2005 Full Monitoring at the Anderson/Ketron Islands PSDDA Disposal Site

Analysis of Archived Benthic Samples Supplemental Data Report

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List of Acronyms and Abbreviations

BCOC	bioaccumulative chemical of concern
cm	centimeter(s)
cy	cubic yard(s)
DMMP	Dredged Material Management Program
DNR	Department of Natural Resources
m	meter(s)
mm	millimeter(s)
OSI	organism sediment index
P	probability of significant difference
PSDDA	Puget Sound Dredged Disposal Analysis
QA/QC	Quality Assurance/Quality Control
SAIC	Science Applications International Corporation
SQS	Washington State Sediment Quality Standards
SVPS	sediment vertical profiling system
t	calculated t-test value
TTL	target tissue level

1.0 INTRODUCTION

This report presents the results of the archived benchmark and transect benthic sample analysis conducted in support of the 2005 full environmental monitoring of the Anderson/Ketron Islands non-dispersive dredged material disposal site, located near Steilacoom, WA. This report is a supplement to the 2005 Full Monitoring at Anderson/Ketron Islands Report (SAIC 2005), prepared by Science Applications International Corporation (SAIC) under contract to the Washington State Department of Natural Resources (DNR).

2.0 BACKGROUND

The Anderson/Ketron Island dredged material disposal site was established in 1989 by the Puget Sound Dredged Disposal Analysis (PSDDA) program during the Phase II studies for northern and southern Puget Sound (PSDDA, 1989a,b).[1] To date, the disposal site has received little use, with a total of 32,826 cubic yards (cy) of dredged material placed at the site since 1989.

2.1 2005 Full Monitoring Results

The results from the 2005 full monitoring survey at the Anderson/Ketron Islands disposal site indicated a relatively healthy benthic community (SAIC 2005). The sediment vertical profiling system (SVPS) survey showed well developed benthic communities (Stage III) at every station sampled, including the onsite stations. The Organism Sediment Index (OSI) values were relatively high throughout the site, including the disposal zone, where the mean OSI value was 8.7. OSI values higher than 6.0 are generally indicative of healthy benthic habitat. PSDDA Site Condition II chemical criteria were not exceeded (PSDDA 1988a), and offsite tissue chemistry showed that all bioaccumulative chemicals of concern (BCOCs) were below target tissue levels (TTL) and within the 1989 derived guideline values. However, the 2005 benthic community analysis found a significant decrease in the abundance of arthropods in comparison to the 1989 baseline data.

In accordance with the PSDDA monitoring framework (Table 1), analysis of benchmark benthic samples was initiated to evaluate the decrease of arthropod abundance. In particular, the analysis is conducted to address Hypothesis No. 6: *No significant decrease in the abundance of dominant benthic infaunal species collected down current (transect stations) of the disposal site has occurred due to dredged material disposal.*

2.2 Role of Benchmark Stations in Site Monitoring

Benchmark stations are located in the vicinity of the disposal site (i.e., within the same embayment), to document the changes in benthic conditions in the general area. At the Anderson/Ketron site, the benchmark stations are located in areas that are not expected to be affected by disposal operations, but have similar physical and geo-chemical conditions as the disposal site.[2] Temporal changes in benchmark station conditions are expected to reflect area-wide changes in benthic conditions, rather than changes due to dredged material disposal.

[1] The full monitoring program conducted in July 2005; this was the first monitoring event conducted at the Anderson/Ketron site since completion of the baseline studies (PSDDA 1989b).
[2] At some PSDDA sites (e.g., Elliott Bay), benchmark stations are also situated between the disposal site and known sources of contamination that could influence conditions near the disposal site (i.e., Seattle waterfront).

Under the PSDDA monitoring program, changes observed at onsite or offsite stations are compared to pre-disposal baseline conditions and/or regulatory screening criteria (PSDDA 1988b). If evaluation of the offsite monitoring station data (transect and perimeter stations) indicates that changes in conditions in key parameters (e.g., sediment chemistry, tissue chemistry, benthos) exceeded established monitoring triggers, then archived benchmark station samples are analyzed and compared to appropriate baseline benchmark levels. The results of this benchmark comparison lead to one of the following hypotheses:

1. If the arithmetic means of the benchmark monitoring and baseline data are not significantly different, then changes observed at offsite areas potentially reflect an impact from dredged material disposal.

2. If the arithmetic means of the benchmark monitoring and baseline data are significantly different, but that difference is less than 50 percent of the difference between the offsite station monitoring and baseline data, then the changes in offsite areas potentially reflect an impact from dredged material disposal.

3. If the arithmetic means of the benchmark monitoring and baseline data are significantly different, but that difference is greater than 50 percent of the difference of the offsite station monitoring and baseline data, then the changes in offsite areas likely reflect regional changes in conditions that are unrelated to dredged material disposal.

After assessing the benchmark data, if offsite changes are concluded to be due to regional changes (Hypothesis 3), then no further action is required. Alternatively, if analysis of benchmark data indicates that changes at offsite stations are potentially due to dredged material disposal (Hypotheses 1 and 2), then further evaluation and/or review of PSDDA dredged material disposal site management practices may be warranted.

3.0 STUDY OBJECTIVES

During the 1989 baseline survey at the Anderson/Ketron site, benthic sample processing required the collection and analysis of the entire box core sample and sieving the sample through a 1.0 mm sieve. Under current sampling protocols, the top 10 cm of each box core is washed through nested sieves of 1.0 mm and 0.5 mm. The core section greater than 10 cm depth is washed through a 1.0 mm sieve. Only the 1.0 mm fraction of the top 10 cm sample is initially analyzed. To provide a better comparison to the 1989 baseline data, the greater than 10 cm sample was analyzed for the 2005 benchmark and transect stations. These results will be combined with the top 10 cm fraction to evaluate Objective 1:

> *Objective 1 – Address Hypothesis No. 6 of the PSDDA monitoring framework. Evaluate the decrease of arthropod abundance at downstream (transect) stations by analyzing the benchmark benthic infauna samples.*

The seasonal die-off of adult benthic organisms and the recruitment of juveniles to the benthos are generally expected to occur in late spring-early summer. Benthic sample collections for the 2005 monitoring survey at the Anderson/Ketron site occurred June 29–July 1, 2005, and may have coincided with this seasonal event. Benthic sample collections for the 1989 baseline survey occurred May 1–2, 1989, which may be before the seasonal die-off and juvenile recruitment. Most arthropods are relatively small in size (e.g., cumaceans, harpacticoid copepods, etc.) and might not be retained on a 1.0 mm sieve, particularly as juveniles. Therefore, the 0.5 mm sieve fraction from the top 10 cm was analyzed for the transect and benchmark stations to address Objective 2:

> *Objective 2 – Evaluate whether the differences in arthropod abundances between the 1989 and 2005 surveys are due to the difference in timing of the surveys (i.e., presence of juvenile arthropods in the 0.5 mm sieve fraction instead of adult arthropods in the 1.0 mm sieve fraction).*

In addition, due to the length of time since the baseline studies at the Anderson/Ketron Islands disposal site, the Dredged Material Management Program (DMMP) agencies have proposed that the results of the 2005 full monitoring program be used as a new baseline to compare to for future monitoring events. Thus, the DMMP agencies require a sound and robust benthic data set for the Anderson/Ketron site that is a suitable baseline for future decision making.

4.0 BENTHIC COMMUNITY ANALYSIS

Benthic infauna samples were collected at three transect stations (AKT01, AKT02, and AKT03) and three benchmark stations (AKB02, AKB03, and AKB07) at the Anderson/Ketron Islands disposal site during the June 2005 monitoring survey (Figure 1). All stations were sampled using a 0.06 m^2 Gray-O'Hara box core. Each box core sample was divided into two fractions, from the sample surface to a depth of 10 cm, and all sediments greater than 10 cm depth. The top 10 cm fraction was rinsed through 1.0 mm and 0.5 mm stacked sieve screens, while the deeper fraction was rinsed only through the 1.0 mm mesh sieve. Initially, the greater than 10 cm fraction and the 0.5 mm mesh fraction were archived.

Five replicate samples were collected for benthic community analysis at each station. Initially, the five replicate samples from the benchmark stations were archived for future analysis. The benthic community analysis completed and reported on (SAIC 2005) indicated that there were statistically significant reductions in the abundance of arthropods at the three transect stations compared to those same stations sampled during the Anderson/Ketron baseline survey in 1989. A statistical comparison was also made between the 2005 transect stations and one benchmark station sampled in 1989 (AKB02). This analysis also indicated a significant reduction in arthropod abundance. These reductions in arthropod abundance triggered the processing and analysis of the 2005 benchmark station samples to determine whether the reductions were due to the disposal of dredged material or to a regional shift in the benthic community structure.

In 1989, unlike the current methodology, the replicate samples from the entire box core were processed instead of just the top 10 cm. As a result, the DNR and the DMMP decided to analyze the remaining portion of the box core samples for all replicates collected in 2005. The 2005 data from the entire box core were then statistically compared to the 1989 data to determine if the reductions were caused by the change in methodology. The decision was also made to process and analyze the samples collected on the 0.5 mm sieve screens. However, only the top 10 cm fraction of the box core was sieved through the 0.5 mm screen.

The following benthic community endpoints were determined and calculated for each benthic replicate sample.

- Annelid abundance
- Mollusca abundance
- Arthropod abundance
- Miscellaneous taxa abundance
- Total taxa abundance
- Total and major taxa richness
- Shannon-Wiener Diversity Index
- Swartz Dominance Index
- Evenness Index

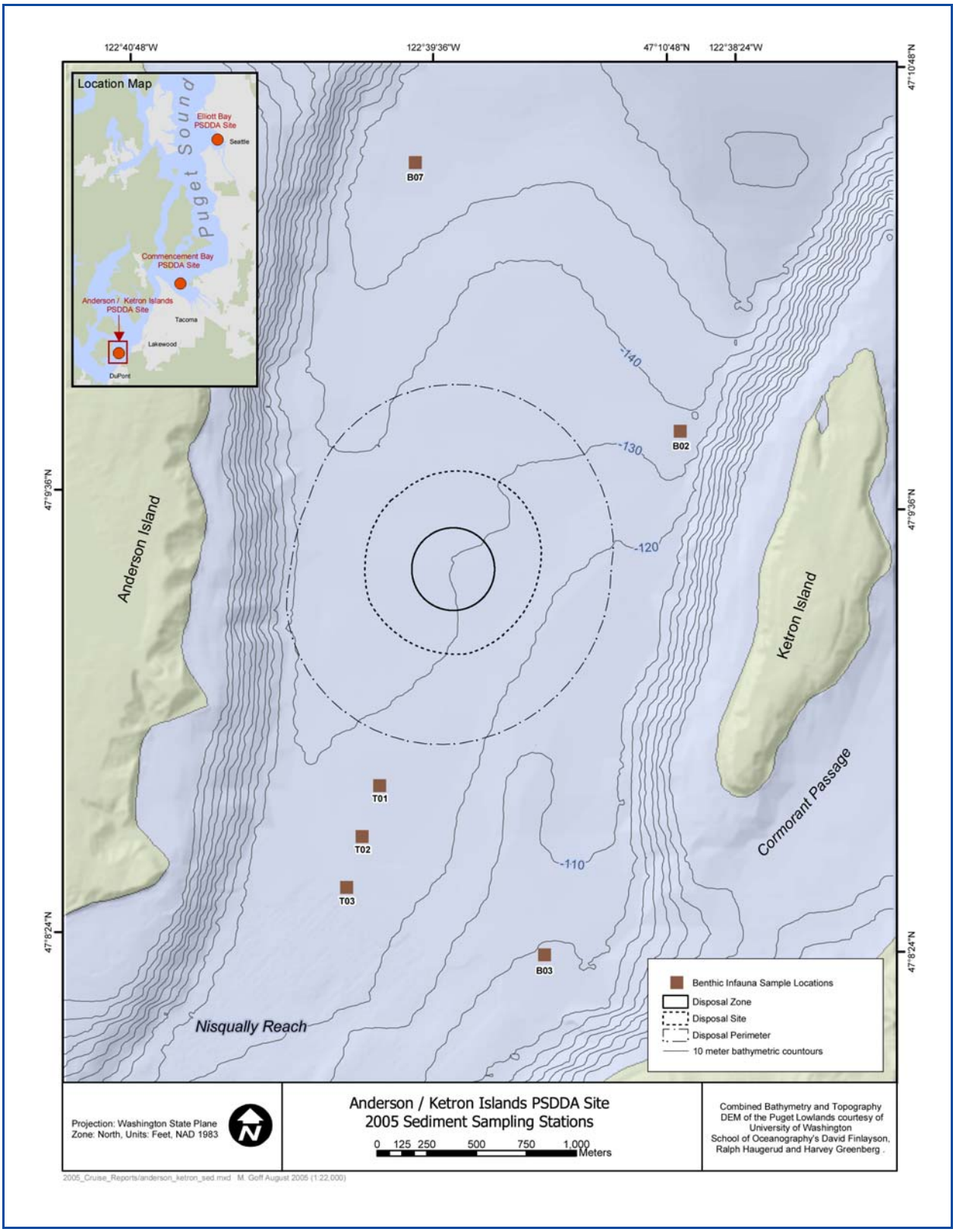

Figure 1. Anderson/Ketron Sediment and Tissue Sampling Stations in 2005

4.1 Benthic Community From 1989

The baseline monitoring event at the Anderson/Ketron Island disposal site was conducted by PTI (1989). In 1989, benthic infauna samples were collected at seven stations and only samples from three transect stations (AKT01, AKT02, and AKT03) and one benchmark station (AKB02) were analyzed for the abundance of the major taxonomic groups. Samples were not analyzed to the lowest taxonomic level possible. As a result, species richness data are not available to compare to samples collected during the 2005 monitoring survey.

Results from the 1989 baseline sampling event are presented in Table 2. The results show that all four stations sampled and analyzed at the Anderson/Ketron disposal site were strongly dominated by crustacean arthropods. Polychaetous annelids were the next most abundant taxa group but at most represented fewer than 50 percent of the arthropod abundance.

4.2 2005 Benthic Community in the Top 10 cm—1.0 mm Sieve Fraction

The following discussion describes the benthic communities at the transect and benchmark stations during the 2005 survey. The community description is based on samples collected from the upper 10 cm portion of the Gray-O'Hara box core sampler.

4.2.1 Transect Stations

The three transect stations sampled during the 2005 survey are at similar water depths (127 to 130 meters) with sediment grain size ranging from 37 to 55 percent fines (silt and clay). The greatest total abundance was found at station AKT02, with average values of 108.2 individuals per 0.06 m^2. The station with the greatest number of taxa was AKT03 where 35.2 taxa were found (Table 3). Annelids were the dominant taxa group at all stations with the greatest mean total abundance occurring at Station AKT03 with 51.0 individuals per 0.06 m^2. The molluscs were the next most dominant taxa group with the greatest mean total abundance occurring at Station AKT01 with 40.0 individuals per 0.06 m^2. The greatest abundance of arthropods occurred at Station AKT03 with a mean of 18.6 individuals per 0.06 m^2. Shannon-Wiener diversity, Pielou evenness index, and Swartz dominance index increased slightly with distance from the disposal site. However, the variability, as measured by the sample standard deviation, indicates that the differences may not be significant. Biomass values (grams/0.06m^2) for the 2005 stations are presented in Table 4. Among the transect stations, the greatest total biomass was found at Station AKT02 with a mean value of 5.33 grams/0.06m^2. The biomass of polychaetes dominated the transect stations with the exception of Station AKT02, where biomass was dominated by the burrowing echiuroid *Arhynchite pugettensis*. Table 5 lists the 10 most dominant species observed at each of the transect stations. The bivalve *Axinopsida serricata* and the polychaete *Levinsenia gracilis* very strongly dominated the benthic community at all transect stations. Subdominant taxa, which were found at much lower abundances than the dominant taxa, included *Parvilucina tenuisculpta, Pinixxa occidentalis cmplx, Euphilomedes carcharodonta,* and *Protomedeia* sp.

4.2.2 Benchmark Stations

The three benchmark stations sampled in the 2005 survey were at water depths from 100 to 159 meters, with grain size ranging from 16 to 29 percent fines. The greatest total abundance was found at station AKB02 with average values of 181.6 individuals per 0.06 m^2. The station with the greatest number of taxa was AKB07 where 48 taxa were found (Table 6). Annelids were the

dominant taxa group at stations AKB02 and AKB03, with the greatest mean total abundance occurring at station AKB03 with 97.4 individuals per 0.06 m^2. At station AKB07, annelids and mollusks were co-dominant with 55.0 and 56.8 individuals per 0.06 m^2, respectively. The arthropods were the next most dominant taxa group at stations AKB02 and AKB03, with the greatest mean total abundance occurring at station AKB02 with 53.4 individuals per 0.06 m^2. The Shannon-Wiener diversity index was similar at all three benchmark stations, ranging from 2.7 to 3.2. Similarly, Pielou's evenness index was consistently at 0.8 at all three stations. Swartz dominance index was essentially the same at stations AKB02 and AKB03 with values of 10.2 and 9.8, respectively. However, the dominance index at Station AKB07 was much greater than at the other stations with a value of 16.0.

Biomass values (grams/0.06m^2) for the 2005 survey stations are presented in Table 7. Among the benchmark stations the greatest total biomass was found at station AKB07 with a mean value of 10.22 grams/0.06m^2. Among the major taxa groups, the annelids had the greatest biomass ranging from 3.85 to 4.67 grams/0.06m^2. Table 8 lists the 10 most dominant species observed at each of the benchmark stations. The polychaete *Levinsenia gracilis* and the ostracod crustacean *Euphilomedes carcharodonta* were the dominant organisms at stations AKB02 and AKB03. At Station AKB07, the dominant organisms were *Euphilomedes carcharodonta* and the bivalve *Axinopsida serricata*. Subdominant taxa included the commensal crab *Pinixxa occidentalis Cmplx* and the ophiuroid *Amphiodia urtica/periercta*.

4.2.3 Percent Juveniles at Transect and Benchmark Stations in 2005

The percentage of juveniles at transect and benchmark stations is presented in two ways: organized by major taxa groups, and organized by the dominant and subdominant species. The results show that the miscellaneous phyla and the molluscs contained the greatest proportion of juveniles, although the taxa group that contained the greatest proportion varied from station to station (Table 9). The miscellaneous phyla had the greatest percentage of juveniles at stations AKT02, AKT03, AKB02, and AKB03. The molluscs had a greater percentage at station AKT01, and a slightly greater percent at station AKB07.

Table 10 shows the proportion of juveniles by the dominant and subdominant species at the transect stations. The numerically dominant species were not necessarily those with the greatest percentage of juveniles. The dominant species at the transect stations were *Axinopsida serricata* and *Levinsenia gracilis*, yet juvenile *Axinopsida serricata* only accounted for 33.7 to 46.3 percent of the abundance, and there were no juvenile *Levinsenia gracilis*. At stations AKT01 and AKT02, three species consistently had the greatest percentage of juveniles: the bivalves *Parvilucina tenuisculpta* and *Macoma* spp., and sea pens in the Order *Pennatulacea*. The ophiuroid *Amphiodia urtica/periercta* had the greatest numbers of juveniles at station AKT03. While *Parvilucina tenuisculpta* was present at AKT03, the percent represented by juvenile individuals was half of that found at the other two transect stations.

The two most dominant species at the benchmark stations were *Levinsenia gracilis* and *Euphilomedes carcharodonta*. As seen at the transect stations, the abundance of these dominant species was represented by virtually no juvenile organisms (Table 10). The polychaete *Glycera nana* and the ophiuroid *Amphiodia urtica/periercta* at station AKB02, *Amphiodia urtica/periercta* and *Parvilucina tenuisculpta* at station AKB03, and *Parvilucina tenuisculpta* and the gastropod *Olivella baetica* at station AKB07 had the highest percentage of juveniles for the benchmark stations.

4.3 2005 Benthic Community in the Top 10 cm—0.5 mm Sieve Fraction

The following discussion describes the benthic communities on the 0.5 mm mesh sieve at the transect and benchmark stations during the 2005 survey. The community description is based on samples from the upper 10 cm portion of the Gray-O'Hara box core.

