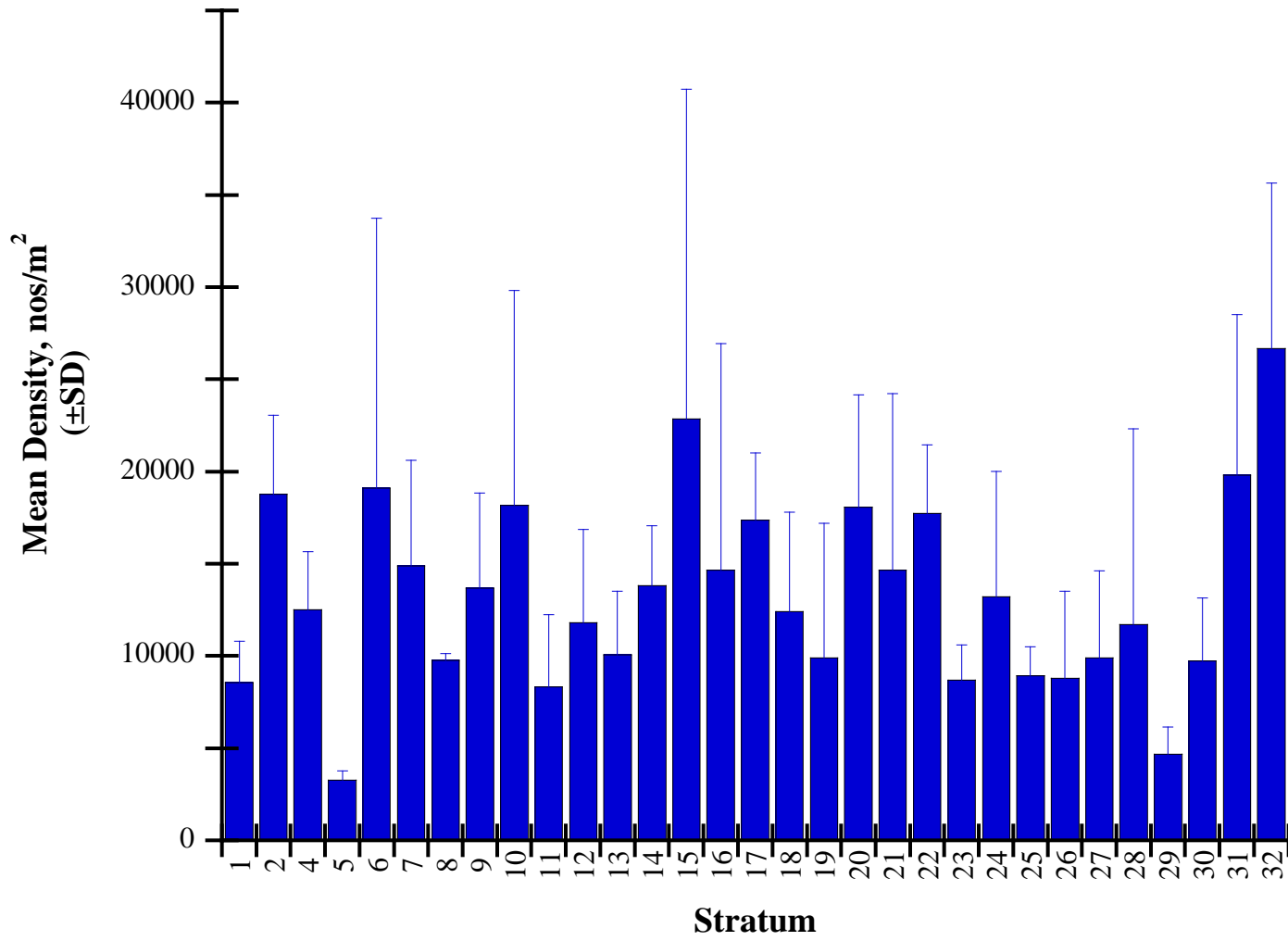


Figure 5. Spatial distribution of mean macroinvertebrate density for the Puget Sound stations, June 1998.

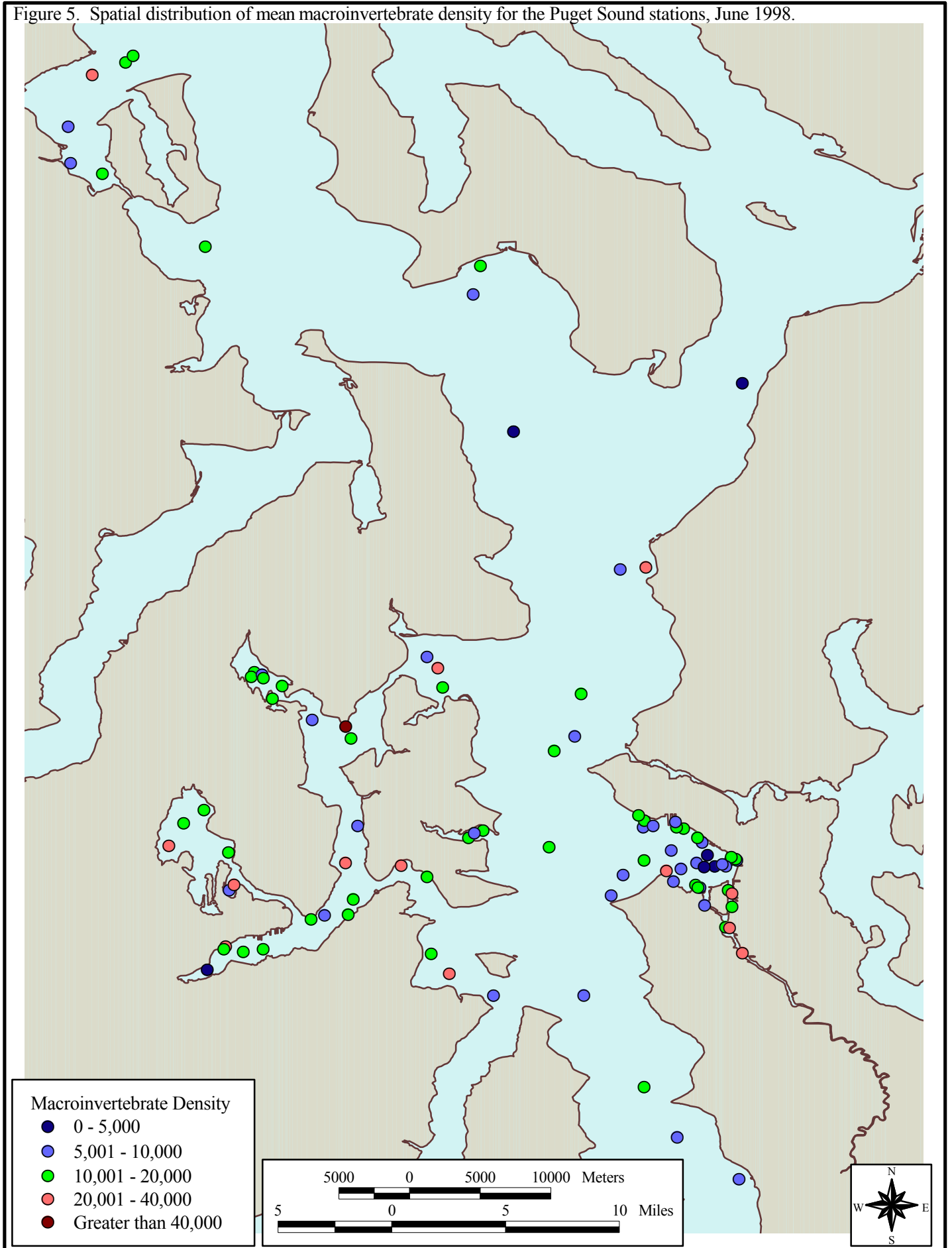


Figure 6. Mean number of taxa for the Puget Sound strata, June 1998.