4.3.1 Transect Stations

The mean total abundance of organisms on the 0.5 mm mesh sieve was over 5 times greater than seen on the 1.0 mm sieve (Table 11). The range in total abundance was from 612.6 individuals per 0.06 m^2 at station AKT02 to 704 individuals per 0.06 m^2 at station AKT03. Station AKT03 contained the highest number of taxa with 44.8 taxa per 0.06 m^2. In general, the abundance of all taxa groups was greater on the 0.5 mm mesh sieve. However, at two of the three stations, the most abundant group was different from that at the 1.0 mm sieve fraction. Molluscs were the dominant taxa group at stations AKT01 and AKT02, with the greatest mean total abundance occurring at station AKT01 with 413.4 individuals per 0.06 m^2. At station AKT03, annelids were the largest taxa group where 366.4 individuals per 0.06 m^2 were found. The annelids were the next most dominant taxa group at stations AKT01 and AKT02, with the greatest mean total abundance occurring at station AKT01 with 250 individuals per 0.06 m^2. At station AKT03, molluscs were found with an abundance of 208.4 individuals per 0.06 m^2. The greatest abundance of arthropods occurred at station AKT02 with a mean of 72.2 individuals per 0.06 m^2.

Shannon-Wiener diversity and Pielou evenness index were not substantially different from that on the 1.0 mm sieve fraction. Shannon-Wiener diversity ranged from 2.62 to 2.71 with the highest found at station AKT03, and Pielou's index ranged from 0.68 to 0.73 with the highest found at station AKT02. The Swartz dominance index was close to four points lower on the 0.5 mm sieve than on the 1.0 mm sieve. The highest value was found at station AKT03 (7.8) and the lowest value was at station AKT01 (6.4).

Biomass values (grams/0.06m^2) for the 0.5 mm sieve fraction are presented in Table 12. Among the transect stations, the greatest mean total biomass was found at station AKT02 with a mean value of 0.216 grams/0.06m^2. The taxa group with the greatest biomass were the annelids. Mean annelid biomass ranged from 0.079 to 0.127 grams/0.06m^2, with the highest amount at station AKT02. Table 13 lists the 10 most dominant species observed at each of the transect stations in the 0.5 mm sieve fraction. At stations AKT01 and AKT02, unidentifiable bivalves, *Axinopsida serricata*, and the polychaete *Pectinaria californiensis* very strongly dominated the benthic community. Subdominant taxa at these two stations included the bivalve *Rochefortia tumida*, the polychaete *Nephtys cornuta*, and the bivalve *Parvilucina tenuisculpta*. The dominant taxa at station AKT03 were the polychaete *Pectinaria californiensis*, the bivalve *Axinopsida serricata*, and the polychaete *Levinsenia gracilis*.

4.3.2 Benchmark Stations

The total abundance and the abundance of major taxa groups in the 0.5 mm sieve fraction at the benchmark stations were similar to the transect stations. The greatest total abundance was found at station AKB02 with average values of 761.4 individuals per 0.06 m^2. The station with the greatest number of taxa was AKB07 where 51 taxa were found (Table 14). Annelids were the dominant taxa group at all three stations with the mean abundance ranging from 339.8 to 460.4 individuals per 0.06 m^2, with the greatest abundance found at station AKB03. The molluscs were co-dominant with abundances from 127 individuals per 0.06 m^2 at station AKB03 to 225.8 individuals per 0.06

m^2 at station AKB02. The arthropods, while present at all stations, were found at much lower abundances. Abundance ranged from 51.2 individuals per 0.06 m^2 at station AKB03 to 110.6 individuals per 0.06 m^2 at station AKB02.

Shannon-Wiener diversity and Pielou's evenness index were similar at all three benchmark stations. Shannon-Wiener ranged from 2.71 to 2.79 with the highest at station AKB02. The evenness index was consistently at 0.7 at all three stations. Swartz dominance index was essentially the same at stations AKB02 and AKB03 with values of 8.2 and 8.0, respectively. The dominance index at station AKB07 was slightly greater than at the other stations with a value of 9.2.

Biomass values (grams/0.06m^2) on the 0.5 mm sieve at the benchmark stations are presented in Table 15. Among the benchmark stations, the greatest mean total biomass was found at station AKB02 with a mean value of 0.235 grams/0.06m^2. Among the major taxa groups the annelids had the greatest mean biomass ranging from 0.061 to 0.164 grams/0.06m^2, with the largest occurring at station AKB02.

Table 16 lists the 10 most dominant species observed at each of the benchmark stations. The polychaete *Pectinaria californiensis* and unidentifiable bivalves were the dominant species at stations AKB03 and AKB07, and *Pectinaria californiensis* was the second most abundant species at station AKB02. Abundances of *Pectinaria californiensis* ranged from a mean of 202 individuals per 0.06 m^2 at station AKB02 to 207.6 individuals per 0.06 m^2 at station AKB07. *Axinopsida serricata* was the dominant species at station AKB02. While *Axinopsida serricata* was present at the other two stations, the abundance was much lower. *Levinsenia gracilis* and the ostracod crustacean *Euphilomedes carcharodonta* were the subdominant organisms at station AKB02, and were among the top 10 species at stations AKB03 and AKB07.

4.3.3 Percent Juveniles on the 0.5 mm Sieve at Transect and Benchmark Stations

As previously described, two methods were used to examine the presence of juvenile organisms. The majority of organisms on the 0.5 mm mesh sieve were classified as juveniles at both transect and benchmark stations. At the transect stations, juveniles ranged from 91.4 percent at station AKT03 to 92.7 percent at station AKT01. At the benchmark stations, juveniles ranged from a low of 87.7 percent at station AKB03 to 93.1 percent at station AKB07. The results consistently show that the molluscs contained the greatest proportion of juveniles at all stations, although the other taxa groups were only a few percentage points lower (Table 17). The annelids and arthropods had lower percentages at all transect and benchmark stations and the arthropods had lower percentages at benchmark stations than at transect stations.

Table 18 shows the proportion of juveniles by the dominant and subdominant species. Unlike the 1.0 mm sieve fraction, the numerically dominant species on the 0.5 mm sieve also had the greatest percentage of juveniles. *Axinopsida serricata*, unidentifiable bivalves, and *Pectinaria californiensis* were the top three dominant species at all transect stations and all were classified as juveniles. At station AKT03, the polychaete *Levinsenia gracilis* was the third most abundant species but only 62 percent were juveniles. This species along with *Nephtys cornuta* had the lowest proportion of juveniles at the transect stations. A similar pattern was seen at the benchmark stations. At station AKB02, *Axinopsida serricata*, *Pectinaria californiensis*, and *Levinsenia gracilis* were the top three dominant species. *Axinopsida serricata* and *Pectinaria californiensis* were all juveniles while *Levinsenia gracilis* consisted of 47.2 percent juveniles. *Pectinaria*

californiensis and unidentifiable bivalves were also the most abundant species at stations AKB03 and AKB07 and were juveniles.

4.4 Comparison of Benthic Communities between the 1989 and 2005 Transect and Benchmark Stations—Top 10 cm Fraction

The statistical comparison between the 1989 transect and benchmark stations and the 2005 transect stations indicated there were statistically significant reductions in the abundance of arthropods at the transect stations (SAIC 2005). This reduction triggered the processing and analysis of the 2005 benchmark stations to determine whether the reduction was caused by the disposal of dredged material or was a region-wide phenomenon. Statistical comparisons between the 2005 transect and benchmark stations can be found in Table 19. A statistical comparison was also made between the 1989 and 2005 benchmark stations. The tests were conducted using a one tailed t-test with an alpha value of 0.05 as the significance level. Statistical analysis was conducted using the statistical software package SYSTAT (Vers. 11.01).

The comparison between benchmark station AKB02 and the three transect stations indicated that there were statistically significant reductions in abundance in all taxa groups, except for the molluscs. A greater abundance of molluscs was observed at the transect stations, but the results were insignificant. The comparison between benchmark station AKB03 and the three transect stations also indicated that there were statistically significant reductions in the abundance of all taxa groups, except for molluscs. In this case, a statistically significant increase in the abundance of molluscs was observed. The comparison between stations AKB07 and AKT01 found significant reductions in the miscellaneous phyla and in the total abundance of organisms, but no significant changes between the molluscs, arthropods, and annelids. There were significant reductions between station AKB07 and transect stations AKT02 and AKT03 for the total abundance, and the abundance of molluscs and arthropods. A comparison was also made between the 1989 benchmark station AKB02 and the 2005 benchmark stations. These results indicated that there were statistically significant increases in the total abundance and in the abundance of miscellaneous phyla, the molluscs, and the annelids in 2005. However, there was a significant reduction in the abundance of arthropods.

4.5 2005 Benthic Community in Entire Box Core Sample—1.0 mm Sieve Fraction

In 1989, the PSDDA field sampling methodology called for the entire box core sample to be processed. The methodology changed in subsequent years and now only the top 10 cm is processed. The new method also required that the remaining portion of the sample be archived for analysis should the need arise. With the significant reduction in the abundance of arthropods between the 1989 and 2005 transect stations (SAIC 2005) and the significant reductions in abundance between the 2005 benchmark and transect stations, it was decided to process and analyze the remaining portion of the box core samples to determine if the significant reductions may have been caused by the change in field processing methods.

4.5.1 Transect Stations

The mean total abundance at the transect stations ranged from 123.6 to 137 individuals per 0.06 m^2, with little difference between AKT02 and AKT03 (the two stations with the greatest abundance) (Table 20). The annelids were the most abundant taxa group. Abundance ranged from 63.4 to 72.2 individuals per 0.06 m^2, with the lowest abundance at station AKT01 and the highest at station AKT02. The molluscs were the second most abundant taxa group with the highest

abundance occurring at station AKT01 with 41.4 individuals per 0.06 m^2. The greatest number of taxa was at station AKT03 (41.0 taxa per 0.06 m^2), and the lowest number was at station AKT01 (33.4 taxa per 0.06 m^2). The annelids had the greatest numbers of taxa at all stations with the highest at station AKT03 (23.6 taxa per 0.06 m^2) and the lowest at station AKT01 (18.2 taxa per 0.06 m^2).

Shannon-Wiener diversity, Pielou's evenness index, and Swartz's dominance index values all increased with distance from the disposal site in a pattern similar to that found in the top 10 cm fraction. Shannon-Wiener diversity ranged from 2.7 (AKT01) to 3.2 (AKT03). Pielou's evenness index was similar at all three stations ranging from 0.8 at stations AKT01 and AKT02 to 0.9 at station AKT03. The Swartz dominance index ranged from 10.6 at AKT01 to 14.6 at station AKT03.

The difference in benthic community metrics between the top 10 cm data and the entire box core data is presented in Table 21. Stations AKT02 and AKT03 gained the most in mean total abundance, increasing by 21.0 and 22.8 percent, respectively. The majority of these increases can be attributed to the increased abundance of annelids in the entire box core samples. Annelids increased from 27.4 percent at station AKT01 to 31.9 percent at station AKT02. As seen with the abundance data, an increase in the numbers of taxa was also observed when the whole box core was analyzed. The mean total number of taxa increased 18.6 percent at station AKT01, 18.9 percent at station AKT02, and 14.1 percent at station AKT03. While the percentages do not reflect it, the annelids gained the greatest numbers of species when the entire box core was processed and analyzed. Shannon-Wiener diversity and Pielou's evenness index remained essentially unchanged. The Swartz's dominance index increased at stations AKT02 and AKT03 (increased of 2.0 and 2.4 taxa, respectively).

Biomass values for the entire box core samples at the transect stations are presented in Table 22. Among the transect stations, the greatest total biomass was found at station AKT02 with a mean value of 25.0 grams/0.06m^2. The large biomass at this station was caused by the presence the burrowing echiuroid *Arhynchite pugettensis* (miscellaneous phyla). The biomass range for the miscellaneous phyla group was from 1.3 to 8.2 grams/0.06m^2. In addition to *Arhynchite pugettensis*, members of the order Pennatulacea (sea pens) and *Stylatula elongate* (sea whips) added to the biomass at the transect stations. Molluscan biomass ranged from 1.6 grams/0.06m^2 at stations AKT02 and AKT03 to 11.6 grams/0.06m^2 at station AKT01. This large biomass was due the presence of the large individual mollusc *Compsomyax subdiaphana* in one replicate sample. Other than the presence of a few single large individuals, the annelids as a group contained the largest biomass.

The difference in biomass between the top 10 cm fraction and the entire box core can be seen on Table 23. The difference was greatest at station AKT01 where there was a 19.98 grams/0.06m^2 increase over the top 10 cm fraction. This increase, as described above, was due the presence of a single large mollusc. A similar difference in total biomass was also observed at station AKT02 (19.68 grams/0.06m^2). This was caused primarily by the large polychaete *Glycera robusta*. At station AKT03, there was a 17.13 grams/0.06m^2 increase above the top 10 cm fraction. However, no single identifiable species was responsible for the increase. Table 24 lists the 10 most dominant species observed at each of the transect stations. As seen in the top 10 cm fraction, the bivalve *Axinopsida serricata* and the polychaete *Levinsenia gracilis* very strongly dominated the benthic community at all transect stations even when the entire box core sample was processed. The same subdominant taxa that were found in the upper top 10 cm fraction were still dominant in the entire

box core. These taxa included *Parvilucina tenuisculpta*, *Pinixxa occidentalis cmplx*, *Euphilomedes carcharodonta,* and *Protomedeia* sp. A greater number of *Pinixxa occidentalis cmplx*. was found in the deeper part of the box core because they are commensal crabs that inhabit the tubes and burrows of other organisms.

4.5.2 Benchmark Stations

The mean total abundance at the Benchmark stations ranged from a mean of 209.6 to 226.2 individuals per 0.06 m^2, with the greatest being found at station AKB03 (Table 25). Annelids were the most abundant taxa group at all benchmark stations, comprised of 94.4 individuals per 0.06 m^2 at station AKB02, 143.8 individuals per 0.06 m^2 at station AKB03, and 81.8 individuals per 0.06 m^2 at station AKB07. The arthropods were the second most abundant taxa group at stations AKB02 (59.2 individuals per 0.06 m^2) and AKB03 (49.0 individuals per 0.06 m^2), while molluscs were the second most abundant taxa after the annelids at station AKB07 (62.2 individuals per 0.06 m^2).

The greatest number of taxa occurred at station AKB07, where 57.8 taxa per 0.06 m^2 were found. The annelids contained the greatest number of taxa at all three stations, followed by molluscs and arthropods. Shannon-Wiener diversity ranged from 2.9 (AKB03) to 3.4 (AKB07), and Pielou's evenness index was varied around 0.8 at all stations. Swartz dominance index ranged from 10.8 at station AKB03 to 18.2 at station AKB07.

A 13.4 percent increase in mean total abundance was observed between the top 10 cm data and the entire box core data at station AKB02 (Table 26). The majority of the increased abundance was due to additional annelids found in the deeper fraction. Station AKB03 had a 25.0 percent increase in mean total abundance and station AKB07 had a 20.0 percent increase. In both cases, the annelids accounted for the majority of that increase. The increased abundance of molluscs varied from 8.7 percent at station AKB07 to 15.7 percent at station AKB03. Arthropods increased from 9.4 percent at station AKB03 to 10.9 percent at AKB07. Station AKB07 had a 17 percent increase in the total number of taxa, gaining an additional 9.8 taxa when the deeper box core was processed. Of these additional taxa, 6.4 were annelids. Stations AKB02 (14.5 percent increase) and AKB03 (16 percent increase) gaining 6.6 and 6.8 taxa, respectively. Of the 6.6 taxa at station AKB02, 5.0 of them were annelids. At station AKB03, 4.6 of the 6.6 new taxa were annelids.

A very slight increase in the Shannon-Wiener diversity index was observed and the Pielou's evenness index was virtually unchanged. The Swartz's dominance index increased 13.7 percent at station AKB02, 9.3 percent at station AKB03, and 12.1 percent at AKB07.

Biomass values for the entire box core samples at the benchmark stations are presented in Table 22. The station with the mean greatest total biomass was station AKB02, with a mean value of 41.5 grams/0.06m^2. The large biomass at this station was due to the presence of large polychaete annelids. The mean biomass range for the miscellaneous phyla was from 0.5 (station AKB02) to 6.6 grams/0.06m^2 (station AKB07). Mean molluscan biomass ranged from 0.5 grams/0.06m^2 at station AKB02, 7.1 grams/0.06m^2 at station AKB07, to 8.9 grams/0.06m^2 at station AKB03. The large biomass at AKB03 was due to the presence of *Compsomyax subdiaphana* in one replicate sample in the greater than 10 cm fraction. Other than the presence of a few single large individuals, the annelids as a group contained the largest biomass. The difference in biomass between the top 10 cm fraction and the entire box core can be seen in Table 23. The difference was greatest at station AKB02, where a 36.5 grams/0.06m^2 increase over the top 10 cm fraction

was observed. This increase, as described above, was due the presence of a few large polychaete annelids. The increase in biomass at station AKB03 was caused by a large *Compsomyax subdiaphana*, and the increase at station AKB07 was caused by the bivalve *Macoma nasuta*.

Table 27 lists the 10 most dominant species observed at each of the benchmark stations. The polychaete *Levinsenia gracilis* and the ostracod crustacean *Euphilomedes carcharodonta* were the dominant organisms at station AKB02. The same subdominant taxa that were found in the top 10 cm fraction were still present as subdominant in the entire box core. These taxa included the ophiuroid *Amphiodia urtica/periercta* and the commensal crab *Pinixxa occidentalis* cmplx. *Levinsenia gracilis* was also the dominant taxa at station AKB03. The subdominant taxa found at roughly one-half of the abundance of *Levinsenia gracilis* included *Sigambra nr bassi*, *Pinixxa occidentalis cmplx*, and *Euphilomedes carcharodonta*. At station AKB07, the dominant taxa were *Euphilomedes carcharodonta* and the bivalve *Axinopsida serricata*. Subdominant taxa, which were found at slightly lower abundances than the dominant taxa, included *Amphiodia urtica/periercta*, *Pinixxa occidentalis cmplx*, and *Parvilucina tenuisculpta*. The dominant taxa were essentially unchanged between the upper 10 cm fraction and the entire box core. A greater number of *Pinixxa occidentalis cmplx*. was found in the deeper part of the box core because of its life strategy. A much larger increase in the abundance of the polychaete *Sigambra nr bassi* was observed at station AKB03. It became the second most abundant taxa at that station.

4.6 Comparison of Benthic Communities between the 1989 and 2005 Transect and Benchmark Stations—Entire Box Core Sample

The question arose as to whether the change in methods from processing and analyzing the entire box core to only the top 10 cm fraction caused the significant differences between the 1989 and 2005 data sets. The decision was made to test this question by analyzing the lower portion of the box core samples collected in 2005.

The comparison of the entire box core between the 1989 and 2005 transect stations indicated statistically significant changes in all taxa groups, except for the abundance of annelids and miscellaneous phyla at station AKT01 (Table 28). Statistically significant reductions in arthropod and total abundance of organisms were observed at the transect stations. Conversely, significant increases in the abundance of molluscs and annelids were observed at stations AKT02 and AKT03 in 2005. The comparison between the 1989 benchmark station AKB02 and the three transect stations in 2005 basically showed the same results. Statistically significant reductions in arthropod abundance and significant increases in the abundance of the other taxa groups were observed. The third set of comparisons was conducted between the 1989 benchmark station AKB02 and the three benchmark stations sampled in 2005 (Table 28). These results were similar to the previous comparisons, showing a statistically significant decrease in arthropod abundance and a statistically significant increase in the abundance of miscellaneous phyla, molluscs, and annelids.

The statistical comparison between the 2005 benchmark stations to the 2005 transect stations indicated that there was no change in the statistically significant reductions in the abundance of arthropods at the transect stations. When the 2005 benchmark stations were tested against the 1989 benchmark and transect stations, the results showed that the abundance of arthropods at the 2005 benchmark stations were also significantly reduced from the 1989 stations.

5.0 DATA EVALUATION

5.1 Objective 1—Address Hypothesis No. 6 of the PSDDA Monitoring Framework

Hypothesis No. 6: No significant decrease in the abundance of dominant benthic infaunal species collected down current (transect stations) of the disposal site has occurred due to dredged material disposal.

In accordance with Hypothesis No. 6 of the PSDDA monitoring framework, the Anderson/Ketron benchmark benthic samples collected in 2005 were analyzed to evaluate the reduction in crustacean arthropod abundance observed at the 2005 transect stations relative to the 1989 baseline. The reduction in abundance at the transect stations was statistically significant and greater than 50 percent of baseline (SAIC 2005). The three decision hypotheses to be tested with respect to the benchmark data are described in Section 2.2 and summarized below.

1. If the arithmetic means of the benchmark monitoring and baseline data are not significantly different, then changes observed at offsite areas potentially reflect an impact from dredged material disposal.

2. If the arithmetic means of the benchmark monitoring and baseline data are significantly different, but that difference is less than 50 percent of the difference between the offsite station monitoring and baseline data, then the changes in offsite areas potentially reflect an impact from dredged material disposal.

3. If the arithmetic means of the benchmark monitoring and baseline data are significantly different, but that difference is greater than 50 percent of the difference of the offsite station monitoring and baseline data, then the changes in offsite areas likely reflect regional changes in conditions that are unrelated to dredged material disposal.

For this evaluation, the 2005 benthic data results for the whole box core samples (Section 4.5) were used for comparison to the 1989 benthic results. This comparison showed that the 2005 benchmark arthropod abundance was also significantly reduced when compared to the 1989 benchmark data (Table 28). For the arthropod data, a comparison of the arithmetic means of the benchmark station differences to the transect differences shows that the differences are less than 50 percent for all comparisons (Table 29). Based on strict interpretation, ***Benchmark Hypothesis No. 2 is accepted:*** *The changes observed in offsite areas (benchmark) potentially reflect an impact from dredged material disposal*. However, the benchmark data also showed statistically significant increases in the abundance of the miscellaneous phyla, the Mollusca, and in the Annelida. Significant increases in the abundance of three of four major taxa are not consistent with impacts from dredged material, and more likely reflect regional changes to site conditions.

5.2 Objective 2—Evaluate Seasonality of Arthropod Abundances

To evaluate whether the reduction in arthropod abundance at the Anderson/Ketron site in 2005 was due to seasonal die-off of adults and juvenile recruitment, the archived benthic samples consisting of the 0.5 mm sieve fraction from the top 10 cm were analyzed for the transect and benchmark stations (Section 4.3). The number of juveniles present in the 1.0 mm sieve fraction from the top 10 cm was also evaluated.

The majority of organisms on the 0.5 mm mesh sieve were classified as juveniles at both transect and benchmark stations. At the transect stations, juveniles ranged from 91.4 percent at station AKT03 to 92.7 percent at station AKT01. At the benchmark stations, juveniles ranged from a low of 87.7 percent at station AKB03 to 93.1 percent at station AKB07 (Table 17). However, the results consistently show that the molluscs and annelids contained the highest abundance at the transect and benchmark stations (Tables 11 and 14). High abundance of juvenile arthropods was not observed. At the transect stations, the numerically dominant species on the 0.5 mm sieve were the polychaete *Axinopsida serricata*, unidentifiable bivalves, and the polychaete *Pectinaria californiensis,* and all were classified as juveniles (Table 13). Similar species were numerically dominant at the benchmark stations (Table 16). The number of juveniles in the 1.0 mm sieve fraction was much lower for the transect and benchmark stations, ranging from a total abundance of 13.1 percent at AKB03 to 29.9 percent at AKT02 (Table 9). The abundance of juvenile arthropods was especially low, ranging from 6.8 percent at AKB07 to 1.1 percent at AKT02.

Based on this evaluation, the reduction in arthropod abundance appears unrelated to a seasonal die-off of adults and recruitment of juveniles. The predominant trend at all benchmark and transect stations sampled in 2005 was one of a significant decrease in the abundance of arthropods compared to the 1989 baseline sampling event at the Anderson/Ketron Island disposal site. Significant increases in the abundance of the other major taxa groups were also observed in 2005. Studies have shown that crustacean arthropods tend to be a taxonomic group that is susceptible to environmental change whether the change is anthropogenic or naturally occurring. Since the last survey at the disposal site was sixteen years previous and the benthic community samples were not identified to the lowest taxonomic level, it is not possible to positively determine the cause of the change. The significant reduction in arthropod abundance and the increased abundance of the other major taxa groups at the 2005 transect and benchmark stations suggests that the changes may be a region-wide phenomenon.

6.0 REFERENCES

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TABLES

Table 1. Results of the 2005 Anderson/Ketron PSDDA Monitoring Framework

Question	Hypothesis	Monitored Variable	Interpretive Guideline	Action Taken
No. 1 **Does the deposited dredged material stay on site?**	1. Dredged material remains within the site boundary.	Sediment Vertical Profiling System (SVPS) Onsite and Offsite	Dredged material layer is greater than 3 cm at the perimeter stations? **NO**	
	2. Chemical concentrations do not measurably increase over time due to dredged material disposal at offsite stations.	Sediment Chemistry Offsite	SQS exceeded? **NO** Temporal increases? **NO**[1]	
No. 2 **Are the biological effects conditions for site management [PSDDA-defined Site Condition II] exceeded at the site due to dredged material disposal? (PSDDA 1988b)**	3. Sediment chemical concentrations at the onsite monitoring stations do not exceed the chemical concentrations associated with PSDDA Site Condition II guidelines due to dredged material disposal.	Sediment Chemistry Onsite	Onsite chemical concentrations exceed DMMP maximum levels? **NO**	
	4. Sediment toxicity at the onsite stations does not exceed the PSDDA Site Condition II biological response guidelines due to dredged material disposal.	Sediment Bioassays Onsite	DMMP bioassays exceed guidelines? **NO**	
No. 3 **Are unacceptable adverse effects due to dredged material disposal occurring to biological resources off site?**	5. No significant increase due to dredged material disposal has occurred in the chemical body burden of benthic infauna species collected down current of the disposal site.	Tissue Chemistry Transect	Guideline tissue chemistry values exceeded? **NO**	
	6. No significant decrease due to dredged material disposal has occurred in the abundance of dominant benthic infaunal species collected down current of the disposal site.	Infaunal Community Structure Transect	Abundance of major taxa < ½ baseline macrobenthic infauna abundances? **YES**	Analysis of benchmark benthic samples

1 Although statistical temporal analysis was not conducted, a comparison of the 1989 and 2005 sediment chemistry results shows chemical concentrations to be low in both years, with no apparent increases over time.

Table 2. Summary Statistics for Stations Sampled during the 1989 Survey

Station	AKT01							
Replicate	**1**	**2**	**3**	**4**	**5**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	187	253	343	170	232	1185	237	68.018
Miscellaneous Abundance	9	2	4	2	3	20	4	2.915
Mollusca Abundance	13	15	4	9	15	56	11.2	4.712
Arthropoda Abundance	123	215	169	140	179	826	165.2	35.710
Annelida Abundance	42	21	166	19	35	283	56.6	61.906
Station	**AKT02**							
Replicate	**1**	**2**	**3**	**4**	**5**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	131	256	201	222	219	1029	205.8	46.300
Miscellaneous Abundance	1	2	1	2	1	7	1.4	0.548
Mollusca Abundance	8	13	19	16	18	74	14.8	4.438
Arthropoda Abundance	98	221	153	174	179	825	165	44.850
Annelida Abundance	24	20	28	30	21	123	24.6	4.336
Station	**AKT03**							
Replicate	**1**	**2**	**3**	**4**	**5**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	160	192	125	188	199	864	172.8	30.557
Miscellaneous Abundance	1	1	3	0	2	7	1.4	1.140
Mollusca Abundance	20	13	6	5	11	55	11	6.042
Arthropoda Abundance	104	150	92	155	165	666	133.2	32.859
Annelida Abundance	35	28	24	28	21	136	27.2	5.263
Station	**AKB02**							
Replicate	**1**	**2**	**3**	**4**	**5**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	134	149	134	139	174	730	146	16.808
Miscellaneous Abundance	3	5	4	4	5	21	4.2	0.837
Mollusca Abundance	6	6	5	6	13	36	7.2	3.271
Arthropoda Abundance	76	91	91	92	107	457	91.4	10.968
Annelida Abundance	49	47	34	37	49	216	43.2	7.155

Table 3. 2005 Benthic Community Summary Statistics for Transect Stations

Station	AKT01							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	83	116	86	97	129	511	102.2	19.8
Miscellaneous Abundance	4	4	9	4	6	27	5.4	2.2
Mollusca Abundance	22	70	20	37	51	200	40.0	20.9
Arthropoda Abundance	12	12	9	7	14	54	10.8	2.8
Annelida Abundance	45	30	48	49	58	230	46.0	10.2
Total Number of Taxa	22	26	25	35	28	136	27.2	4.9
Miscellaneous No. of Taxa	3	2	5	3	3	16	3.2	1.1
Mollusca No. of Taxa	4	7	4	10	5	30	6.0	2.5
Arthropoda No. Of Taxa	3	5	4	4	4	20	4.0	0.7
Annelida No. of Taxa	12	12	12	18	16	70	14.0	2.8
Shannon-Wiener Diversity	2.278	2.288	2.598	2.761	2.486	NA	2.48	0.2
Pielou Eveness Index	0.737	0.702	0.807	0.777	0.746	NA	0.75	0.0
Swartz Dominance Index	6	8	14	16	8	NA	10.4	3.9
Station	**AKT02**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	159	91	113	91	87	541	108.2	30.2
Miscellaneous Abundance	11	4	6	11	7	39	7.8	3.1
Mollusca Abundance	57	21	42	33	21	174	34.8	15.2
Arthropoda Abundance	32	12	19	9	10	82	16.4	9.6
Annelida Abundance	59	54	46	38	49	246	49.2	8.0
Total Number of Taxa	31	29	35	32	27	154	30.8	3.0
Miscellaneous No. of Taxa	6	4	3	7	5	25	5.0	1.6
Mollusca No. of Taxa	5	6	6	5	6	28	5.6	0.5
Arthropoda No. Of Taxa	4	4	5	3	3	19	3.8	0.8
Annelida No. of Taxa	16	15	21	17	13	82	16.4	3.0
Shannon-Wiener Diversity	2.802	2.669	2.847	2.930	2.691	NA	2.79	0.1
Pielou Eveness Index	0.816	0.793	0.801	0.845	0.817	NA	0.81	0.0
Swartz Dominance Index	12	11	12	13	9	NA	11.4	1.4
Station	**AKT03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	113	83	95	136	100	527	105.4	20.2
Miscellaneous Abundance	7	5	7	9	12	40	8.0	2.6
Mollusca Abundance	29	22	11	63	14	139	27.8	20.9
Arthropoda Abundance	14	9	31	18	21	93	18.6	8.3
Annelida Abundance	63	47	46	46	53	255	51.0	7.3
Total Number of Taxa	33	34	36	36	37	176	35.2	1.6
Miscellaneous No. of Taxa	5	2	3	5	7	22	4.4	1.9
Mollusca No. of Taxa	4	8	7	7	6	32	6.4	1.5
Arthropoda No. Of Taxa	4	3	5	4	4	20	4.0	0.7
Annelida No. of Taxa	20	21	21	20	20	102	20.4	0.5
Shannon-Wiener Diversity	2.885	3.137	3.223	2.607	3.049	NA	2.98	0.2
Pielou Eveness Index	0.825	0.889	0.899	0.727	0.844	NA	0.84	0.1
Swartz Dominance Index	7	14	16	10	14	NA	12.2	3.2

Table 4. 2005 Biomass Data from Transect Stations (weight in grams)

Station	AKT01							
Replicate	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Total Biomass	2.340	2.227	3.986	3.620	3.096	15.268	3.054	0.772
Miscellaneous Biomass	0.098	0.066	0.093	0.176	0.024	0.457	0.091	0.056
Mollusca Biomass	0.048	0.095	0.095	0.310	0.075	0.623	0.125	0.105
Arthropoda Biomass	0.090	0.023	0.779	0.034	0.091	1.018	0.204	0.323
Annelida Biomass	2.104	2.043	3.019	3.100	2.906	13.171	2.634	0.517
Station	**AKT02**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	3.317	10.110	8.991	1.792	2.435	26.645	5.329	3.911
Miscellaneous Biomass	0.044	8.043	5.197	0.158	0.019	13.461	2.692	3.724
Mollusca Biomass	0.186	0.588	1.652	0.690	0.056	3.172	0.634	0.628
Arthropoda Biomass	0.203	0.193	0.071	0.015	0.058	0.541	0.108	0.085
Annelida Biomass	2.885	1.286	2.071	0.929	2.301	9.473	1.895	0.787
Station	**AKT03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	4.552	5.340	4.886	1.498	4.131	20.408	4.082	1.511
Miscellaneous Biomass	0.712	2.902	0.060	0.063	0.093	3.828	0.766	1.226
Mollusca Biomass	0.067	0.189	0.159	0.170	0.174	0.758	0.152	0.049
Arthropoda Biomass	0.258	0.127	0.582	0.043	0.197	1.208	0.242	0.207
Annelida Biomass	3.515	2.123	4.085	1.223	3.667	14.614	2.923	1.203

Table 5. 2005 Dominant and Subdominant Taxa at Transect Stations

Station	AKT01							
Replicate	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Axinopsida serricata	14	53	8	22	40	137	27.4	18.7
Levinsenia gracilis	31	10	28	26	28	123	24.6	8.4
Parvilucina tenuisculpta	4	8	8	2	5	27	5.4	2.6
Pinnixa occidentalis Cmplx	8	0	1	3	7	19	3.8	3.6
Euphilomedes carcharodonta	3	5	4	0	1	13	2.6	2.1
Protomedeia sp.	1	2	3	2	5	13	2.6	1.5
Glycera nana	3	2	3	1	3	12	2.4	0.9
Praxillella pacifica	2	0	4	2	4	12	2.4	1.7
Pennatulacea	0	1	3	2	3	9	1.8	1.3
Macoma sp.	2	2	0	2	2	8	1.6	0.9
Station	**AKT02**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Axinopsida serricata	35	10	32	24	14	115	23.0	10.9
Levinsenia gracilis	22	30	15	9	23	99	19.8	8.0
Pinnixa occidentalis Cmplx	18	6	7	0	5	36	7.2	6.6
Protomedeia sp.	12	3	5	5	0	25	5.0	4.4
Parvilucina tenuisculpta	8	3	5	5	1	22	4.4	2.6
Macoma sp.	8	4	2	1	2	17	3.4	2.8
Pennatulacea	4	1	4	3	3	15	3.0	1.2
Sigambra nr. *bassi*	4	5	2	0	4	15	3.0	2.0
Nereis procera	4	1	3	3	3	14	2.8	1.1
Euphilomedes carcharodonta	1	0	5	3	4	13	2.6	2.1
Station	**AKT03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	23	13	12	15	24	87	17.4	5.7
Axinopsida serricata	22	8	1	53	1	85	17.0	21.9
Euphilomedes carcharodonta	7	3	10	8	3	31	6.2	3.1
Protomedeia sp.	2	4	9	4	8	27	5.4	3.0
Parvilucina tenuisculpta	4	7	3	4	6	24	4.8	1.6
Pinnixa occidentalis Cmplx	4	2	5	3	8	22	4.4	2.3
Lepidasthenia berkeleyae	3	4	4	3	3	17	3.4	0.5
Spiophanes berkeleyorum	3	6	3	2	1	15	3.0	1.9
Amphiodia urtica/periercta	1	4	3	1	3	12	2.4	1.3
Euphilomedes producta	0	0	6	3	2	11	2.2	2.5

Table 6. 2005 Benthic Community Summary Statistics for Benchmark Stations (top 10 cm, 1.0 mm mesh sieve)

Station	AKB02							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	183	184	213	203	125	908	181.6	298.12
Miscellaneous Abundance	31	16	28	31	18	124	24.8	41.02
Mollusca Abundance	32	23	32	29	17	133	26.6	43.83
Arthropoda Abundance	60	53	52	53	49	267	53.4	87.28
Annelida Abundance	60	92	101	90	41	384	76.8	127.43
Total Number of Taxa	42	38	41	42	31	194	38.8	63.50
Miscellaneous No. of Taxa	5	5	5	4	3	22	4.4	7.23
Mollusca No. of Taxa	10	8	7	9	7	41	8.2	13.44
Arthropoda No. Of Taxa	6	6	7	4	5	28	5.6	9.20
Annelida No. of Taxa	21	19	22	25	16	103	20.6	33.77
Shannon-Wiener Diversity	3.05	2.84	2.86	2.87	2.68	NA	2.9	0.13
Pielou Eveness Index	0.82	0.78	0.77	0.77	0.78	NA	0.8	0.02
Swartz Dominance Index	11.0	10.0	11.0	10.0	9.0	NA	10.2	0.84
Station	**AKB02**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	162	175	169	199	143	848	169.6	277.55
Miscellaneous Abundance	12	16	8	18	10	64	12.8	21.23
Mollusca Abundance	24	15	8	19	9	75	15.0	25.23
Arthropoda Abundance	34	46	53	40	49	222	44.4	72.81
Annelida Abundance	92	98	100	122	75	487	97.4	159.77
Total Number of Taxa	37	39	29	36	37	178	35.6	58.24
Miscellaneous No. of Taxa	5	7	2	5	4	23	4.6	7.69
Mollusca No. of Taxa	8	7	4	5	4	28	5.6	9.29
Arthropoda No. Of Taxa	6	6	3	5	5	25	5.0	8.24
Annelida No. of Taxa	18	19	20	21	24	102	20.4	33.38
Shannon-Wiener Diversity	3.02	2.69	2.45	2.70	2.83	NA	2.7	0.21
Pielou Eveness Index	0.84	0.74	0.73	0.75	0.78	NA	0.8	0.04
Swartz Dominance Index	13.0	10.0	6.0	10.0	10.0	NA	9.8	2.49
Station	**AKB02**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	166	145	167	198	174	850	170.0	278.13
Miscellaneous Abundance	23	16	10	17	29	95	19.0	31.70
Mollusca Abundance	64	42	54	62	62	284	56.8	93.11
Arthropoda Abundance	39	28	34	66	29	196	39.2	65.52
Annelida Abundance	40	59	69	53	54	275	55.0	90.31
Total Number of Taxa	49	41	48	54	48	240	48.0	78.49
Miscellaneous No. of Taxa	5	7	7	7	8	34	6.8	11.15
Mollusca No. of Taxa	15	8	11	17	11	62	12.4	20.50
Arthropoda No. Of Taxa	8	4	4	6	6	28	5.6	9.27
Annelida No. of Taxa	21	22	26	24	23	116	23.2	37.92
Shannon-Wiener Diversity	3.23	3.25	3.29	3.21	3.23	NA	3.2	0.03
Pielou Eveness Index	0.83	0.87	0.85	0.80	0.83	NA	0.8	0.03
Swartz Dominance Index	15.0	16.0	15.0	18.0	16.0	NA	16.0	1.22

Table 7. 2005 Benthic Community Biomass at Benchmark Stations (top 10 cm, 1.0 mm mesh sieve, weight in grams/0.6 m^2)

Station	AKB02							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	8.1406	6.0196	3.6786	5.9749	1.4853	25.30	5.06	2.55
Miscellaneous Biomass	0.3587	0.1372	0.4502	0.3501	0.1275	1.42	0.28	0.14
Mollusca Biomass	0.4991	0.2983	0.1337	0.0850	0.1592	1.18	0.24	0.17
Arthropoda Biomass	0.3184	0.1831	0.1359	0.1520	0.0908	0.88	0.18	0.09
Annelida Biomass	6.9644	5.4010	2.9588	5.3878	1.1078	21.82	4.36	2.32
Station	**AKB03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	3.7569	3.1433	7.1611	2.3679	6.6588	23.09	4.62	2.16
Miscellaneous Biomass	0.2187	0.6423	0.1830	0.0795	0.2441	1.37	0.27	0.22
Mollusca Biomass	0.1189	0.1292	0.1418	0.1722	0.1486	0.71	0.14	0.02
Arthropoda Biomass	0.2047	0.1470	0.3592	0.3346	0.7017	1.75	0.35	0.22
Annelida Biomass	3.2146	2.2248	6.4771	1.7816	5.5644	19.26	3.85	2.07
Station	**AKB07**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	11.114	11.5742	15.2997	6.1447	6.9758	51.11	10.22	3.73
Miscellaneous Biomass	5.9316	8.3798	5.1966	0.8252	2.0605	22.39	4.48	3.04
Mollusca Biomass	1.17	0.7759	1.5056	0.8752	0.6011	4.93	0.99	0.36
Arthropoda Biomass	0.0819	0.1105	0.0634	0.1341	0.0638	0.45	0.09	0.03
Annelida Biomass	3.9305	2.308	8.5341	4.3102	4.2504	23.33	4.67	2.31

Table 8. 2005 Dominant and Subdominant Taxa at Benchmark Stations (top 10 cm, 1.0 mm mesh sieve)