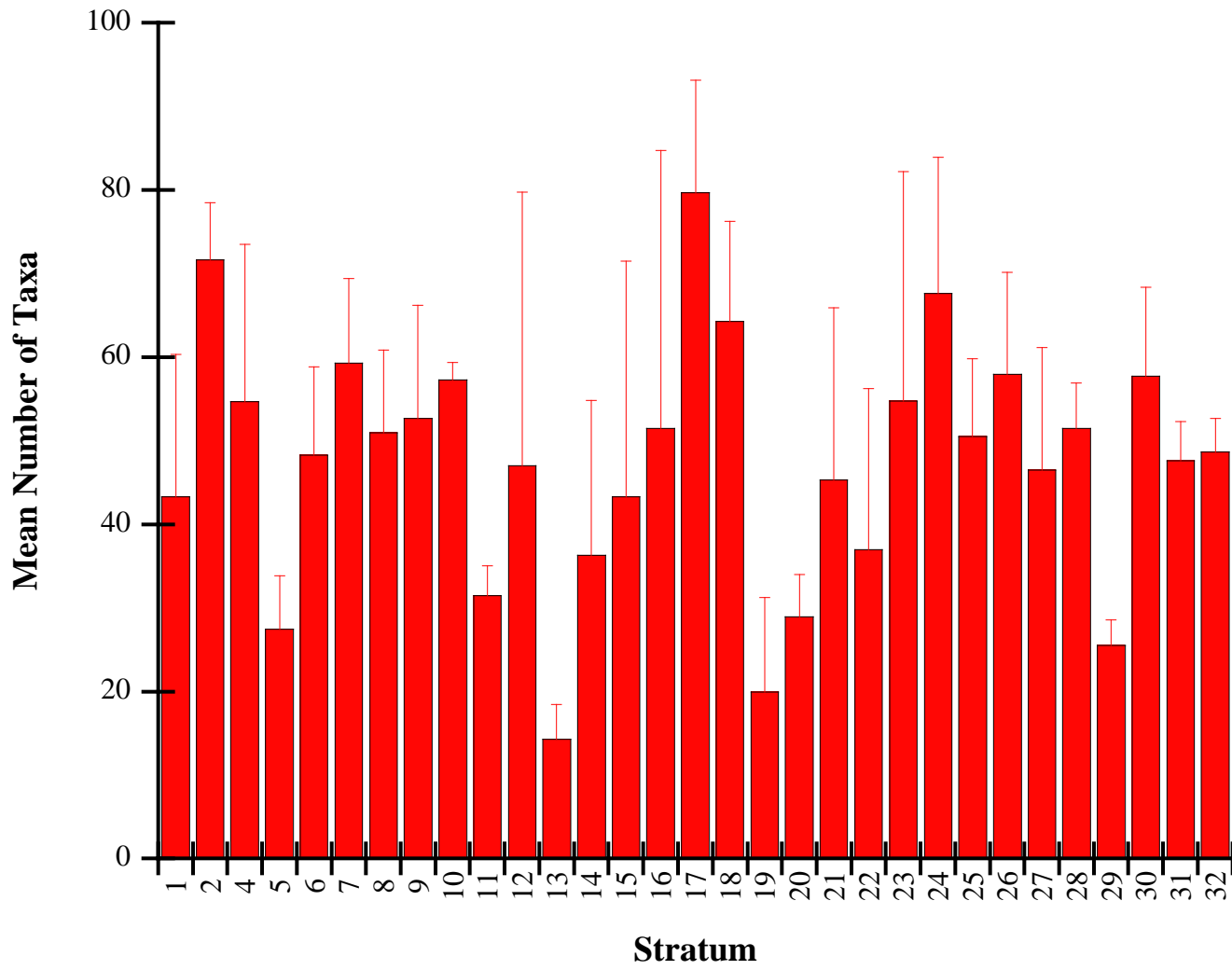


Figure 7. Spatial distribution of mean number of taxa for the Puget Sound stations, June 1998.