Station	AKB02							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	15	44	51	41	14	165	33.0	17.3
Euphilomedes carcharodonta	24	31	33	37	37	162	32.4	5.4
Amphiodia urtica/periercta	26	10	23	26	15	100	20.0	7.2
Pinnixa occidentalis Cmplx	22	10	7	10	4	53	10.6	6.8
Axinopsida serricata	9	8	14	10	7	48	9.6	2.7
Praxillella pacifica	9	11	7	8	6	41	8.2	1.9
Parvilucina tenuisculpta	11	6	5	8	2	32	6.4	3.4
Euphilomedes producta	9	5	5	5	5	29	5.8	1.8
Glycera nana	5	2	5	3	4	19	3.8	1.3
Rochefortia tumida	4	0	3	3	0	10	2.0	1.9
Station	**AKB03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	35	57	51	66	29	238	47.6	15.4
Euphilomedes carcharodonta	13	19	22	18	30	102	20.4	6.3
Pinnixa occidentalis Cmplx	15	22	29	17	14	97	19.4	6.2
Sigambra nr. bassi	12	4	12	16	9	53	10.6	4.4
Amphiodia urtica/periercta	6	9	7	8	5	35	7.0	1.6
Praxillella pacifica	10	3	3	4	4	24	4.8	2.9
Rochefortia tumida	8	5	0	6	4	23	4.6	3.0
Parvilucina tenuisculpta	4	3	0	5	1	13	2.6	2.1
Lepidasthenia berkeleyae	5	3	0	2	2	12	2.4	1.8
Yoldia seminuda	4	1	0	0	0	5	1.0	1.7
Station	**AKB07**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Euphilomedes carcharodonta	21	17	27	49	19	133	26.6	13.1
Axinopsida serricata	25	21	11	24	32	113	22.6	7.6
Amphiodia urtica/periercta	17	4	4	9	18	52	10.4	6.8
Parvilucina tenuisculpta	11	8	9	6	5	39	7.8	2.4
Pinnixa occidentalis Cmplx	9	8	3	10	4	34	6.8	3.1
Prionospio steenstrupi	8	1	5	4	8	26	5.2	2.9
Astyris gausapata	6	5	11	3	0	25	5.0	4.1
Rochefortia tumida	4	2	11	6	2	25	5.0	3.7
Olivella baetica	5	2	4	3	6	20	4.0	1.6
Diopatra ornata	4	0	1	3	0	8	1.6	1.8

Table 9. 2005 Percent Juveniles Found at Transect Stations (top 10 cm, 1.0 mm mesh sieve)

Station	AKT01						
Replicate	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Mean	Standard Dev
Taxa Group							
Total Abundance	9.6	26.7	17.4	21.6	27.1	20.5	7.3
Miscellaneous Abundance	0.0	25.0	44.4	25.0	66.7	32.2	24.9
Mollusca Abundance	22.7	37.1	35.0	40.5	51.0	37.3	10.2
Arthropoda Abundance	0.0	0.0	0.0	14.3	0.0	2.9	6.4
Annelida Abundance	6.7	13.3	8.3	8.2	8.6	9.0	2.5
Station	**AKT02**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	32.1	20.9	33.6	31.9	31.0	29.9	5.1
Miscellaneous Abundance	54.5	50.0	66.7	27.3	71.4	54.0	17.3
Mollusca Abundance	57.9	42.9	54.8	45.5	42.9	48.8	7.1
Arthropoda Abundance	0.0	0.0	5.3	0.0	0.0	1.1	2.4
Annelida Abundance	20.3	14.8	21.7	28.9	26.5	22.5	5.5
Station	**AKT03**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	29.2	24.1	24.2	18.4	21.8	23.5	4.0
Miscellaneous Abundance	57.1	80.0	71.4	55.6	30.8	59.0	18.8
Mollusca Abundance	41.4	31.8	36.4	20.6	71.4	40.3	19.0
Arthropoda Abundance	0.0	11.1	3.2	0.0	0.0	2.9	4.8
Annelida Abundance	27.0	17.0	28.3	15.2	15.1	20.5	6.5
Station	**AKB02**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	20.7	10.9	16.9	16.7	25.6	18.2	5.4
Miscellaneous Abundance	54.8	43.8	50.0	51.6	72.2	54.5	10.7
Mollusca Abundance	25.0	26.1	31.3	31.0	23.5	27.4	3.6
Arthropoda Abundance	6.7	1.9	0.0	3.8	2.0	2.9	2.5
Annelida Abundance	14.8	6.5	11.9	7.8	34.1	15.0	11.2
Station	**AKB03**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	14.8	16.6	12.4	14.6	7.0	13.1	3.7
Miscellaneous Abundance	25.0	31.3	62.5	27.8	10.0	31.3	19.2
Mollusca Abundance	33.3	26.7	25.0	21.1	22.2	25.7	4.8
Arthropoda Abundance	2.9	13.0	5.7	7.5	4.1	6.6	4.0
Annelida Abundance	13.0	14.3	11.0	13.9	6.7	11.8	3.1
Station	**AKB07**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	19.6	13.1	13.1	12.1	21.3	15.8	4.3
Miscellaneous Abundance	25.0	18.8	9.1	29.4	24.1	21.3	7.8
Mollusca Abundance	29.7	19.0	20.4	21.0	32.3	24.5	6.0
Arthropoda Abundance	12.5	7.1	5.9	1.5	6.9	6.8	3.9
Annelida Abundance	7.5	10.2	11.6	9.4	14.8	10.7	2.7

Table 10. 2005 Percent Juveniles Among Dominant and Subdominant Taxa at Transect Stations (top 10 cm, 1.0 mm mesh sieve)

Station	AKT01												
Replicate	Rep. A		Rep. B		Rep. C		Rep. D		Rep. E		Pooled Abun	Mean % Juv	Standard Dev
	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv			
Axinopsida serricata	14	0	53	30	8	50	22	41	40	48	137	33.7	20.3
Levinsenia gracilis	31	0	10	0	28	0	26	0	28	0	123	0.0	0.0
Parvilucina tenuisculpta	4	75	8	50	8	38	2	100	5	100	27	72.5	28.5
Pinnixa occidentalis Cmplx	8	0	0	0	1	0	3	0	7	0	19	0.0	0.0
Euphilomedes carcharodonta	3	0	5	0	4	0	0	0	1	0	13	0.0	0.0
Protomedeia sp.	1	0	2	0	3	0	2	0	5	0	13	0.0	0.0
Glycera nana	3	100	2	100	3	67	1	100	3	33	12	80.0	29.8
Praxillella pacifica	2	0	0	0	4	0	2	0	4	0	12	0.0	0.0
Pennatulacea	0	0	1	100	3	100	2	50	3	100	9	70.0	44.7
Macoma sp.	2	100	2	100	0	0	2	100	2	100	8	80.0	44.7
Station	**AKT02**												
Replicate	**Rep. A**		**Rep. B**		**Rep. C**		**Rep. D**		**Rep. E**		**Pooled Abun**	**Mean % Juv**	**Standard Dev**
	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv			
Axinopsida serricata	35	57	10	40	32	50	24	42	14	43	115	46.3	7.1
Levinsenia gracilis	22	0	30	0	15	0	9	0	23	0	99	0.0	0.0
Pinnixa occidentalis Cmplx	18	0	6	0	7	14	0	0	5	0	36	2.9	6.4
Protomedeia sp.	12	0	3	0	5	0	5	0	0	0	25	0.0	0.0
Parvilucina tenuisculpta	8	63	3	33	5	80	5	80	1	100	22	71.2	25.0
Macoma sp.	8	100	4	100	2	100	1	100	2	100	17	100.0	0.0
Pennatulacea	4	100	1	100	4	100	3	100	3	100	15	100.0	0.0
Sigambra nr. *bassi*	4	100	5	40	2	100	0	0	4	50	15	58.0	42.7
Nereis procera	4	100	1	100	3	67	3	100	3	100	14	93.3	14.9
Euphilomedes carcharodonta	1	0	0	0	5	0	3	0	4	0	13	0.0	0.0

Table 10 (continued). 2005 Percent Juveniles Among Dominant and Subdominant Taxa at Transect Stations (top 10 cm, 1.0 mm mesh sieve)

Station	AKT03												
Replicate	Rep. A		Rep. B		Rep. C		Rep. D		Rep. E		Pooled Abun	Mean % Juv	Standard Dev
	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv			
Levinsenia gracilis	23	0	13	0	12	0	15	0	24	0	87	0.0	0.0
Axinopsida serricata	22	41	8	25	1	0	53	15	1	100	85	36.2	38.6
Euphilomedes carcharodonta	7	0	3	0	10	0	8	0	3	0	31	0.0	0.0
Protomedeia sp.	2	0	4	0	9	0	4	0	8	0	27	0.0	0.0
Parvilucina tenuisculpta	4	50	7	29	3	33	4	50	6	67	24	45.7	15.2
Pinnixa occidentalis Cmplx	4	0	2	50	5	20	3	0	8	0	22	14.0	21.9
Lepidasthenia berkeleyae	3	0	4	0	4	0	3	0	3	0	17	0.0	0.0
Spiophanes berkeleyorum	3	0	6	17	3	100	2	0	1	0	15	23.3	43.5
Amphiodia urtica/periercta	1	100	4	100	3	100	1	100	3	67	12	93.3	14.9
Euphilomedes producta	0	0	0	0	6	0	3	0	2	0	11	0.0	0.0

Table 11. 2005 Benthic Community Summary Statistics at Transect Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKT01							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	552	1036	662	599	671	3520	704.0	191.84
Miscellaneous Abundance	10	25	14	16	9	74	14.8	6.38
Mollusca Abundance	323	514	462	348	420	2067	413.4	79.02
Arthropoda Abundance	11	80	18	12	8	129	25.8	30.52
Annelida Abundance	208	417	168	223	234	1250	250.0	96.65
Total Number of Taxa	36	56	37	36	36	201	40.2	8.84
Miscellaneous No. of Taxa	6	8	4	6	6	30	6.0	1.41
Mollusca No. of Taxa	9	12	10	9	8	48	9.6	1.52
Arthropoda No. Of Taxa	7	12	6	5	6	36	7.2	2.77
Annelida No. of Taxa	15	24	17	16	16	88	17.6	3.65
Shannon-Wiener Diversity	2.47	2.73	2.39	2.54	2.34	NA	2.5	0.15
Pielou Eveness Index	0.689	0.677	0.662	0.710	0.654	NA	0.678	0.022
Swartz Dominance Index	6	8	6	7	5	NA	6.4	1.14
Station	**AKT02**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	613	616	890	448	496	3063	612.6	171.50
Miscellaneous Abundance	19	8	14	15	12	68	13.6	4.04
Mollusca Abundance	358	230	398	259	250	1495	299.0	74.24
Arthropoda Abundance	25	148	137	34	17	361	72.2	64.57
Annelida Abundance	211	230	341	140	216	1138	227.6	72.37
Total Number of Taxa	38	34	39	32	35	178	35.6	2.88
Miscellaneous No. of Taxa	5	4	3	5	5	22	4.4	0.89
Mollusca No. of Taxa	9	8	10	9	8	44	8.8	0.84
Arthropoda No. Of Taxa	9	9	10	5	5	38	7.6	2.41
Annelida No. of Taxa	15	13	17	13	17	75	15.0	2.00
Shannon-Wiener Diversity	2.60	2.55	2.61	2.65	2.70	NA	2.6	0.05
Pielou Eveness Index	0.715	0.724	0.712	0.764	0.758	NA	0.735	0.025
Swartz Dominance Index	8	7	7	8	8	NA	7.6	0.55
Station	**AKT03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	419	604	626	647	901	3197	639.4	172.12
Miscellaneous Abundance	22	18	23	14	40	117	23.4	9.94
Mollusca Abundance	198	200	170	186	288	1042	208.4	46.07
Arthropoda Abundance	20	53	37	49	47	206	41.2	13.24
Annelida Abundance	179	333	396	398	526	1832	366.4	126.08
Total Number of Taxa	42	43	44	46	49	224	44.8	2.77
Miscellaneous No. of Taxa	4	4	6	6	8	28	5.6	1.67
Mollusca No. of Taxa	9	8	7	11	12	47	9.4	2.07
Arthropoda No. Of Taxa	8	10	11	10	10	49	9.8	1.10
Annelida No. of Taxa	23	21	21	20	19	104	20.8	1.48
Shannon-Wiener Diversity	2.92	2.74	2.55	2.71	2.63	NA	2.7	0.14
Pielou Eveness Index	0.782	0.729	0.675	0.707	0.675	NA	0.714	0.045
Swartz Dominance Index	10	8	7	7	7	NA	7.8	1.30

Table 12. 2005 Benthic Community Biomass at Transect Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKT01							
Taxa Group	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Total Biomass	0.1243	0.2932	0.1221	0.1323	0.0858	0.758	0.152	0.081
Miscellaneous Biomass	0.0112	0.0080	0.0027	0.0059	0.0013	0.029	0.006	0.004
Mollusca Biomass	0.0491	0.1002	0.0644	0.0470	0.0367	0.297	0.059	0.025
Arthropoda Biomass	0.0020	0.0233	0.0028	0.0039	0.0018	0.034	0.007	0.009
Annelida Biomass	0.0620	0.1617	0.0522	0.0755	0.0460	0.397	0.079	0.047
Station	AKT02							
Taxa Group	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Total Biomass	0.1902	0.2427	0.2500	0.1777	0.2186	1.079	0.216	0.032
Miscellaneous Biomass	0.0064	0.0127	0.0063	0.0177	0.0280	0.071	0.014	0.009
Mollusca Biomass	0.0686	0.0489	0.0799	0.0523	0.0495	0.299	0.060	0.014
Arthropoda Biomass	0.0053	0.0281	0.0257	0.0091	0.0039	0.072	0.014	0.012
Annelida Biomass	0.1099	0.1530	0.1381	0.0986	0.1369	0.637	0.127	0.022
Station	AKT03							
Taxa Group	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Total Biomass	0.1356	0.1779	0.1636	0.1730	0.1962	0.846	0.169	0.022
Miscellaneous Biomass	0.0123	0.0061	0.0449	0.0047	0.0190	0.087	0.017	0.016
Mollusca Biomass	0.0365	0.0310	0.0207	0.0478	0.0308	0.167	0.033	0.010
Arthropoda Biomass	0.0066	0.0131	0.0102	0.0106	0.0130	0.054	0.011	0.003
Annelida Biomass	0.0802	0.1277	0.0878	0.1099	0.1334	0.539	0.108	0.024

Table 13. 2005 Dominant and Subdominant Taxa at Transect Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKT01							
Replicate	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Bivalvia Indet.	96	176	216	118	155	761	152.2	47.4
Axinopsida serricata	129	208	105	128	136	706	141.2	39.1
Pectinaria californiensis	93	115	58	70	128	464	92.8	29.4
Rochefortia tumida	44	52	73	49	56	274	54.8	11.1
Nephtys cornuta	11	90	28	38	21	188	37.6	30.9
Parvilucina tenuisculpta	28	55	27	29	36	175	35.0	11.7
Levinsenia gracilis	44	42	20	28	19	153	30.6	11.9
Cossura spp.	14	37	23	35	22	131	26.2	9.6
Sigambra nr. bassi	16	58	15	17	8	114	22.8	20.0
Nuculoidea	12	9	22	14	26	83	16.6	7.1
Station	**AKT02**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Axinopsida serricata	141	101	170	129	113	654	130.8	26.7
Bivalvia Indet.	129	73	133	51	53	439	87.8	40.4
Pectinaria californiensis	56	67	129	25	51	328	65.6	38.6
Parametopella sp.	1	130	107	7	3	248	49.6	63.5
Rochefortia tumida	32	22	46	39	38	177	35.4	9.0
Nephtys cornuta	16	44	43	22	31	156	31.2	12.4
Sigambra nr. bassi	26	33	32	29	33	153	30.6	3.0
Levinsenia gracilis	36	21	56	9	28	150	30.0	17.6
Parvilucina tenuisculpta	31	26	34	23	27	141	28.2	4.3
Cossura spp.	25	25	24	15	30	119	23.8	5.4
Station	**AKT03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Pectinaria californiensis	40	153	216	180	264	853	170.6	84.0
Axinopsida serricata	71	87	83	77	86	404	80.8	6.7
Levinsenia gracilis	22	51	50	62	96	281	56.2	26.7
Bivalvia Indet.	26	34	23	50	101	234	46.8	32.1
Rochefortia tumida	63	52	34	25	51	225	45.0	15.2
Nephtys cornuta	18	33	27	43	46	167	33.4	11.5
Sigambra nr. bassi	21	19	31	43	47	161	32.2	12.6
Parvilucina tenuisculpta	20	13	18	10	16	77	15.4	4.0
Pholoe glabra	4	21	11	21	19	76	15.2	7.5
Golfingiidae	14	8	18	7	20	67	13.4	5.8

Table 14. 2005 Benthic Community Summary Statistics for Benchmark Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKB02							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	673	689	993	676	776	3807	761.4	136.20
Miscellaneous Abundance	42	49	50	40	47	228	45.6	4.39
Mollusca Abundance	269	213	255	177	215	1129	225.8	36.68
Arthropoda Abundance	100	92	159	82	120	553	110.6	30.44
Annelida Abundance	261	327	519	369	392	1868	373.6	95.33
Total Number of Taxa	53	48	51	52	47	251	50.2	2.59
Miscellaneous No. of Taxa	7	6	5	6	5	29	5.8	0.84
Mollusca No. of Taxa	9	7	6	7	8	37	7.4	1.14
Arthropoda No. Of Taxa	11	14	14	13	9	61	12.2	2.17
Annelida No. of Taxa	26	22	26	25	24	123	24.6	1.67
Shannon-Wiener Diversity	2.78	2.88	2.78	2.71	2.79	NA	2.8	0.06
Pielou Eveness Index	0.700	0.743	0.708	0.687	0.726	NA	0.71	0.02
Swartz Dominance Index	9	9	8	7	8	NA	8.2	0.84
Station	**AKB03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	695	301	829	658	893	3376	675.2	230.11
Miscellaneous Abundance	25	13	31	28	46	143	28.6	11.89
Mollusca Abundance	163	41	146	106	179	635	127.0	55.22
Arthropoda Abundance	43	49	62	53	49	256	51.2	7.01
Annelida Abundance	461	191	573	465	612	2302	460.4	164.51
Total Number of Taxa	51	39	52	49	51	242	48.4	5.37
Miscellaneous No. of Taxa	6	7	4	7	5	29	5.8	1.30
Mollusca No. of Taxa	9	6	9	8	9	41	8.2	1.30
Arthropoda No. Of Taxa	13	10	10	8	8	49	9.8	2.05
Annelida No. of Taxa	22	15	28	25	28	118	23.6	5.41
Shannon-Wiener Diversity	2.55	2.86	2.79	2.71	2.67	NA	2.7	0.12
Pielou Eveness Index	0.649	0.780	0.705	0.696	0.679	NA	0.70	0.05
Swartz Dominance Index	7	9	9	8	7	NA	8	1.00
Station	**AKB07**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	573	564	544	673	781	3135	627.0	99.51
Miscellaneous Abundance	45	38	39	46	64	232	46.4	10.45
Mollusca Abundance	150	168	146	150	197	811	162.2	21.24
Arthropoda Abundance	60	74	69	98	57	358	71.6	16.26
Annelida Abundance	314	279	285	370	451	1699	339.8	71.84
Total Number of Taxa	47	47	55	59	47	255	51.0	5.66
Miscellaneous No. of Taxa	6	6	5	5	7	29	5.8	0.84
Mollusca No. of Taxa	6	8	8	9	7	38	7.6	1.14
Arthropoda No. Of Taxa	13	10	12	16	10	61	12.2	2.49
Annelida No. of Taxa	21	22	29	28	22	122	24.4	3.78
Shannon-Wiener Diversity	2.61	2.90	3.01	2.68	2.54	NA	2.7	0.20
Pielou Eveness Index	0.677	0.754	0.751	0.656	0.660	NA	0.70	0.05
Swartz Dominance Index	8	11	11	8	8	NA	9.2	1.64

Table 15. 2005 Benthic Community Biomass at Benchmark Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKB02							
Taxa Group	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Total Biomass	0.1949	0.1963	0.2742	0.2790	0.2290	1.173	0.235	0.041
Miscellaneous Biomass	0.0216	0.0114	0.0165	0.0218	0.0134	0.085	0.017	0.005
Mollusca Biomass	0.0463	0.0192	0.0283	0.0171	0.0308	0.142	0.028	0.012
Arthropoda Biomass	0.0215	0.0168	0.0334	0.0189	0.0296	0.120	0.024	0.007
Annelida Biomass	0.1054	0.1474	0.1945	0.2198	0.1548	0.822	0.164	0.044
Station	**AKB03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	0.1332	0.0737	0.1743	0.1531	0.1613	0.696	0.139	0.039
Miscellaneous Biomass	0.0203	0.0086	0.0156	0.0186	0.0181	0.081	0.016	0.005
Mollusca Biomass	0.0139	0.0034	0.0077	0.0071	0.0072	0.039	0.008	0.004
Arthropoda Biomass	0.0105	0.0061	0.0150	0.0117	0.0114	0.055	0.011	0.003
Annelida Biomass	0.0874	0.0520	0.1311	0.1136	0.1215	0.506	0.101	0.032
Station	**AKB07**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	0.0997	0.1143	0.1006	0.1008	0.1327	0.548	0.110	0.014
Miscellaneous Biomass	0.0096	0.0236	0.0105	0.0094	0.0189	0.072	0.014	0.006
Mollusca Biomass	0.0156	0.0176	0.0137	0.014	0.0208	0.082	0.016	0.003
Arthropoda Biomass	0.0152	0.0169	0.0163	0.0164	0.0148	0.080	0.016	0.001
Annelida Biomass	0.0582	0.0546	0.0584	0.0592	0.0758	0.306	0.061	0.008