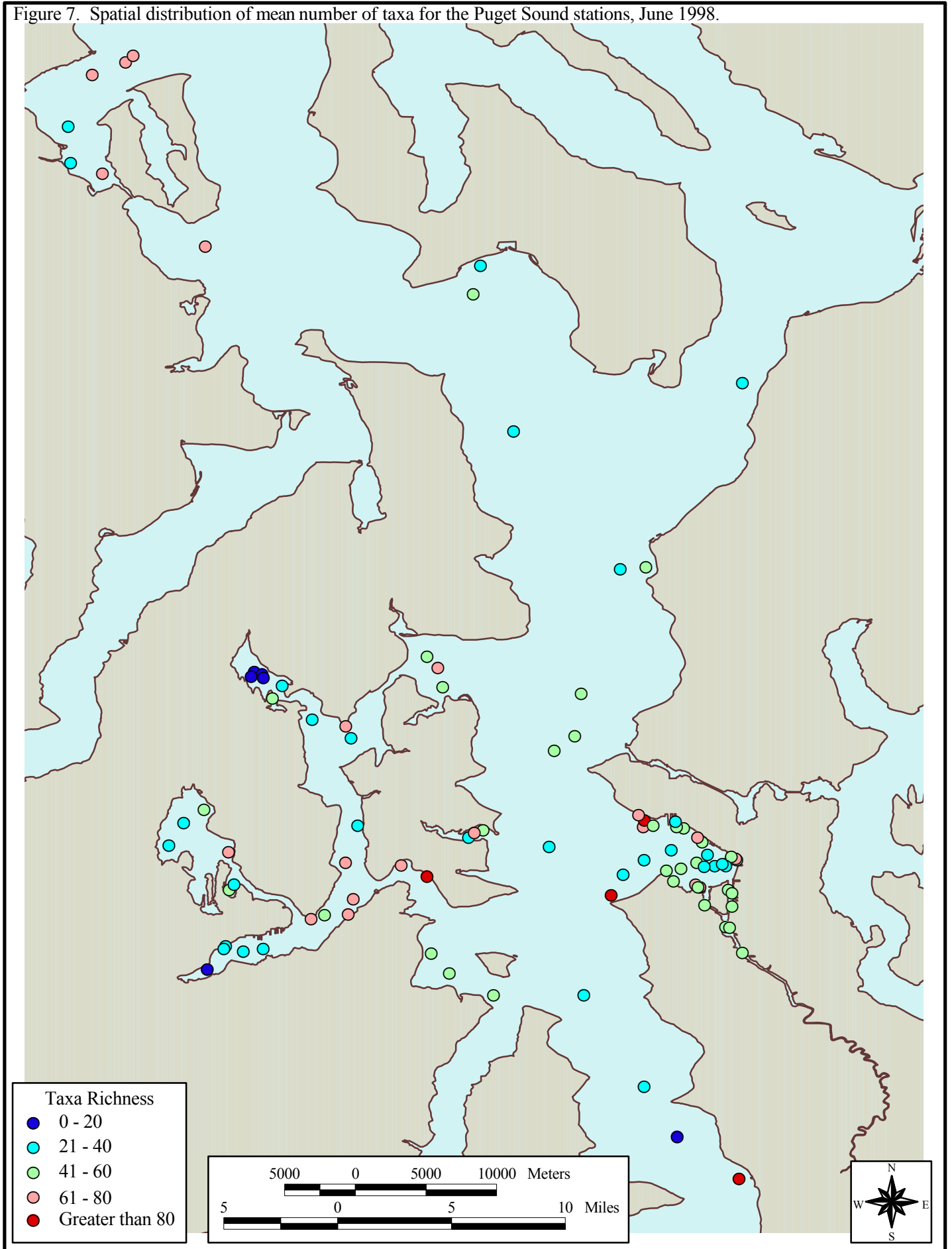


Figure 8. Taxa diversity (H') for the Puget Sound strata, June 1998.

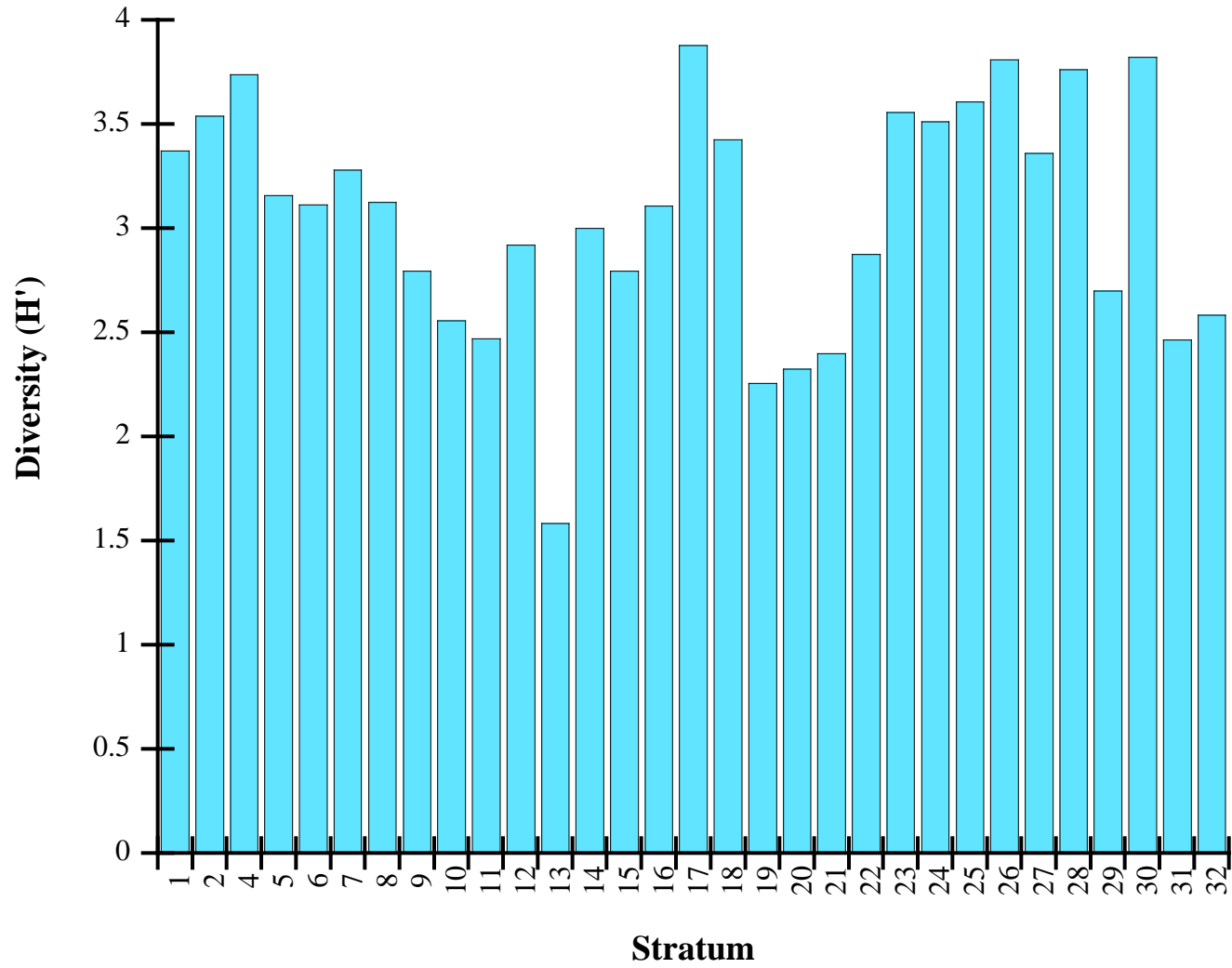


Figure 9. Spatial distribution of taxa diversity (H') for the Puget Sound stations, June 1998.