Table 16. 2005 Dominant and Subdominant Taxa at Benchmark Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKB02							
Replicate	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Pooled	Mean	Standard Dev
Axinopsida serricata	196	163	218	149	166	892	178.4	28.0
Pectinaria californiensis	24	96	168	135	119	542	108.4	54.0
Levinsenia gracilis	88	56	121	90	80	435	87.0	23.3
Euphilomedes carcharodonta	44	34	43	47	63	231	46.2	10.6
Pholoe glabra	44	43	48	27	47	209	41.8	8.5
Sigambra nr. bassi	24	30	49	37	26	166	33.2	10.1
Nephtys cornuta	20	36	44	15	43	158	31.6	13.4
Loxoconcha sp.	18	24	50	10	29	131	26.2	15.1
Golfingiidae	13	26	22	17	19	97	19.4	4.9
Parvilucina tenuisculpta	38	18	20	10	8	94	18.8	11.9
Station	**AKB03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Pectinaria californiensis	262	60	225	201	262	1010	202.0	83.5
Bivalvia Indet.	73	12	79	68	85	317	63.4	29.4
Sigambra nr. bassi	25	33	100	70	87	315	63.0	32.9
Levinsenia gracilis	44	32	72	37	53	238	47.6	15.8
Nephtys cornuta	34	12	32	43	80	201	40.2	25.0
Pholoe glabra	39	30	38	42	52	201	40.2	7.9
Axinopsida serricata	46	14	22	13	39	134	26.8	15.0
Euphilomedes carcharodonta	14	13	32	24	24	107	21.4	7.9
Rochefortia tumida	23	10	16	14	34	97	19.4	9.4
Golfingiidae	12	2	23	12	30	79	15.8	10.9
Station	**AKB07**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Pectinaria californiensis	212	144	128	242	312	1038	207.6	75.0
Bivalvia Indet.	48	66	75	54	48	291	58.2	11.9
Axinopsida serricata	42	37	32	57	56	224	44.8	11.3
Rochefortia tumida	34	43	24	18	51	170	34.0	13.5
Golfingiidae	31	25	27	30	45	158	31.6	7.9
Euphilomedes carcharodonta	18	16	29	58	15	136	27.2	18.1
Nephtys cornuta	20	34	21	28	25	128	25.6	5.7
Sigambra nr. bassi	24	18	26	22	17	107	21.4	3.8
Parvilucina tenuisculpta	18	11	5	13	27	74	14.8	8.3
Levinsenia gracilis	7	16	9	11	17	60	12.0	4.4

Table 17. 2005 Percent Juveniles Found at Transect Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKT01						
Replicate	Rep. A	Rep. B	Rep. C	Rep. D	Rep. E	Mean	Standard Dev
Taxa Group							
Total Abundance	93.5	88.8	93.8	90.8	96.4	92.7	2.9
Miscellaneous Abundance	90.0	92.0	85.7	93.8	100.0	92.3	5.2
Mollusca Abundance	100.0	100.0	99.4	100.0	100.0	99.9	0.3
Arthropoda Abundance	81.8	67.5	100.0	75.0	100.0	84.9	14.7
Annelida Abundance	84.1	78.9	78.6	77.1	89.7	81.7	5.2
Station	**AKT02**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	90.0	89.4	93.3	92.2	92.1	91.4	1.6
Miscellaneous Abundance	100.0	75.0	100.0	80.0	84.6	87.9	11.5
Mollusca Abundance	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Arthropoda Abundance	92.0	81.8	89.1	91.2	94.1	89.6	4.8
Annelida Abundance	72.0	84.3	86.8	79.3	83.3	81.2	5.8
Station	**AKT03**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	94.7	92.9	91.1	90.3	91.5	92.1	1.8
Miscellaneous Abundance	100.0	100.0	91.3	92.9	97.5	96.3	4.1
Mollusca Abundance	100.0	100.0	100.0	98.9	100.0	99.8	0.5
Arthropoda Abundance	100.0	92.5	75.7	89.8	78.7	87.3	10.0
Annelida Abundance	87.7	88.3	88.6	86.2	87.5	87.7	0.9
Station	**AKB02**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	87.5	92.3	87.1	89.9	88.9	89.2	2.1
Miscellaneous Abundance	93.0	100.0	83.3	100.0	95.9	94.5	6.9
Mollusca Abundance	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Arthropoda Abundance	81.0	70.7	64.8	85.4	75.0	75.4	8.2
Annelida Abundance	76.2	92.0	88.1	84.8	86.2	85.5	5.8
Station	**AKB03**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	89.8	81.4	88.3	90.6	88.4	87.7	3.6
Miscellaneous Abundance	75.0	35.0	62.5	76.5	86.8	67.2	19.9
Mollusca Abundance	97.5	100.0	100.0	100.0	99.4	99.4	1.1
Arthropoda Abundance	67.4	57.1	87.1	79.2	65.3	71.2	11.9
Annelida Abundance	90.0	88.5	87.6	90.8	87.1	88.8	1.6
Station	**AKB07**						
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Mean**	**Standard Dev**
Total Abundance	95.5	89.7	91.4	94.8	94.4	93.1	2.5
Miscellaneous Abundance	91.8	88.4	88.6	83.6	82.9	87.1	3.7
Mollusca Abundance	100.0	100.0	100.0	100.0	100.0	100.0	0.0
Arthropoda Abundance	86.7	68.9	79.7	86.7	93.0	83.0	9.2
Annelida Abundance	95.5	89.2	90.2	96.5	94.0	93.1	3.2

Table 18. 2005 Percent Juveniles Among Dominant and Subdominant Taxa at Transect Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKT01												
Replicate	Rep. A		Rep. B		Rep. C		Rep. D		Rep. E		Pooled	Mean % Juv	Standard Dev
	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv			
Bivalvia Indet.	96	100	176	100	216	100	118	100	155	100	761	100.0	0.0
Axinopsida serricata	129	100	208	100	105	97	128	100	136	100	706	99.4	1.3
Pectinaria californiensis	93	100	115	100	58	100	70	100	128	100	464	100.0	0.0
Rochefortia tumida	44	100	52	100	73	100	49	10	56	100	274	82.0	40.2
Nephtys cornuta	11	46	90	38	28	57	38	26	21	52	188	43.8	12.2
Parvilucina tenuisculpta	28	100	55	100	27	100	29	100	36	100	175	100.0	0.0
Levinsenia gracilis	44	59	42	62	20	30	28	36	19	53	153	47.9	14.3
Cossura spp.	14	100	37	100	23	87	35	100	22	100	131	97.4	5.9
Sigambra nr. bassi	16	100	58	100	15	100	17	10	8	100	114	82.0	40.2
Nuculoidea	12	100	9	100	22	100	14	10	26	100	83	82.0	40.2
Station	**AKT02**												
Replicate	**Rep. A**		**Rep. B**		**Rep. C**		**Rep. D**		**Rep. E**		**Pooled**	**Mean % Juv**	**STD**
	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv			
Axinopsida serricata	141	100	101	100	170	100	129	100	113	100	654	100.0	0.0
Bivalvia Indet.	129	100	73	100	133	100	51	100	53	100	439	100.0	0.0
Pectinaria californiensis	56	100	67	100	129	100	25	100	51	100	328	100.0	0.0
Parametopella sp.	1	100	130	87	107	88	7	100	3	0	248	74.9	42.4
Rochefortia tumida	32	100	22	100	46	100	39	100	38	100	177	100.0	0.0
Nephtys cornuta	16	75	44	77	43	79	22	59	31	68	156	71.6	8.2
Sigambra nr. bassi	26	100	33	100	32	100	29	100	33	100	153	100.0	0.0
Levinsenia gracilis	36	39	21	52	56	59	9	56	28	68	150	54.7	10.6
Parvilucina tenuisculpta	31	100	26	100	34	100	23	10	27	100	141	82.0	40.2
Cossura spp.	25	32	25	60	24	58	15	53	30	63	119	53.4	12.5

Table 18 (continued). 2005 Percent Juveniles Among Dominant and Subdominant Taxa at Transect Stations (top 10 cm, 0.5 mm mesh sieve)

Station	AKT03												
Replicate	Rep. A		Rep. B		Rep. C		Rep. D		Rep. E		Pooled	Mean % Juv	STD
	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv	Abun	% Juv			
Pectinaria californiensis	40	100	153	100	216	100	180	100	264	100	853	100.0	0.0
Axinopsida serricata	71	100	87	100	83	100	77	100	86	100	404	100.0	0.0
Levinsenia gracilis	22	36	51	67	50	58	62	53	96	62	281	55.2	11.6
Bivalvia Indet.	26	100	34	100	23	100	50	100	101	100	234	100.0	0.0
Rochefortia tumida	63	100	52	100	34	100	25	100	51	100	225	100.0	0.0
Nephtys cornuta	18	94	33	55	27	41	43	49	46	52	167	58.1	20.9
Sigambra nr. bassi	21	100	19	100	31	100	43	100	47	100	161	100.0	0.0
Parvilucina tenuisculpta	20	100	13	100	18	100	10	100	16	100	77	100.0	0.0
Pholoe glabra	4	100	21	95	11	73	21	95	19	100	76	92.6	11.4
Golfingiidae	14	100	8	100	18	100	7	100	20	100	67	100.0	0.0

Table 19. Results of *t*-testing at Transect Stations Comparing Data from the 2005 Benchmark Stations to the 2005 Transect Stations and a Comparison between the 1989 and 2005 Benchmark Stations

Station	2005 AKB02 to 2005 AKT01				2005 AKB02 to 2005 AKT02				2005 AKB02 to 2005 AKT03			
Taxa Group	AK B-02 Mean	AK T-01 Mean	t	P	AK B-02 Mean	AK T-02 Mean	t	P	AK B-02 Mean	AK T-03 Mean	t	P
Total Abundance	181.6	102.2	4.5	<0.05	181.6	108.2	3.6	<0.05	181.6	105.4	4.29	<0.05
Miscellaneous Abundance	24.8	5.4	5.27	<0.05	24.8	7.8	4.81	<0.05	24.8	8	4.86	<0.05
Mollusca Abundance	26.6	40	-1.37	0.11	26.6	34.8	-1.11	0.16	26.6	27.8	-0.12	0.45
Arthropoda Abundance	53.4	10.8	19.44	<0.05	53.4	16.4	7.98	<0.05	53.4	18.6	8.46	<0.05
Annelida Abundance	76.8	46	2.53	<0.05	76.8	49.2	2.33	<0.05	76.8	51	2.19	<0.05
Station	**2005 AKB03 to 2005 AKT01**				**2005 AKB03 to 2005 AKT02**				**2005 AKB03 to 2005 AKT03**			
Taxa Group	**AK B-03 Mean**	**AK T-01 Mean**	**t**	**P**	**AK B-03 Mean**	**AK T-02 Mean**	**t**	**P**	**AK B-03 Mean**	**AK T-03 Mean**	**t**	**P**
Total Abundance	169.6	102.2	5.31	<0.05	169.6	108.2	3.77	<0.05	169.6	105.4	5.00	<0.05
Miscellaneous Abundance	12.8	5.4	3.53	<0.05	12.8	7.8	2.16	<0.05	12.8	8	2.18	<0.05
Mollusca Abundance	15	40	-2.54	<0.05	15	34.8	-2.65	<0.05	15	27.8	-1.30	0.45
Arthropoda Abundance	44.4	10.8	9.39	<0.05	44.4	16.4	5.13	<0.05	44.4	18.6	5.17	<0.05
Annelida Abundance	97.4	46	5.83	<0.05	97.4	49.2	5.77	<0.05	97.4	51	5.63	<0.05
Station	**2005 AKB07 to 2005 AKT01**				**2005 AKB07 to 2005 AKT02**				**2005 AKB07 to 2005 AKT03**			
Taxa Group	**AK B-07 Mean**	**AK T-01 Mean**	**t**	**P**	**AK B-07 Mean**	**AK T-02 Mean**	**t**	**P**	**AK B-07 Mean**	**AK T-03 Mean**	**t**	**P**
Total Abundance	170	102.2	5.52	<0.05	170	108.2	3.87	<0.05	170	105.4	5.20	<0.05
Miscellaneous Abundance	19	5.4	4.02	<0.05	19	7.8	3.18	<0.05	19	8	3.19	<0.05
Mollusca Abundance	56.8	40	1.64	0.08	56.8	34.8	2.77	<0.05	56.8	27.8	2.84	<0.05
Arthropoda Abundance	39.2	10.8	4.01	0.08	39.2	16.4	2.79	<0.05	39.2	18.6	2.60	<0.05
Annelida Abundance	55	46	1.37	0.1	55	49.2	0.98	0.18	55	51	0.70	0.25

Note: Tests were conducted using the upper 10 cm samples. t = Calculated *t*-test value, P = Probability of significant difference. Shaded cells indicate a statistical difference between mean values.

Table 19 (continued). Results of *t*-testing at Transect Stations Comparing Data from the 2005 Benchmark Stations to the 2005 Transect Stations and a Comparison between the 1989 and 2005 Benchmark Stations

Station	1989 AKB02 to 2005 AKB02				1989 AKB02 to 2005 AKB03				1989 AKB02 to 2005 AKB07			
Taxa Group	1989 Mean	2005 Mean	t	P	1989 Mean	2005 Mean	t	P	1989 Mean	2005 Mean	t	P
Total Abundance	146	181.6	-2.09	<0.05	146	169.6	-1.98	<0.05	146	170	-2.11	<0.05
Miscellaneous Abundance	4.2	24.8	-6.3	<0.05	4.2	12.8	-4.54	<0.05	4.2	19	-4.54	<0.05
Mollusca Abundance	7.2	26.6	-5.96	<0.05	7.2	15	-2.33	<0.05	7.2	56.8	-11.44	<0.05
Arthropoda Abundance	91.4	53.4	7.27	<0.05	91.4	44.4	-7.91	<0.05	91.4	39.2	6.12	<0.05
Annelida Abundance	43.2	76.8	-2.86	<0.05	43.2	97.4	-6.60	<0.05	43.2	55	-2.07	<0.05

Note: Tests were conducted using the upper 10 cm samples. t = Calculated *t*-test value, P = Probability of significant difference. Shaded cells indicate a statistical difference between mean values.

Table 20. 2005 Benthic Community Summary Statistics for Transect Stations (combined top 10 cm and greater than 10 cm, 1.0 mm mesh sieve)

Station	AKT01							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	109	148	105	113	143	618	123.6	20.27
Miscellaneous Abundance	4	7	9	4	6	30	6.0	2.12
Mollusca Abundance	28	71	20	37	51	207	41.4	20.16
Arthropoda Abundance	14	14	11	8	17	64	12.8	3.42
Annelida Abundance	63	56	65	64	69	317	63.4	4.72
Total Number of Taxa	32	36	30	40	29	167	33.4	4.56
Miscellaneous No. of Taxa	3	4	5	3	3	18	3.6	0.89
Mollusca No. of Taxa	7	8	4	10	5	34	6.8	2.39
Arthropoda No. Of Taxa	5	6	4	5	4	24	4.8	0.84
Annelida No. of Taxa	17	18	17	22	17	91	18.2	2.17
Shannon-Wiener Diversity	2.68	2.66	2.81	2.97	2.52	NA	2.7	0.17
Pielou Eveness Index	0.77	0.74	0.83	0.81	0.75	NA	0.8	0.04
Swartz Dominance Index	9	10	10	16	8	NA	10.6	3.13
Station	**AKT02**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	199	119	145	112	110	685	137.0	37.37
Miscellaneous Abundance	13	5	10	12	7	47	9.4	3.36
Mollusca Abundance	61	25	42	34	24	186	37.2	15.19
Arthropoda Abundance	36	13	22	10	10	91	18.2	11.10
Annelida Abundance	89	76	71	56	69	361	72.2	11.95
Total Number of Taxa	40	37	41	39	33	190	38.0	3.16
Miscellaneous No. of Taxa	7	4	4	7	5	27	5.4	1.52
Mollusca No. of Taxa	7	7	6	6	8	34	6.8	0.84
Arthropoda No. Of Taxa	5	5	6	4	3	23	4.6	1.14
Annelida No. of Taxa	21	21	25	22	17	106	21.2	2.86
Shannon-Wiener Diversity	3.06	2.98	3.11	3.18	2.85	NA	3.0	0.13
Pielou Eveness Index	0.83	0.82	0.84	0.87	0.82	NA	0.8	0.02
Swartz Dominance Index	12	14	14	16	11	NA	13.4	1.95
Station	**AKT03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	156	112	127	158	130	683	136.6	19.84
Miscellaneous Abundance	11	7	8	10	17	53	10.6	3.91
Mollusca Abundance	33	24	14	68	19	158	31.6	21.52
Arthropoda Abundance	18	13	35	21	26	113	22.6	8.38
Annelida Abundance	94	68	70	59	68	359	71.8	13.12
Total Number of Taxa	39	39	41	41	45	205	41.0	2.45
Miscellaneous No. of Taxa	7	4	3	6	9	29	5.8	2.39
Mollusca No. of Taxa	4	8	7	8	8	35	7.0	1.73
Arthropoda No. Of Taxa	4	4	5	5	5	23	4.6	0.55
Annelida No. of Taxa	24	23	26	22	23	118	23.6	1.52
Shannon-Wiener Diversity	3.06	3.26	3.33	2.86	3.30	NA	3.2	0.20
Pielou Eveness Index	0.83	0.89	0.90	0.77	0.87	NA	0.9	0.05
Swartz Dominance Index	12	14	16	13	18	NA	14.6	2.41

Table 21. Difference in Benthic Community Metrics between Top 10 cm Fraction and Entire Box Core Sample (weight in grams/m^2)

Station	AKT01			
Taxa Group	**Mean Whole Sample**	**Mean Top 10 cm**	**Mean Difference**	**Percent Difference**
Total Abundance	123.6	102.2	21.4	17.3
Miscellaneous Abundance	6.0	5.4	0.6	10.0
Mollusca Abundance	41.4	40.0	1.4	3.4
Arthropoda Abundance	12.8	10.8	2.0	15.6
Annelida Abundance	63.4	46.0	17.4	27.4
Total Number of Taxa	33.4	27.2	6.2	18.6
Miscellaneous No. of Taxa	3.6	3.2	0.4	11.1
Mollusca No. of Taxa	6.8	6.0	0.8	11.8
Arthropoda No. Of Taxa	4.8	4.0	0.8	16.7
Annelida No. of Taxa	18.2	14.0	4.2	23.1
Shannon-Wiener Diversity	2.73	2.48	0.2	9.0
Pielou Eveness Index	0.779	0.754	0.0	3.2
Swartz Dominance Index	10.6	10.4	0.2	1.9
Station	**AKT02**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Mean Difference**	**Percent difference**
Total Abundance	137.0	108.2	28.8	21.0
Miscellaneous Abundance	9.4	7.8	1.6	17.0
Mollusca Abundance	37.2	34.8	2.4	6.5
Arthropoda Abundance	18.2	16.4	1.8	9.9
Annelida Abundance	72.2	49.2	23.0	31.9
Total Number of Taxa	38.0	30.8	7.2	18.9
Miscellaneous No. of Taxa	5.4	5.0	0.4	7.4
Mollusca No. of Taxa	6.8	5.6	1.2	17.6
Arthropoda No. Of Taxa	4.6	3.8	0.8	17.4
Annelida No. of Taxa	21.2	16.4	4.8	22.6
Shannon-Wiener Diversity	3.04	2.79	0.2	8.2
Pielou Eveness Index	0.835	0.814	0.0	2.5
Swartz Dominance Index	13.4	11.4	2.0	14.9
Station	**AKT03**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Mean Difference**	**Percent difference**
Total Abundance	136.6	105.4	31.2	22.8
Miscellaneous Abundance	10.6	8.0	2.6	24.5
Mollusca Abundance	31.6	27.8	3.8	12.0
Arthropoda Abundance	22.6	18.6	4.0	17.7
Annelida Abundance	71.8	51.0	20.8	29.0
Total Number of Taxa	41.0	35.2	5.8	14.1
Miscellaneous No. of Taxa	5.8	4.4	1.4	24.1
Mollusca No. of Taxa	7.0	6.4	0.6	8.6
Arthropoda No. Of Taxa	4.6	4.0	0.6	13.0
Annelida No. of Taxa	23.6	20.4	3.2	13.6
Shannon-Wiener Diversity	3.16	2.98	0.2	5.7
Pielou Eveness Index	0.852	0.837	0.0	1.7
Swartz Dominance Index	14.6	12.2	2.4	16.4