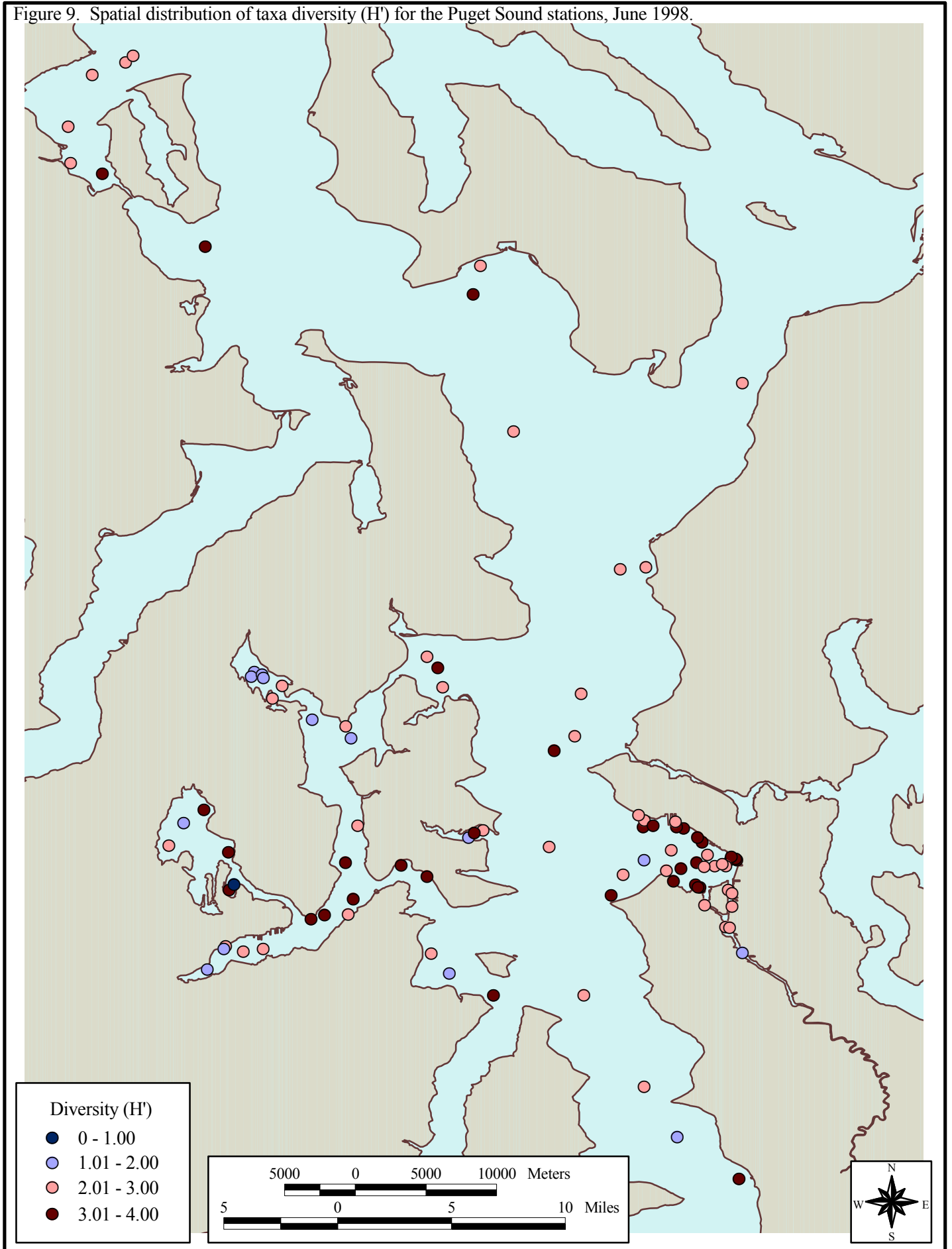


Figure 10. Taxa evenness (J') for the Puget Sound strata, June 1998.

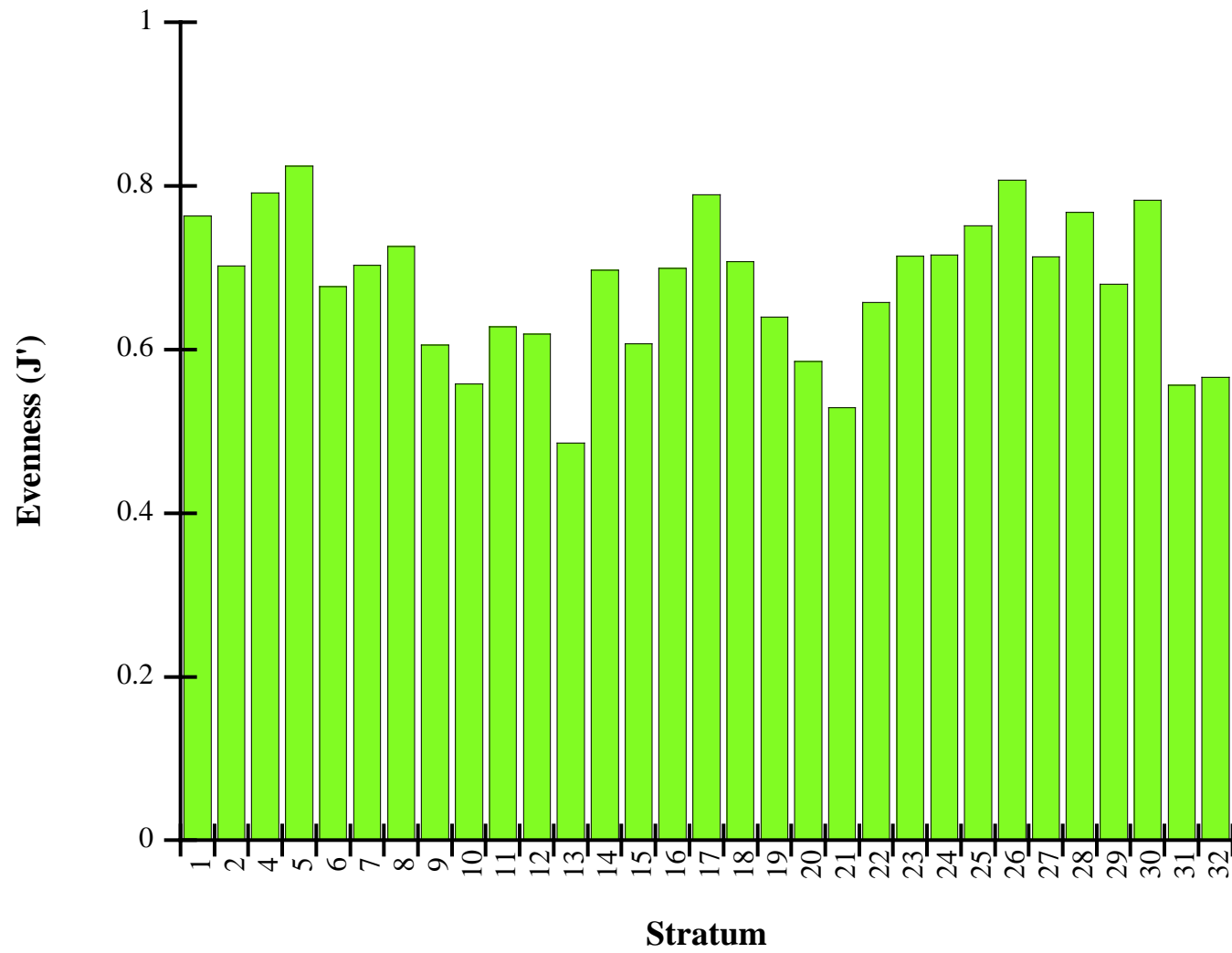
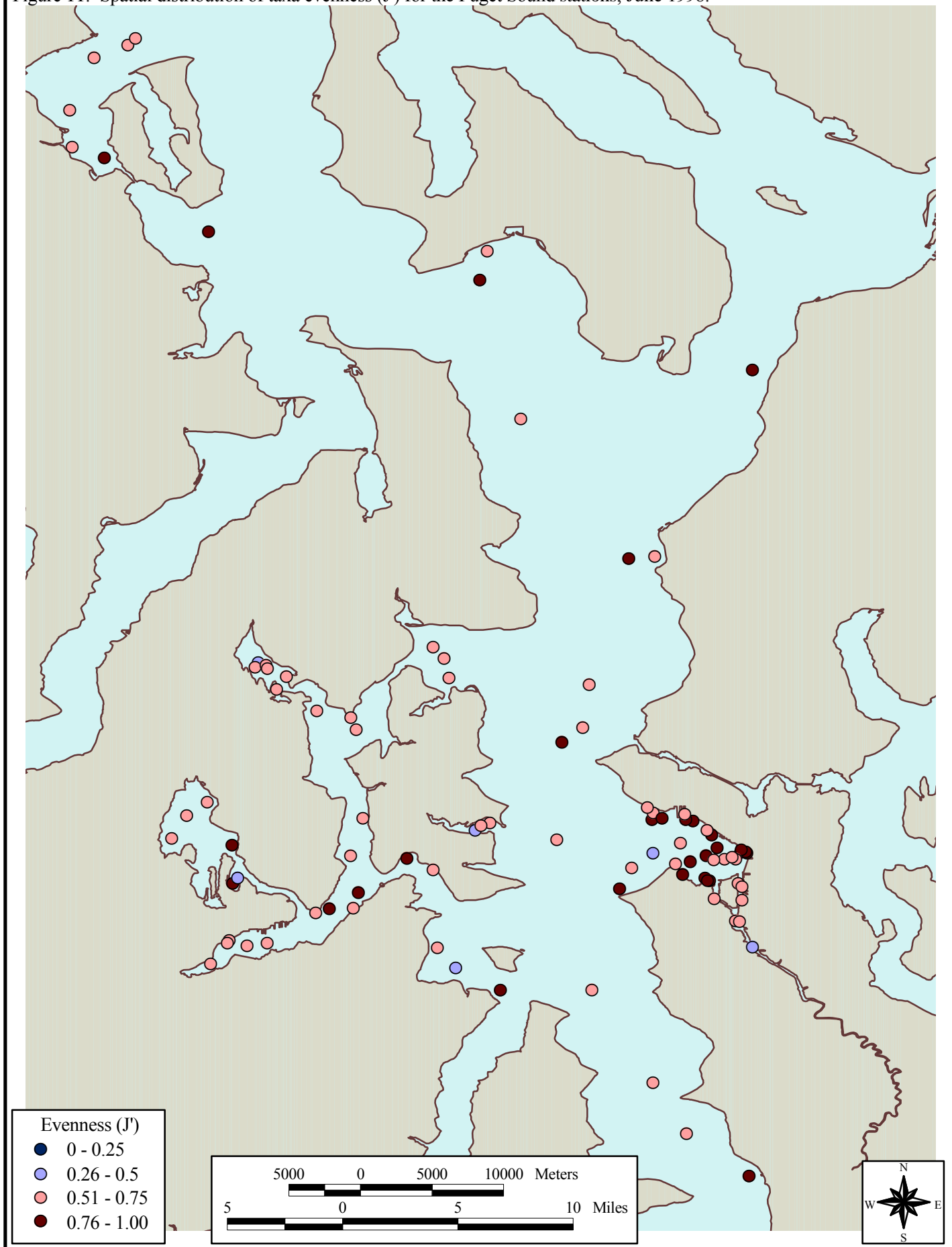


Figure 11. Spatial distribution of taxa evenness (J') for the Puget Sound stations, June 1998.



APPENDIX

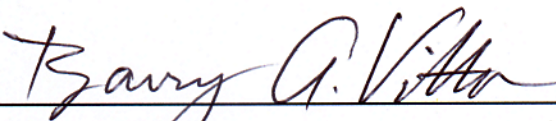
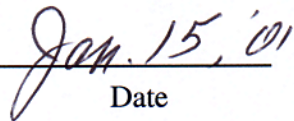
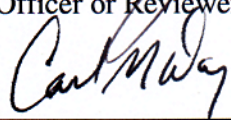
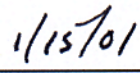
QUALITY ASSURANCE STATEMENT

Client/Project NOAA
Work Assignment Title 1998 Puget Sound
Work Assignment Number **Task Number DO 5**

Description of Data Set or Deliverable: 94 Benthic macroinvertebrate samples collected June 1998; Young Dredge grabs.