Table 22. 2005 Benthic Community Biomass at Transect and Benchmark Stations (combined top 10 cm and greater than 10 cm, 1.0 mm mesh sieve)

Station	AKT01							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	66.772	14.944	11.400	10.712	11.337	115.165	23.0	24.5
Miscellaneous Biomass	0.098	6.029	0.093	0.176	0.193	6.588	1.3	2.6
Mollusca Biomass	57.213	0.141	0.095	0.310	0.204	57.963	11.6	25.5
Arthropoda Biomass	3.169	0.028	0.903	0.063	0.091	4.254	0.9	1.3
Annelida Biomass	5.293	6.746	7.309	6.163	5.849	31.360	6.3	0.8
Station	**AKT02**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	16.485	36.870	32.952	20.709	18.037	125.053	25.0	9.3
Miscellaneous Biomass	0.391	17.004	19.775	3.901	0.019	41.090	8.2	9.5
Mollusca Biomass	0.200	0.640	1.653	0.690	5.007	8.189	1.6	2.0
Arthropoda Biomass	3.354	0.240	0.190	5.910	0.058	9.752	2.0	2.6
Annelida Biomass	11.540	16.987	8.335	6.209	7.952	51.022	10.2	4.3
Station	**AKT03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Biomass	22.333	21.323	16.732	30.785	14.894	106.066	21.2	6.2
Miscellaneous Biomass	11.791	2.941	0.092	11.410	1.816	28.051	5.6	5.6
Mollusca Biomass	0.113	2.362	0.198	3.934	1.290	7.897	1.6	1.6
Arthropoda Biomass	0.272	0.234	0.821	6.932	0.570	8.827	1.8	2.9
Annelida Biomass	9.157	13.786	12.622	4.509	6.218	46.290	9.3	4.0
Station	**AKB02**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev.**
Total Biomass	11.548	10.178	8.416	14.085	163.522	207.748	41.5	68.2
Miscellaneous Biomass	0.506	0.782	0.450	0.350	0.204	2.292	0.5	0.2
Mollusca Biomass	0.892	0.505	0.355	0.085	0.628	2.465	0.5	0.3
Arthropoda Biomass	0.499	0.254	0.201	0.281	0.144	1.380	0.3	0.1
Annelida Biomass	8.651	6.637	4.409	9.369	157.546	186.612	37.3	67.2
Station	**AKB03**							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev.**
Total Biomass	12.165	15.372	58.321	18.583	23.530	127.972	25.6	18.8
Miscellaneous Biomass	3.190	6.448	5.247	5.687	5.989	26.561	5.3	1.3
Mollusca Biomass	1.364	0.187	38.031	2.323	2.453	44.358	8.9	16.3
Arthropoda Biomass	0.331	0.178	0.534	0.489	0.847	2.379	0.5	0.3
Annelida Biomass	6.280	6.559	11.509	6.085	9.241	39.674	7.9	2.4

Table 22 (continued). 2005 Benthic Community Biomass at Transect and Benchmark Stations (combined top 10 cm and greater than 10 cm, 1.0 mm mesh sieve)

Station	AKB07							
Taxa Group	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev.**
Total Biomass	29.899	46.893	21.118	15.917	20.987	134.813	27.0	12.2
Miscellaneous Biomass	8.292	11.355	6.228	3.443	3.891	33.209	6.6	3.3
Mollusca Biomass	1.642	29.001	2.180	0.942	1.769	35.533	7.1	12.2
Arthropoda Biomass	0.197	0.164	1.176	0.153	0.168	1.858	0.4	0.4
Annelida Biomass	18.768	4.374	8.534	7.379	10.159	49.214	9.8	5.4

Table 23. Difference in Biomass between Top 10 cm Fraction and Entire Box Core Sample (weight in grams/m²)

Station	AKT01			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Difference in grams**	**Percent difference**
Total Biomass	23.03	3.0536	19.98	86.742
Miscellaneous Biomass	1.32	0.0913	1.23	93.071
Mollusca Biomass	11.59	0.1245	11.47	98.926
Arthropoda Biomass	0.85	0.2035	0.65	76.078
Annelida Biomass	6.27	2.6343	3.64	57.999
Station	**AKT02**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Difference in grams**	**Percent difference**
Total Biomass	25.01	5.3291	19.68	78.693
Miscellaneous Biomass	8.22	2.6921	5.53	67.241
Mollusca Biomass	1.64	0.6343	1.00	61.271
Arthropoda Biomass	1.95	0.1082	1.84	94.455
Annelida Biomass	10.20	1.8945	8.31	81.435
Station	**AKT03**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Difference in grams**	**Percent difference**
Total Biomass	21.21	4.0815	17.13	80.760
Miscellaneous Biomass	5.61	0.7656	4.84	86.354
Mollusca Biomass	1.58	0.1516	1.43	90.404
Arthropoda Biomass	1.77	0.2416	1.52	86.315
Annelida Biomass	9.26	2.9228	6.34	68.430
Station	**AKB02**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Difference in grams**	**Percent difference**
Total Biomass	41.55	5.0598	36.49	87.822
Miscellaneous Biomass	0.46	0.2847	0.17	37.870
Mollusca Biomass	0.49	0.2351	0.26	52.322
Arthropoda Biomass	0.28	0.1760	0.10	36.194
Annelida Biomass	37.32	4.3640	32.96	88.307
Station	**AKB03**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Difference in grams**	**Percent difference**
Total Biomass	25.59	4.6176	20.98	81.959
Miscellaneous Biomass	5.31	0.2735	5.04	94.851
Mollusca Biomass	8.87	0.1421	8.73	98.398
Arthropoda Biomass	0.48	0.3494	0.13	26.548
Annelida Biomass	7.93	3.8525	4.08	51.448

Table 23 (continued). Difference in Biomass between Top 10 cm Fraction and Entire Box Core Sample (weight in grams/m²)

Station	AKB07			
Taxa Group	Mean Whole sample	Mean Top 10 cm	Difference in grams	Percent difference
Total Biomass	26.96	10.2217	16.74	62.089
Miscellaneous Biomass	6.64	4.4787	2.16	32.566
Mollusca Biomass	7.11	0.9856	6.12	86.132
Arthropoda Biomass	0.37	0.0907	0.28	75.575
Annelida Biomass	9.84	4.6666	5.18	52.588

Table 24. 2005 Dominant and Subdominant Taxa at Transect Stations (combined top 10 cm and greater than 10 cm, 1.0 mm mesh sieve)

Station	AKT01							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	35	19	29	27	32	142	28.4	6.1
Axinopsida serricata	14	53	8	22	40	137	27.4	18.7
Parvilucina tenuisculpta	4	8	8	2	5	27	5.4	2.6
Praxillella pacifica	4	4	5	5	7	25	5.0	1.2
Pinnixa occidentalis Cmplx	8	0	3	3	10	24	4.8	4.1
Sigambra nr. bassi	7	5	8	3	0	23	4.6	3.2
Lepidasthenia berkeleyae	2	3	6	4	6	21	4.2	1.8
Glycera nana	3	2	3	2	3	13	2.6	0.5
Protomedeia sp.	0	3	3	2	5	13	2.6	1.8
Euphilomedes carcharodonta	3	5	4	0	0	12	2.4	2.3
Station	**AKT02**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Axinopsida serricata	35	10	32	24	14	115	23.0	10.9
Levinsenia gracilis	26	32	17	9	29	113	22.6	9.4
Pinnixa occidentalis Cmplx	21	6	9	0	5	41	8.2	7.9
Lepidasthenia berkeleyae	8	9	5	5	7	34	6.8	1.8
Sigambra nr. bassi	9	6	8	1	5	29	5.8	3.1
Praxillella pacifica	7	5	4	6	4	26	5.2	1.3
Protomedeia sp.	12	3	5	5	0	25	5.0	4.4
Parvilucina tenuisculpta	8	3	5	5	1	22	4.4	2.6
Macoma sp.	9	4	2	1	2	18	3.6	3.2
Nereis procera	4	2	3	3	4	16	3.2	0.8
Station	**AKT03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	24	15	15	15	25	94	18.8	5.2
Axinopsida serricata	22	8	1	53	1	85	17.0	21.9
Pinnixa occidentalis Cmplx	8	5	9	4	11	37	7.4	2.9
Praxillella pacifica	10	9	8	4	6	37	7.4	2.4
Euphilomedes carcharodonta	7	3	10	9	3	32	6.4	3.3
Sigambra nr. bassi	17	4	2	5	3	31	6.2	6.1
Lepidasthenia berkeleyae	7	6	7	6	4	30	6.0	1.2
Protomedeia sp.	2	4	9	4	8	27	5.4	3.0
Parvilucina tenuisculpta	5	7	3	4	7	26	5.2	1.8
Spiophanes berkeleyorum	3	7	3	2	1	16	3.2	2.3

Table 25. 2005 Benthic Community Summary Statistics for Benchmark Stations (combined top 10 cm and greater than 10 cm, 1.0 mm mesh sieve)

Station	AKB02							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	220	207	241	225	155	1048	209.6	32.86
Miscellaneous Abundance	35	18	28	31	22	134	26.8	6.83
Mollusca Abundance	34	26	35	29	22	146	29.2	5.45
Arthropoda Abundance	73	56	57	56	54	296	59.2	7.79
Annelida Abundance	78	107	121	109	57	472	94.4	26.21
Total Number of Taxa	48.00	44.00	48.00	49.00	38.00	227	45.4	4.56
Miscellaneous No. of Taxa	6	6	5	4	3	24	4.8	1.30
Mollusca No. of Taxa	10	8	8	9	9	44	8.8	0.84
Arthropoda No. Of Taxa	6	6	8	6	5	31	6.2	1.10
Annelida No. of Taxa	26	24	27	30	21	128	25.6	3.36
Shannon-Wiener Diversity	3.17	3.04	3.02	3.02	2.92	NA	3.0	0.09
Pielou Eveness Index	0.82	0.80	0.78	0.78	0.80	NA	0.80	0.02
Swartz Dominance Index	13	12	11	11	11	NA	11.6	0.89
Station	**AKB03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	222	218	228	277	186	1131	226.2	32.73
Miscellaneous Abundance	15	21	9	20	13	78	15.6	4.98
Mollusca Abundance	28	16	10	21	14	89	17.8	6.94
Arthropoda Abundance	40	50	57	44	54	245	49.0	7.00
Annelida Abundance	139	131	152	192	105	719	143.8	31.95
Total Number of Taxa	45.00	41.00	40.00	43.00	43.00	212	42.4	1.95
Miscellaneous No. of Taxa	7	7	3	6	5	28	5.6	1.67
Mollusca No. of Taxa	9	7	6	6	4	32	6.4	1.82
Arthropoda No. Of Taxa	6	6	4	5	6	27	5.4	0.89
Annelida No. of Taxa	23	21	27	26	28	125	25.0	2.92
Shannon-Wiener Diversity	3.14	2.88	2.76	2.78	3.02	NA	2.9	0.16
Pielou Eveness Index	0.82	0.78	0.75	0.74	0.80	NA	0.8	0.04
Swartz Dominance Index	14	10	8	10	12	NA	10.8	2.28
Station	**AKB07**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Total Abundance	218	174	183	237	251	1063	212.6	33.41
Miscellaneous Abundance	29	19	12	22	41	123	24.6	11.01
Mollusca Abundance	71	45	58	68	69	311	62.2	10.85
Arthropoda Abundance	45	30	37	69	39	220	44.0	14.97
Annelida Abundance	73	80	76	78	102	409	81.8	11.58
Total Number of Taxa	63.00	47.00	52.00	62.00	65.00	289	57.8	7.85
Miscellaneous No. of Taxa	7	7	7	9	9	39	7.8	1.10
Mollusca No. of Taxa	15	9	12	18	14	68	13.6	3.36
Arthropoda No. Of Taxa	9	5	5	7	8	34	6.8	1.79
Annelida No. of Taxa	32	26	28	28	34	148	29.6	3.29
Shannon-Wiener Diversity	3.52	3.41	3.37	3.37	3.55	NA	3.4	0.08
Pielou Eveness Index	0.85	0.89	0.85	0.82	0.85	NA	0.9	0.02
Swartz Dominance Index	18	18	16	19	20	NA	18.2	1.48

Table 26. Differences in Benthic Community Metrics between Top 10 cm Fraction and Entire Box Core Sample at Benchmark Stations (per m^2).

Station	AKB02			
Taxa Group	**Mean Whole Sample**	**Mean Top 10 cm**	**Mean Difference**	**Percent Difference**
Total Abundance	209.6	181.6	28.0	13.4
Miscellaneous Abundance	26.8	24.8	2.0	7.5
Mollusca Abundance	29.2	26.6	2.6	8.9
Arthropoda Abundance	59.2	53.4	5.8	9.8
Annelida Abundance	94.4	76.8	17.6	18.6
Total Number of Taxa	45.4	38.8	6.6	14.5
Miscellaneous No. of Taxa	4.8	4.4	0.4	8.3
Mollusca No. of Taxa	8.8	8.2	0.6	6.8
Arthropoda No. Of Taxa	6.2	5.6	0.6	9.7
Annelida No. of Taxa	25.6	20.6	5.0	19.5
Shannon-Wiener Diversity	3.03	2.86	0.2	6.1
Pielou Eveness Index	0.800	0.800	0.0	0.0
Swartz Dominance Index	11.6	10.2	1.4	13.7
Station	**AKB03**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Mean Difference**	**Percent Difference**
Total Abundance	226.2	169.6	56.6	25.0
Miscellaneous Abundance	15.6	12.8	2.8	17.9
Mollusca Abundance	17.8	15.0	2.8	15.7
Arthropoda Abundance	49.0	44.4	4.6	9.4
Annelida Abundance	143.8	97.4	46.4	32.3
Total Number of Taxa	42.4	35.6	6.8	16.0
Miscellaneous No. of Taxa	5.6	4.6	1.0	17.9
Mollusca No. of Taxa	6.4	5.6	0.8	12.5
Arthropoda No. Of Taxa	5.4	5.0	0.4	7.4
Annelida No. of Taxa	25.0	20.4	4.6	18.4
Shannon-Wiener Diversity	2.92	2.74	0.2	6.1
Pielou Eveness Index	0.778	0.767	0.0	1.4
Swartz Dominance Index	10.8	9.8	1.0	9.3
Station	**AKB07**			
Taxa Group	**Mean Whole sample**	**Mean Top 10 cm**	**Mean Difference**	**Percent Difference**
Total Abundance	212.6	170.0	42.6	20.0
Miscellaneous Abundance	24.6	19.0	5.6	22.8
Mollusca Abundance	62.2	56.8	5.4	8.7
Arthropoda Abundance	44.0	39.2	4.8	10.9
Annelida Abundance	81.8	55.0	26.8	32.8
Total Number of Taxa	57.8	48.0	9.8	17.0
Miscellaneous No. of Taxa	7.8	6.8	1.0	12.8
Mollusca No. of Taxa	13.6	12.4	1.2	8.8
Arthropoda No. Of Taxa	6.8	5.6	1.2	17.6
Annelida No. of Taxa	29.6	23.2	6.4	21.6
Shannon-Wiener Diversity	3.44	3.24	0.2	5.9
Pielou Eveness Index	0.851	0.839	0.1	1.5
Swartz Dominance Index	18.2	16	2.2	12.1

Table 27. 2005 Dominant and Subdominant Taxa at Benchmark Stations (combined top 10 cm and greater than 10 cm, 1.0 mm mesh sieve)

Station	AKB02							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	16	44	53	43	17	173	34.6	17.0
Euphilomedes carcharodonta	26	31	33	37	37	164	32.8	4.6
Amphiodia urtica/periercta	27	11	23	26	16	103	20.6	6.9
Pinnixa occidentalis Cmplx	32	12	11	10	8	73	14.6	9.8
Praxillella pacifica	10	12	10	9	10	51	10.2	1.1
Axinopsida serricata	9	8	14	10	7	48	9.6	2.7
Sigambra nr. bassi	7	7	13	11	3	41	8.2	3.9
Parvilucina tenuisculpta	11	6	6	8	5	36	7.2	2.4
Euphilomedes producta	9	5	5	5	5	29	5.8	1.8
Lepidasthenia berkeleyae	6	10	3	4	2	25	5.0	3.2
Station	**AKB03**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Levinsenia gracilis	38	58	53	79	30	258	51.6	19.0
Sigambra nr. bassi	31	12	30	45	20	138	27.6	12.5
Pinnixa occidentalis Cmplx	18	26	31	19	18	112	22.4	5.9
Euphilomedes carcharodonta	14	19	23	19	30	105	21.0	6.0
Praxillella pacifica	14	9	7	11	8	49	9.8	2.8
Amphiodia urtica/periercta	6	11	7	9	6	39	7.8	2.2
Lepidasthenia berkeleyae	10	8	8	7	6	39	7.8	1.5
Glycera nana	5	8	8	6	3	30	6.0	2.1
Rochefortia tumida	9	5	1	6	6	27	5.4	2.9
Nereis procera	5	5	9	4	3	26	5.2	2.3
Station	**AKB07**							
Replicate	**Rep. A**	**Rep. B**	**Rep. C**	**Rep. D**	**Rep. E**	**Pooled**	**Mean**	**Standard Dev**
Euphilomedes carcharodonta	21	17	28	49	19	134	26.8	13.1
Axinopsida serricata	25	21	11	26	32	115	23.0	7.8
Amphiodia urtica/periercta	21	5	5	10	24	65	13.0	9.0
Pinnixa occidentalis Cmplx	13	9	4	11	10	47	9.4	3.4
Parvilucina tenuisculpta	14	8	9	6	5	42	8.4	3.5
Dipolydora socialis	5	9	2	14	12	42	8.4	4.9
Levinsenia gracilis	4	13	12	5	7	41	8.2	4.1
Macoma yoldiformis	1	2	32	1	2	38	7.6	13.6
Sigambra nr. bassi	4	9	4	8	7	32	6.4	2.3
Astyris gausapata	7	5	11	4	2	29	5.8	3.4

Table 28. Results of *t*-testing Comparing Data from the 1989 Transect and Benchmark Stations to those Sampled in 2005

Station	1989 AKT01 to 2005 AKT01				1989 AKT02 to 2005 AKT02				1989 AKT03 to 2005 AKT03			
Taxa Group	1989 Mean	2005 Mean	t	P	1989 Mean	2005 Mean	t	P	1989 Mean	2005 Mean	t	P
Total Abundance	237	123.6	3.57	<0.05	205.8	137	2.59	<0.05	172.8	136.6	2.22	<0.05
Miscellaneous Abundance	4	6	-1.24	0.13	1.4	9.4	-5.25	<0.05	1.4	10.6	-5.05	<0.05
Mollusca Abundance	11.2	41.1	-3.26	<0.05	14.8	37.2	-3.17	<0.05	11	31.6	-2.06	<0.05
Arthropoda Abundance	165.2	12.8	9.5	<0.05	165	18.2	7.10	<0.05	133.2	22.6	7.29	<0.05
Annelida Abundance	56.6	63.4	-0.24	0.41	24.6	72.2	-8.37	<0.05	27.2	71.8	-7.05	<0.05
Station	**1989 AKB02 to 2005 AKT01**				**1989 AKB02 to 2005 AKT02**				**1989 AKB02 to 2005 AKT03**			
Taxa Group	**1989 Mean**	**2005 Mean**	**t**	**P**	**1989 Mean**	**2005 Mean**	**t**	**P**	**1989 Mean**	**2005 Mean**	**t**	**P**
Total Abundance	146	123.6	1.9	<0.05	146	137	0.49	0.32	146	136.6	0.81	0.22
Miscellaneous Abundance	4.2	6	-1.77	0.07	4.2	9.4	-3.36	<0.05	4.2	10.6	-3.58	<0.05
Mollusca Abundance	7.2	41.1	-3.74	<0.05	7.2	37.2	-4.32	<0.05	7.2	31.6	-2.51	<0.05
Arthropoda Abundance	91.4	12.8	15.3	<0.05	91.4	18.2	10.50	<0.05	91.4	22.6	11.14	<0.05
Annelida Abundance	43.2	63.4	-5.27	<0.05	43.2	72.2	-4.66	<0.05	43.2	71.8	-4.28	<0.05
Station	**1989 AKB02 to 2005 AKB02**				**1989 AKB02 to 2005 AKB03**				**1989 AKB02 to 2005 AKB07**			
Taxa Group	**1989 Mean**	**2005 Mean**	**t**	**P**	**1989 Mean**	**2005 Mean**	**t**	**P**	**1989 Mean**	**2005 Mean**	**t**	**P**
Total Abundance	146	209.6	-3.85	<0.05	146	226.2	-4.87	<0.05	146	212.6	-3.98	<0.05
Miscellaneous Abundance	4.2	26.8	-7.34	<0.05	4.2	15.6	-5.05	<0.05	4.2	24.6	-4.13	<0.05
Mollusca Abundance	7.2	29.2	-7.74	<0.05	7.2	17.8	-3.09	<0.05	7.2	62.2	-10.85	<0.05
Arthropoda Abundance	91.4	59.2	5.35	<0.05	91.4	49	7.29	<0.05	91.4	44	5.71	<0.05
Annelida Abundance	43.2	94.4	-4.21	<0.05	43.2	143.8	-6.87	<0.05	43.2	81.8	-6.34	<0.05

Note: Tests were conducted using data from the entire grab sample. t = Calculated *t*-test value, P = Probability of significant difference. Shaded cells indicate a statistical difference between mean values. Cells shaded in yellow indicate metrics where the 1989 mean was significantly greater than in 2005, while those in gray indicate the 2005 mean was significantly greater than in 1989.