Description of audit and review activities: Judged accuracy rates were well above standard levels for sorting and taxonomy. Laboratory QC reports were completed. Copies of QC results follow (see attachment.) All taxonomic data were entered into computer and printed. This list was checked for accuracy against original taxonomic data sheets.

Description of outstanding issues or deficiencies which may affect data quality: None

	
_____ Signature of QA Officer or Reviewer	_____ Date
	
_____ Signature of Project Manager	_____ Date

QUALITY CONTROL REWORKS

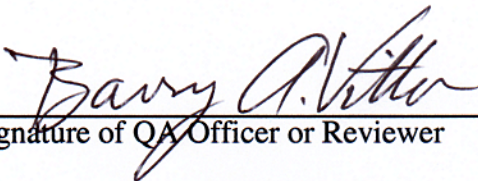
Client/Project NOAA-Puget Sound 1998
Work Assignment Title

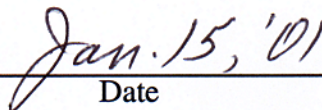
Task Number DO 5

Sorting Results:	Sample #	% Accuracy
	196	99%
	170	100%
	108	99%
	185	99%
	137	100%
	179	99%
	143	99%
	172	99%
	131	100%
	178	98%

Taxonomy Results:	Sample #	Taxa	% Accuracy
	129	Crust./Moll.	96%
	137	Crust./Moll.	98%
	141	Crust./Moll.	96%
	149	Crust./Moll.	99%
	165	Crust./Moll.	100%
	174	Crust./Moll.	98%
	176	Crust./Moll.	97%
	192	Crust./Moll.	98%
	203	Crust./Moll.	100%
	106	Poly./Misc.	99%
	116	Poly./Misc.	99%
	122	Poly./Misc.	99%
	139	Poly./Misc.	100%
	142	Poly./Misc.	99%
	150	Poly./Misc.	99%
	160	Poly./Misc.	98%
	167	Poly./Misc.	99%
	185	Poly./Misc.	99%
	195	Poly./Misc.	97%

Description of outstanding issues or deficiencies which may affect data quality: None


Signature of QA Officer or Reviewer


Date

Appendix A3. Comments on dominant LPIL taxa for the Puget Sound strata, June 1998.

Taxon Name	Phylum	Class	No. of Individuals	% of Total	Comments
<i>Cirratulidae</i> (LPIL)	Ann	Poly	4845	9.71	anterior fragment, posterior needed for specis ID.
<i>Nephtys cornuta</i>	Ann	Poly	4072	8.16	
<i>Eudorella pacifica</i>	Art	Mala	2468	4.95	
<i>Axinopsida serricata</i>	Mol	Biva	2426	4.86	
<i>Rochefortia tumida</i>	Mol	Biva	2046	4.1	
<i>Semele rubropicta</i>	Mol	Biva	1949	3.91	
<i>Alvania compacta</i>	Mol	Gast	1932	3.87	
<i>Eudorellopsis</i> sp. A	Art	Mala	1339	2.68	
<i>Pholoe glabra</i>	Ann	Poly	1325	2.66	
<i>Levinsenia gracilis</i>	Ann	Poly	1163	2.33	
<i>Cossura</i> (LPIL)	Ann	Poly	1126	2.26	specimen fragmented, must have pygidium for species ID.
<i>Tubificidae</i> (LPIL)	Ann	Olig	1033	2.07	sexually immature
<i>Aphelochaeta monilaris</i>	Ann	Poly	1023	2.05	
<i>Bivalvia</i> (LPIL)	Mol	Biva	822	1.65	crushed and/or juvenile specimen.
<i>Ophiuroidea</i> (LPIL)	Ech	Ophi	821	1.65	central disk missing characters.
<i>Photis</i> (LPIL)	Art	Mala	799	1.6	immature specimen.
<i>Nutricola tantilla</i>	Mol	Biva	663	1.33	
<i>Rhepoxynius daboius</i>	Art	Mala	604	1.21	
<i>Prionospio</i> (LPIL)	Ann	Poly	588	1.18	missing identification characters
<i>Ennucula tenuis</i>	Mol	Biva	568	1.14	
<i>Prionospio lighti</i>	Ann	Poly	568	1.14	
<i>Mediomastus</i> (LPIL)	Ann	Poly	502	1.01	anterior portions only, pygidium needed for species ID.