Table 29. Comparison of the Arithmetic Means of the Benchmark Station Differences to the Transect Station Differences – Arthropod Abundance

Arthropod Abundance Comparison	Arithmetic Mean Difference	1989 AKB02 to 2005 AKB02	1989 AKB02 to 2005 AKB03	1989 AKB02 to 2005 AKB07
		32.2	42.4	47.4
1989 AKT01 to 2005 AKT01	152.4	√	√	√
1989 AKT02 to 2005 AKT02	146.8	√	√	√
1989 AKT03 to 2005 AKT03	110.6	√	√	√

√ = Benchmark arithmetic mean difference is less than 50 percent of transect arithmetic mean difference.

APPENDIX A

BENTHIC INFAUNA ANALYSIS DATA AND QA/QC REPORT

BENTHIC INFAUNA ANALYSIS DATA

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1355	1355	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0112		0.0080		0.0027		0.0059		0.0013		0.0064		0.0127		0.0063	
Mollusca weight (gm)*	juveniles	0.0491		0.1002		0.0644		0.0470		0.0367		0.0686		0.0489		0.0799	
Crustacea weight (gm)*	combined	0.0020		0.0233		0.0028		0.0039		0.0018		0.0053		0.0281		0.0257	
Polychaeta weight (gm)*		0.0620		0.1617		0.0522		0.0755		0.0460		0.1099		0.1530		0.1381	
Oligochaete weight (gm)*		0.0000		0.0000		0.0000		0.0000				0.0000		0.0000		0.0000	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
MISCELLANEOUS																	
Cnidaria																	
Actiniaria	3758						1										
Campanulariidae colony frag.	370401																
Clytia sp. colony fragment	37040105																
Cnidaria Indet.	37																
Edwardsiidae	375901																
Halcampa decemtentaculata	3759040101				1				1				1				
Pachycerianthus fimbriatus	3743010303																
Peachia quinquecapitata	3759040201																
Pennatulacea	3754								1		1						
Stylatula elongata	3754010103																
Virgularia sp.	37540102																
Platyhelminthes																	
Platyhelminthes Indet.	39				1												
Hirudinea																	
Hirudinea Indet.	5012																
Nemertean	43																
Anopla	4301		1					1									
Carinoma mutabilis	4302020102																
Cerebratulus californiensis	4303020208																
Heteronemertea	4303			1		1					1						
Nemertea Indet.	43		3		1	1	1				1			2			2
Palaeonemertea	4302																
Tubulanidae	430201																
Tubulanus nothus	4302010108																
Tubulanus pellucidus	4302010104																
Tubulanus polymorphus	4302010102	1	1		5				4		1		5		1		3
Tubulanus sp.	43020101																
Echinoderm																	
Amphiodia urtica/periercta	8129030199		1		7				2		1		1		2		
Cucumaria piperata	8172060111																
Cucumaria sp.	81720601																
Ophiura sp.	81270106																
Pentamera pseudocalcigera	8172060301																
Pentamera sp.	81720603																
Bryozoa																	
Bowerbankia gracilis frag.	7805010201			1													
Bryozoa colony fragment	78																
Cheilostomata colony fragment	7814																
Ascidiacea																	
Molgula sp.	84060301												1				
Echiura																	
Arhynchite pugettensis	7301020105																
Echiura Indet.	73																
Sipuncula																	
Golfingiidae			3		8		10		7		4		11		3		9

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1355	1355	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0112		0.0080		0.0027		0.0059		0.0013		0.0064		0.0127		0.0063	
Mollusca weight (gm)*	juveniles	0.0491		0.1002		0.0644		0.0470		0.0367		0.0686		0.0489		0.0799	
Crustacea weight (gm)*	combined	0.0020		0.0233		0.0028		0.0039		0.0018		0.0053		0.0281		0.0257	
Polychaeta weight (gm)*		0.0620		0.1617		0.0522		0.0755		0.0460		0.1099		0.1530		0.1381	
Oligochaete weight (gm)*		0.0000		0.0000		0.0000		0.0000				0.0000		0.0000		0.0000	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Phascolosoma agassizi	72000020180																
Thysanocardia nigra	7200020169																
Oligochaeta																	
Oligochaeta Indet.	5003																
MOLLUSCA																	
Aplacophora																	
Chaetoderma argenteum	5402010108																
Chaetoderma sp.	54020101				1		5		3		1		4				2
Gastropoda																	
Astyris gausapata	51050311																
Cephalaspidea Indet.	5110																
Cylichna attonsa	5110040205																
Cylichna sp.	51100402																
Epitonium sp.	51035001																
Gastropoda	51				1												
Haminoea sp.	51101201														1		
Haminoea vesicula	5110120101																
Margarites pupillus	5102100308																
Muricidae Indet.	510501																
Nassarius mendicus	5105080101																
Odostomia sp.	51080101		3		2		1		1						1		
Olivella baetica	5105100102																
Trichotropis cancellata	4103620204																
Turbonilla sp.	51080102		2		2		5						2		1		4
Bivalvia																	
Axinopsida serricata	5515020201		129		208	3	102		128		136		141		101		170
Bivalvia Indet.	55		96		176		216		118		155		129		73		133
Chlamys hastata	5509050101																
Compsomyax subdiaphana	5515470301																
Lucinoma annulatum	5515010201				4		1		2		1		1				2
Lyonsia californica	5520050202		2														1
Mactridae	551525																
Macoma calcarea	5515310101																
Macoma carlottensis	5515310112																
Macoma nasuta	5515310114																
Macoma spp.	55153101		7		3		7		4		9		1				5
Macoma yoldiformis	5515310111																
Modiolus sp.	55070106																
Nuculoidea	5502		12		9		22		14		26		17		5		1
Pandora bilirata	5520020103																
Parvilucina tenuisculpta	5515010101		28		55		27		29		36		31		26		34
Rochefortia tumida	5515100102		44		52		73		49		56		32		22		46
Solamen columbianum	5507010301																
Tellina sp.	55153102				1												
Tresus sp.	55152502																
Yoldia seminuda	5502040505																
Nudibranch																	

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1355	1355	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0112		0.0080		0.0027		0.0059		0.0013		0.0064		0.0127		0.0063	
Mollusca weight (gm)*	juveniles	0.0491		0.1002		0.0644		0.0470		0.0367		0.0686		0.0489		0.0799	
Crustacea weight (gm)*	combined	0.0020		0.0233		0.0028		0.0039		0.0018		0.0053		0.0281		0.0257	
Polychaeta weight (gm)*		0.0620		0.1617		0.0522		0.0755		0.0460		0.1099		0.1530		0.1381	
Oligochaete weight (gm)*		0.0000		0.0000		0.0000		0.0000				0.0000		0.0000		0.0000	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Corambe sp.	51310701																
Nudibranchia Indet.	5515310114																
Crustacea																	
Americhelidium shoemakeri	6169371402																
Ampelisca agassizi	6169020111																
Aoroides sp.	61690616			2	6												
Axiopsis spinulicauda	6183020402																
Brachyura zoea	6184																
Cancer sp.	61880301																
Caprellidae	617101				1												
Cirripedia cypris	6130																
Cirripedia nauplii	6130				6		1				1				2		2
Corycaeus anglicus	6120040101																
Cumella sp.	61540801																
Cylindroleberidae	611103																
Decapoda Indet. (zoea)	6175		1		3						1		1				2
Eobrolgus chumashi	6169421902																
Eudorella pacifica	6154040202								1					1		1	
Eudorellopsis longirostris	6154040306																
Euphilomedes carcharodonta	6111070301		1				4				1		3		1		3
Euphilomedes producta	6111070303				1		4				1		5	1	2		6
Gammaropsis thompsoni	6169260401																
Haliophasma geminatum	6160011601																
Harpacticoida	6119			2													
Heterophoxus affinis	6169420389			1	2				2						2		
Hippolytidae	617916																
Leptognathia gracilis	6157090102																
Leucon sp.	61540401			1													
Loxoconcha sp.	61131901	1		1								2				1	
Lysianassidae	616934																
Neotrypaea californiensis	6183040204																
Ostracoda	6110		2														
Pachynus cf. barnardi	6169343101		3		1		2		1				1	1			1
Parametopella sp.	61694807			1	5		2	2	2		1		1	17	113	13	94
Photis brevipes	6169260210																
Photis lacia	6169260211																
Photis sp.	61692602																
Phoxocephalidae	616942		1														
Pinnixa occidentalis Cmplx	6189060403																
Pinnixa sp.	61890604																
Pinnotheridae	618906												1				
Pleurogonium sp.	61632302																
Podoceropsis angustimana	1692605??																
Poecillostomatoida	6120													7			2
Prachynella lodo	6169345701																
Protomedeia sp.	61692603	1	1	18	29		5	1	3		3		10		1		12
Rhepoxynius boreovariatus	61694215??																

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1355	1355	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0112		0.0080		0.0027		0.0059		0.0013		0.0064		0.0127		0.0063	
Mollusca weight (gm)*	juveniles	0.0491		0.1002		0.0644		0.0470		0.0367		0.0686		0.0489		0.0799	
Crustacea weight (gm)*	combined	0.0020		0.0233		0.0028		0.0039		0.0018		0.0053		0.0281		0.0257	
Polychaeta weight (gm)*		0.0620		0.1617		0.0522		0.0755		0.0460		0.1099		0.1530		0.1381	
Oligochaete weight (gm)*		0.0000		0.0000		0.0000		0.0000				0.0000		0.0000		0.0000	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Rhepoxynius sp.	61694215												1				
Westwoodilla caecula	6169371502																
Polychaeta																	
Amaeana sp.	50016823																
Amage anops	5001670101																
Ampharete acutifrons	5001670208																
Ampharete finmarchica	5001670214																
Ampharete sp.	50016702																
Aphelochaeta glandaria	50015003																
Aphelochaeta monilaris	5001500301				1												
Aphelochaeta sp.	50015003																
Aphrodita japonica	5001010101																
Aphrodita sp.	50010101																
Aricidea lopezi	5001411302						1										
Aricidea ramosa	5001410289																
Aricidea sp.	50014102					1											
Artacama coniferi	5001681101																
Axiothella sp.	50016308																
Brada villosa	5001540102																
Capitella capitata Cmplx.	5001600101								1								
Caulleriella sp.	50015002																
Chone sp.	50017001																
Cirratulidae	500150																
Cossura pygodactylata	5001520106																
Cossura spp.	50015201		14		37	3	20		35		22	17	8	10	15	10	14
Decamastus gracilis	5001600501																
Diopatra ornata	5001290202																
Dipolydora socialis	5001430402																
Dipolydora sp.	50014304																
Dorvilleidae	500136																
Errano bicirrata	5001310101																
Eteone longa	5001130205																
Eteone spetsbergensis	5001130202																
Eteone sp.	50011302				1												
Euclymeninae Indet.	5001631																
Eumida longicornuta	5001131108		1								2						
Eunoe nr. senta	5001020504																
Exogone spp.	50012307	2		2								1				1	1
Glycera americana	5001270104																
Glycera nana	5001270129		4		10		3		8		5		8		11		10
Glycera robusta	5001270106																
Glycera sp.	50012701																
Glycinde armigera	5001280103			1					1		2				1		1
Goniada brunnea	5001280203																
Harmothoe sp.	50010208																
Hesperonoe sp.	50010217																
Heteromastus filobranchus	5001600203																
Laonice cirrata	5001430201				1												

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1355	1355	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0112		0.0080		0.0027		0.0059		0.0013		0.0064		0.0127		0.0063	
Mollusca weight (gm)*	juveniles	0.0491		0.1002		0.0644		0.0470		0.0367		0.0686		0.0489		0.0799	
Crustacea weight (gm)*	combined	0.0020		0.0233		0.0028		0.0039		0.0018		0.0053		0.0281		0.0257	
Polychaeta weight (gm)*		0.0620		0.1617		0.0522		0.0755		0.0460		0.1099		0.1530		0.1381	
Oligochaete weight (gm)*		0.0000		0.0000		0.0000		0.0000				0.0000		0.0000		0.0000	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Leitoscoloplos pugettensis	5001401601		4		14		2		7		3		4		6		
Lepidasthenia berkeleyae	5001021801			1													
Levinsenia gracilis	5001410801	18	26	16	26	14	6	18	10	9	10	22	14	10	11	23	33
Lumbrineridae Indet.	500131																
Lumbrineris cruzensis	5001310118																
Lumbrineris sp.	50013101																
Magelona longicornis	5001440105																
Magelona sp.	50014401																
Maldane sarsi	5001630301																
Malmgreniella macginieti	50010226??																
Malmgreniella sp.	50010226																
Mediomastus sp.	50016004	2		1		2											
Mesochaetopterus taylori	5001490401																
Nephtys assignis	5001250121																
Nephtys caeca	5001250103																
Nephtys cornuta	5001250104	6	5	56	34	12	16	28	10	10	11	4	12	10	34	9	34
Nephtys ferruginea	5001250111																
Nereis procera	5001240404																
Nereis sp.	50012404		2		1		1				1						1
Notoproctus pacificus	5001630601																
Onuphis iridescens	5001290103																
Parandalia fauveli	5001220802																
Paraprionospio pinnata	5001431701		1		2		1		1						1		2
Pectinaria californiensis	5001660304		93		115		58		70		128		56		67		129
Pectinaria sp.	50016603																
Pholoe glabra	5001060102		6	3	16		4	2	6		10	2	15		10	1	13
Pholoides aspera	5001040202																
Phyllodoce groenlandica	5001130102																
Phyllodoce hartmanae	5001131402																
Phyllodoce sp.	50011314				1				1				1				
Phyllodocidae Indet.	500113																
Phylo felix	5001400401				1						1		1				
Pilargis berkeleyae	5001220301				2												1
Pista agassizi	50016807??																
Pista bansei	50016807??																
Pista sp.	50016807																
Pista wui	50016807??																
Platynereis bicanaliculata	5001240501																
Podarkeopsis glabra	5001211903				1	1			1			1			1		11
Polychaeta (larvae)	5001																
Polycirrus sp.	50016808																
Polydora sp.	50014304																
Polynoidae sp. Indet.	500102			1													
Praxillella pacifica	5001630906																
Praxillella sp.	50016309																
Prionospio jubata																	
Prionospio (Minuspio) lighti	5001430521	4	2			1	3	2	1	2	3	2	4	1	3		5

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1355	1355	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0112		0.0080		0.0027		0.0059		0.0013		0.0064		0.0127		0.0063	
Mollusca weight (gm)*	juveniles	0.0491		0.1002		0.0644		0.0470		0.0367		0.0686		0.0489		0.0799	
Crustacea weight (gm)*	combined	0.0020		0.0233		0.0028		0.0039		0.0018		0.0053		0.0281		0.0257	
Polychaeta weight (gm)*		0.0620		0.1617		0.0522		0.0755		0.0460		0.1099		0.1530		0.1381	
Oligochaete weight (gm)*		0.0000		0.0000		0.0000		0.0000				0.0000		0.0000		0.0000	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Prionospio(Minuspio)multibranchiata	5001433601																1
Prionospio steenstrupi	5001430506																
Proceraea cornuta	5001230101																
Pseudopolydora kempi	5001431501																
Rhodine bitorquata	5001631001																
Sabellidae (damaged)	500170																
Scalibregma californicum	50015701??																
Scoletoma luti	5001310109			6	1	2		1		3	1	10	1	5	1	1	4
Scoloplos sp.	50014003																
Sigambra nr. bassi	5001220204		16		58		15		17		8		26		33		32
Sphaerodoropsis sphaerulifer	5001260202																
Spiochaetopterus costarum	5001490302																
Spionidae	500143																
Spiophanes berkeleyorum	5001431004																
Sthenelais tertiaglabra	5001060305																
Sternaspis fossor	5001590102										1						
Streblosoma pacifica	50016825??																
Syllidae	500123																
Syllis elongata	5001230308																
Tenonia priops	5001022302	1	1	1	7		2		3		2		2				5
Terebellidae (damaged)	500168																
Terebellides sp.	50016901																
Terebellides stroemi	5001690101																
Trochochaeta multisetosa	5001450203																
Typosyllis alternata	5001230501																
Notes:																	
No data-no weights																	
Plankton																	
Calanoida	6118	1		43		31		41		8		60		13		13	
Hyperiid amphipods	617001							2									
Other:																	
Nematoda	47	8		12		15		9		6		6		5		4	

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.0177		0.0280		0.0123		0.0061		0.0449		0.0047		0.0190		0.0216	
Mollusca weight (gm)*	juveniles	0.0523		0.0495		0.0365		0.0310		0.0207		0.0478		0.0308		0.0463	
Crustacea weight (gm)*	combined	0.0091		0.0039		0.0066		0.0131		0.0102		0.0106		0.0130		0.0215	
Polychaeta weight (gm)*		0.0986		0.1369		0.0802		0.1277		0.0878		0.1099		0.1334		0.1054	
Oligochaete weight (gm)*		0.0000		0.0003		0.0000		0.0000				0.0000				0.0001	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
MISCELLANEOUS																	
Cnidaria																	
Actiniaria	3758																
Campanulariidae colony frag.	370401															1	
Clytia sp. colony fragment	37040105																
Cnidaria Indet.	37																
Edwardsiidae	375901																
Halcampa decemtentaculata	3759040101			1											1		
Pachycerianthus fimbriatus	3743010303																
Peachia quinquecapitata	3759040201																
Pennatulacea	3754																
Stylatula elongata	3754010103																
Virgularia sp.	37540102														1		
Platyhelminthes																	
Platyhelminthes Indet.	39		1												1	1	1
Hirudinea																	
Hirudinea Indet.	5012																
Nemertean	43																
Anopla	4301	2											1				
Carinoma mutabilis	4302020102																
Cerebratulus californiensis	4303020208									1							
Heteronemertea	4303	1								1		1			2		1
Nemertea Indet.	43								1		2			1	3		6
Palaeonemertea	4302																
Tubulanidae	430201																
Tubulanus nothus	4302010108																
Tubulanus pellucidus	4302010104																
Tubulanus polymorphus	4302010102		1		3		8		8		1		3		7	1	9
Tubulanus sp.	43020101																
Echinoderm																	
Amphiodia urtica/periercta	8129030199				2				1				2		4		9
Cucumaria piperata	8172060111																
Cucumaria sp.	81720601																
Ophiura sp.	81270106																
Pentamera pseudocalcigera	8172060301																
Pentamera sp.	81720603																
Bryozoa																	
Bowerbankia gracilis frag.	7805010201																
Bryozoa colony fragment	78																
Cheilostomata colony fragment	7814																
Ascidiacea																	
Molgula sp.	84060301																
Echiura																	
Arhynchite pugettensis	7301020105																
Echiura Indet.	73																
Sipuncula																	
Golfingiidae			10		6		14		8		18		7		20		13

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.0177		0.0280		0.0123		0.0061		0.0449		0.0047		0.0190		0.0216	
Mollusca weight (gm)*	juveniles	0.0523		0.0495		0.0365		0.0310		0.0207		0.0478		0.0308		0.0463	
Crustacea weight (gm)*	combined	0.0091		0.0039		0.0066		0.0131		0.0102		0.0106		0.0130		0.0215	
Polychaeta weight (gm)*		0.0986		0.1369		0.0802		0.1277		0.0878		0.1099		0.1334		0.1054	
Oligochaete weight (gm)*		0.0000		0.0003		0.0000		0.0000				0.0000				0.0001	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Phascolosoma agassizi	72000020180																
Thysanocardia nigra	7200020169																
Oligochaeta																	
Oligochaeta Indet.	5003			1													1
MOLLUSCA																	
Aplacophora																	
Chaetoderma argenteum	5402010108											1					
Chaetoderma sp.	54020101												1		1		1
Gastropoda																	
Astyris gausapata	51050311														1		
Cephalaspidea Indet.	5110										1	1			1		1
Cylichna attonsa	5110040205																
Cylichna sp.	51100402																
Epitonium sp.	51035001																
Gastropoda	51																
Haminoea sp.	51101201																
Haminoea vesicula	5110120101																
Margarites pupillus	5102100308																
Muricidae Indet.	510501																
Nassarius mendicus	5105080101																
Odostomia sp.	51080101		1												1		
Olivella baetica	5105100102																
Trichotropis cancellata	4103620204																
Turbonilla sp.	51080102		2				6		1								
Bivalvia																	
Axinopsida serricata	5515020201		129		113		71		87		83		77		86		196
Bivalvia Indet.	55		51		53		26		34		23		50		101		2
Chlamys hastata	5509050101																
Compsomyax subdiaphana	5515470301																
Lucinoma annulatum	5515010201		1		5		1		3		2		1		3		2
Lyonsia californica	5520050202						1						1		1		
Mactridae	551525																
Macoma calcarea	5515310101																
Macoma carlottensis	5515310112																
Macoma nasuta	5515310114																
Macoma spp.	55153101		5		3		5		7		6		9		18		2
Macoma yoldiformis	5515310111																
Modiolus sp.	55070106																
Nuculoidea	5502		8		10		5		3		4		10		8		8
Pandora bilirata	5520020103																
Parvilucina tenuisculpta	5515010101		23		27		20		13		18		10		16		38
Rochefortia tumida	5515100102		39		38		63		52		34		25		51		19
Solamen columbianum	5507010301																1
Tellina sp.	55153102																
Tresus sp.	55152502																
Yoldia seminuda	5502040505																
Nudibranch																	

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																	
Analyzed by Columbia Science (2006)																	
0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.0177		0.0280		0.0123		0.0061		0.0449		0.0047		0.0190		0.0216	
Mollusca weight (gm)*	juveniles	0.0523		0.0495		0.0365		0.0310		0.0207		0.0478		0.0308		0.0463	
Crustacea weight (gm)*	combined	0.0091		0.0039		0.0066		0.0131		0.0102		0.0106		0.0130		0.0215	
Polychaeta weight (gm)*		0.0986		0.1369		0.0802		0.1277		0.0878		0.1099		0.1334		0.1054	
Oligochaete weight (gm)*		0.0000		0.0003		0.0000		0.0000				0.0000				0.0001	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Corambe sp.	51310701				1												
Nudibranchia Indet.	5515310114																
Crustacea																	
Americhelidium shoemakeri	6169371402																
Ampelisca agassizi	6169020111																
Aoroides sp.	61690616								1				1				1
Axiopsis spinulicauda	6183020402																
Brachyura zoea	6184																
Cancer sp.	61880301																
Caprellidae	617101												1				
Cirripedia cypris	6130																
Cirripedia nauplii	6130								2		1		2		2		1
Corycaeus anglicus	6120040101								1								
Cumella sp.	61540801																
Cylindroleberidae	611103																
Decapoda Indet. (zoea)	6175		2						6		3		1				
Eobrolgus chumashi	6169421902																
Eudorella pacifica	6154040202			1							1						
Eudorellopsis longirostris	6154040306						1										
Euphilomedes carcharodonta	6111070301		5				4	1	5	1			5		7		44
Euphilomedes producta	6111070303		5		4		5		2	1	6	1	7		9		21
Gammaropsis thompsoni	6169260401																
Haliophasma geminatum	6160011601																
Harpacticoida	6119									1				1		1	
Heterophoxus affinis	6169420389																1
Hippolytidae	617916																
Leptognathia gracilis	6157090102																6
Leucon sp.	61540401				1					1					1		1
Loxoconcha sp.	61131901							3		3		4		2		18	
Lysianassidae	616934																
Neotrypaea californiensis	6183040204						1										
Ostracoda	6110																
Pachynus cf. barnardi	6169343101						1		5		5		7		4		1
Parametopella sp.	61694807		7		3				20		3		9		2		
Photis brevipes	6169260210																
Photis lacia	6169260211																
Photis sp.	61692602						1										
Phoxocephalidae	616942																
Pinnixa occidentalis Cmplx	6189060403																
Pinnixa sp.	61890604																
Pinnotheridae	618906																
Pleurogonium sp.	61632302																
Podoceropsis angustimana	1692605??																
Poecillostomatoida	6120													2			
Prachynella lodo	6169345701																
Protomedeia sp.	61692603	3	12		8		6		7	2	9		11	5	12		5
Rhepoxynius boreovariatus	61694215??																

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																	
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0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.0177		0.0280		0.0123		0.0061		0.0449		0.0047		0.0190		0.0216	
Mollusca weight (gm)*	juveniles	0.0523		0.0495		0.0365		0.0310		0.0207		0.0478		0.0308		0.0463	
Crustacea weight (gm)*	combined	0.0091		0.0039		0.0066		0.0131		0.0102		0.0106		0.0130		0.0215	
Polychaeta weight (gm)*		0.0986		0.1369		0.0802		0.1277		0.0878		0.1099		0.1334		0.1054	
Oligochaete weight (gm)*		0.0000		0.0003		0.0000		0.0000				0.0000				0.0001	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Rhepoxynius sp.	61694215																
Westwoodilla caecula	6169371502						1										
Polychaeta																	
Amaeana sp.	50016823																
Amage anops	5001670101																
Ampharete acutifrons	5001670208																
Ampharete finmarchica	5001670214																
Ampharete sp.	50016702																
Aphelochaeta glandaria	50015003																
Aphelochaeta monilaris	5001500301								1								
Aphelochaeta sp.	50015003																
Aphrodita japonica	5001010101																
Aphrodita sp.	50010101																
Aricidea lopezi	5001411302																
Aricidea ramosa	5001410289															1	
Aricidea sp.	50014102																
Artacama coniferi	5001681101																
Axiothella sp.	50016308																
Brada villosa	5001540102																
Capitella capitata Cmplx.	5001600101																
Caulleriella sp.	50015002																
Chone sp.	50017001																
Cirratulidae	500150																
Cossura pygodactylata	5001520106																
Cossura spp.	50015201	7	8	11	19		21		9		16		9		11		17
Decamastus gracilis	5001600501																
Diopatra ornata	5001290202																
Dipolydora socialis	5001430402																
Dipolydora sp.	50014304																
Dorvilleidae	500136																
Errano bicirrata	5001310101																
Eteone longa	5001130205																
Eteone spetsbergensis	5001130202																
Eteone sp.	50011302						1										
Euclymeninae Indet.	5001631																1
Eumida longicornuta	5001131108						1										
Eunoe nr. senta	5001020504																
Exogone spp.	50012307	1	1	1		4		1	2	1		1		1		5	
Glycera americana	5001270104																
Glycera nana	5001270129		4		7		14		8		10		9		7		8
Glycera robusta	5001270106																
Glycera sp.	50012701																
Glycinde armigera	5001280103		3		1		1		4		3				2		1
Goniada brunnea	5001280203																
Harmothoe sp.	50010208						1		1								
Hesperonoe sp.	50010217																
Heteromastus filobranchus	5001600203																
Laonice cirrata	5001430201				1												1

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																	
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0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.0177		0.0280		0.0123		0.0061		0.0449		0.0047		0.0190		0.0216	
Mollusca weight (gm)*	juveniles	0.0523		0.0495		0.0365		0.0310		0.0207		0.0478		0.0308		0.0463	
Crustacea weight (gm)*	combined	0.0091		0.0039		0.0066		0.0131		0.0102		0.0106		0.0130		0.0215	
Polychaeta weight (gm)*		0.0986		0.1369		0.0802		0.1277		0.0878		0.1099		0.1334		0.1054	
Oligochaete weight (gm)*		0.0000		0.0003		0.0000		0.0000				0.0000				0.0001	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Leitoscoloplos pugettensis	5001401601	3	10		9		11		15		13		8	1	11		8
Lepidasthenia berkeleyae	5001021801												1				
Levinsenia gracilis	5001410801	4	5	9	19	14	8	17	34	21	29	29	33	37	59	55	33
Lumbrineridae Indet.	500131																
Lumbrineris cruzensis	5001310118																
Lumbrineris sp.	50013101						1						2				
Magelona longicornis	5001440105																
Magelona sp.	50014401										1						
Maldane sarsi	5001630301																
Malmgreniella macginieti	50010226??																
Malmgreniella sp.	50010226																
Mediomastus sp.	50016004				1			1		1				1	1		1
Mesochaetopterus taylori	5001490401																
Nephtys assignis	5001250121																
Nephtys caeca	5001250103																
Nephtys cornuta	5001250104	9	13	10	21	1	17	15	18	16	11	22	21	22	24		20
Nephtys ferruginea	5001250111					1											
Nereis procera	5001240404																
Nereis sp.	50012404				1		1		1		2						1
Notoproctus pacificus	5001630601																
Onuphis iridescens	5001290103																
Parandalia fauveli	5001220802																
Paraprionospio pinnata	5001431701								3				2		1		
Pectinaria californiensis	5001660304		25		51		40		153		216		180		264		24
Pectinaria sp.	50016603																
Pholoe glabra	5001060102	1	10	3	10		4	1	20	3	8	1	20		19		44
Pholoides aspera	5001040202																
Phyllodoce groenlandica	5001130102						1										
Phyllodoce hartmanae	5001131402																
Phyllodoce sp.	50011314																
Phyllodocidae Indet.	500113																
Phylo felix	5001400401												2		1		1
Pilargis berkeleyae	5001220301				1		1		1		1		2		1		2
Pista agassizi	50016807??																
Pista bansei	50016807??																
Pista sp.	50016807																
Pista wui	50016807??																
Platynereis bicanaliculata	5001240501																
Podarkeopsis glabra	5001211903	1		1				1	1		2		4		2		
Polychaeta (larvae)	5001																
Polycirrus sp.	50016808																
Polydora sp.	50014304																
Polynoidae sp. Indet.	500102		1								2						3
Praxillella pacifica	5001630906																
Praxillella sp.	50016309																
Prionospio jubata																	
Prionospio (Minuspio) lighti	5001430521				5		8		2		2				6		1

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																	
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0-10 cm Depth and 0.5mm Sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.0177		0.0280		0.0123		0.0061		0.0449		0.0047		0.0190		0.0216	
Mollusca weight (gm)*	juveniles	0.0523		0.0495		0.0365		0.0310		0.0207		0.0478		0.0308		0.0463	
Crustacea weight (gm)*	combined	0.0091		0.0039		0.0066		0.0131		0.0102		0.0106		0.0130		0.0215	
Polychaeta weight (gm)*		0.0986		0.1369		0.0802		0.1277		0.0878		0.1099		0.1334		0.1054	
Oligochaete weight (gm)*		0.0000		0.0003		0.0000		0.0000				0.0000				0.0001	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Prionospio(Minuspio)multibranchiata	5001433601					1	3	1		1	1	1	1				
Prionospio steenstrupi	5001430506						1				1						
Proceraea cornuta	5001230101																
Pseudopolydora kempi	5001431501																
Rhodine bitorquata	5001631001																
Sabellidae (damaged)	500170																
Scalibregma californicum	50015701??																
Scoletoma luti	5001310109	3	2	1	1			2	1	2	1	1	2	3		1	3
Scoloplos sp.	50014003																
Sigambra nr. bassi	5001220204		29		33		21		19		31		43		47		24
Sphaerodoropsis sphaerulifer	5001260202													1			1
Spiochaetopterus costarum	5001490302												1				
Spionidae	500143																
Spiophanes berkeleyorum	5001431004																1
Sthenelais tertiaglabra	5001060305																
Sternaspis fossor	5001590102																2
Streblosoma pacifica	50016825??																
Syllidae	500123					1											
Syllis elongata	5001230308																
Tenonia priops	5001022302						1		1		1		1		4		
Terebellidae (damaged)	500168																
Terebellides sp.	50016901																1
Terebellides stroemi	5001690101																
Trochochaeta multisetosa	5001450203												2				1
Typosyllis alternata	5001230501																
Notes:																	
No data-no weights																	
Plankton																	
Calanoida	6118	77		4		2		6		35		62		31		20	
Hyperiid amphipods	617001									1							
Other:																	
Nematoda	47	6		6		10		3		4		8		9		4	

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																		
Analyzed by Columbia Science (2006)																		
0-10 cm Depth and 0.5mm Sieve																		
												Fine	**Sand**					
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1132
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.0114		0.0165		0.0218		0.0134		0.0203		0.0086		0.0156		0.0186		0.0181
Mollusca weight (gm)*	juveniles	0.0192		0.0283		0.0171		0.0308		0.0139		0.0034		0.0077		0.0071		0.0072
Crustacea weight (gm)*	combined	0.0168		0.0334		0.0189		0.0296		0.0105		0.0061		0.0150		0.0117		0.0114
Polychaeta weight (gm)*		0.1474		0.1945		0.2198		0.1548		0.0874		0.0520		0.1311		0.1136		0.1215
Oligochaete weight (gm)*		0.0015		0.0015		0.0014		0.0004		0.0011		0.0036		0.0049		0.0021		0.0031
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
MISCELLANEOUS																		
Cnidaria																		
Actiniaria	3758												1					
Campanulariidae colony frag.	370401																	
Clytia sp. colony fragment	37040105																	
Cnidaria Indet.	37																	
Edwardsiidae	375901																	
Halcampa decemtentaculata	3759040101																	
Pachycerianthus fimbriatus	3743010303																	
Peachia quinquecapitata	3759040201																	
Pennatulacea	3754																	
Stylatula elongata	3754010103																	
Virgularia sp.	37540102																	
Platyhelminthes																		
Platyhelminthes Indet.	39		1															
Hirudinea																		
Hirudinea Indet.	5012																	
Nemertean	43																	
Anopla	4301									2						1	1	
Carinoma mutabilis	4302020102																	
Cerebratulus californiensis	4303020208																	
Heteronemertea	4303		1				1			1		1					2	
Nemertea Indet.	43		5		3		1		3		1		4		2	1	1	
Palaeonemertea	4302																	
Tubulanidae	430201																	
Tubulanus nothus	4302010108																	
Tubulanus pellucidus	4302010104						5		1			1					2	
Tubulanus polymorphus	4302010102		8		10		7		8	1	4	3		1	3		3	
Tubulanus sp.	43020101																	
Echinoderm																		
Amphiodia urtica/periercta	8129030199		8	1	13		9		16		4	1			2		5	
Cucumaria piperata	8172060111																	
Cucumaria sp.	81720601																	
Ophiura sp.	81270106																	
Pentamera pseudocalcigera	8172060301																	
Pentamera sp.	81720603																	
Bryozoa																		
Bowerbankia gracilis frag.	7805010201																	
Bryozoa colony fragment	78																	
Cheilostomata colony fragment	7814																	
Ascidiacea																		
Molgula sp.	84060301																	
Echiura																		
Arhynchite pugettensis	7301020105																	
Echiura Indet.	73				1													
Sipuncula																		
Golfingiidae			26		22		17		19		12		2		23		12	

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																		
Analyzed by Columbia Science (2006)																		
0-10 cm Depth and 0.5mm Sieve																		
												Fine	**Sand**					
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1132
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.0114		0.0165		0.0218		0.0134		0.0203		0.0086		0.0156		0.0186		0.0181
Mollusca weight (gm)*	juveniles	0.0192		0.0283		0.0171		0.0308		0.0139		0.0034		0.0077		0.0071		0.0072
Crustacea weight (gm)*	combined	0.0168		0.0334		0.0189		0.0296		0.0105		0.0061		0.0150		0.0117		0.0114
Polychaeta weight (gm)*		0.1474		0.1945		0.2198		0.1548		0.0874		0.0520		0.1311		0.1136		0.1215
Oligochaete weight (gm)*		0.0015		0.0015		0.0014		0.0004		0.0011		0.0036		0.0049		0.0021		0.0031
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Phascolosoma agassizi	72000020180																	
Thysanocardia nigra	7200020169																	
Oligochaeta																		
Oligochaeta Indet.	5003		8	9	1		8	2		3		7		17		6		7
MOLLUSCA																		
Aplacophora																		
Chaetoderma argenteum	5402010108																	
Chaetoderma sp.	54020101										1							
Gastropoda																		
Astyris gausapata	51050311																	
Cephalaspidea Indet.	5110																	
Cylichna attonsa	5110040205																	
Cylichna sp.	51100402																	
Epitonium sp.	51035001																	
Gastropoda	51														1			
Haminoea sp.	51101201																	
Haminoea vesicula	5110120101																	
Margarites pupillus	5102100308																	
Muricidae Indet.	510501																	
Nassarius mendicus	5105080101																	
Odostomia sp.	51080101																	
Olivella baetica	5105100102																	
Trichotropis cancellata	4103620204																	
Turbonilla sp.	51080102								1		3		3		5		2	
Bivalvia																		
Axinopsida serricata	5515020201		163		218		149		166		46		14		22		13	
Bivalvia Indet.	55		7		5				2		73		12		79		68	
Chlamys hastata	5509050101																	
Compsomyax subdiaphana	5515470301																	
Lucinoma annulatum	5515010201		4				1		1									
Lyonsia californica	5520050202						1				3				1		1	
Mactridae	551525																	
Macoma calcarea	5515310101																	
Macoma carlottensis	5515310112																	
Macoma nasuta	5515310114																	
Macoma spp.	55153101		4		1		1		2		5		1		2		2	
Macoma yoldiformis	5515310111																	
Modiolus sp.	55070106																	
Nuculoidea	5502		5		3		5		4		4		1		9		3	
Pandora bilirata	5520020103																	
Parvilucina tenuisculpta	5515010101		18		20		10		8		5				11		3	
Rochefortia tumida	5515100102		12		8		10		31	4	19		10		16		14	1
Solamen columbianum	5507010301																	
Tellina sp.	55153102																	
Tresus sp.	55152502																	
Yoldia seminuda	5502040505																	
Nudibranch																		

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												Fine	**Sand**					
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1132
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.0114		0.0165		0.0218		0.0134		0.0203		0.0086		0.0156		0.0186		0.0181
Mollusca weight (gm)*	juveniles	0.0192		0.0283		0.0171		0.0308		0.0139		0.0034		0.0077		0.0071		0.0072
Crustacea weight (gm)*	combined	0.0168		0.0334		0.0189		0.0296		0.0105		0.0061		0.0150		0.0117		0.0114
Polychaeta weight (gm)*		0.1474		0.1945		0.2198		0.1548		0.0874		0.0520		0.1311		0.1136		0.1215
Oligochaete weight (gm)*		0.0015		0.0015		0.0014		0.0004		0.0011		0.0036		0.0049		0.0021		0.0031
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Corambe sp.	51310701																	
Nudibranchia Indet.	5515310114																	
Crustacea																		
Americhelidium shoemakeri	6169371402																	
Ampelisca agassizi	6169020111																	
Aoroides sp.	61690616						1											
Axiopsis spinulicauda	6183020402																	
Brachyura zoea	6184																	
Cancer sp.	61880301																	
Caprellidae	617101		1				1						1					
Cirripedia cypris	6130												2					
Cirripedia nauplii	6130				3						1				1			
Corycaeus anglicus	6120040101			1									1		1			
Cumella sp.	61540801				1													
Cylindroleberidae	611103	1		2	1					1		1		1	1			
Decapoda Indet. (zoea)	6175												1					
Eobrolgus chumashi	6169421902																	
Eudorella pacifica	6154040202						1				1							
Eudorellopsis longirostris	6154040306																	
Euphilomedes carcharodonta	6111070301		34		43		47		63	1	13		13		32		24	7
Euphilomedes producta	6111070303		17		25		6		13	3	7		9		15	1	10	2
Gammaropsis thompsoni	6169260401																	
Haliophasma geminatum	6160011601						1											
Harpacticoida	6119	1		3				1		4		5		4		5		6
Heterophoxus affinis	6169420389										4						1	
Hippolytidae	617916																	
Leptognathia gracilis	6157090102		1		11		9		6									
Leucon sp.	61540401		1		2		1		1		1				2			
Loxoconcha sp.	61131901	24		50		10		29		2		15		3		1		1
Lysianassidae	616934		2															
Neotrypaea californiensis	6183040204																	
Ostracoda	6110									1								
Pachynus cf. barnardi	6169343101		4		6				3						1			
Parametopella sp.	61694807		1							1	1				1		2	
Photis brevipes	6169260210																	
Photis lacia	6169260211						1		1									
Photis sp.	61692602				1								1					
Phoxocephalidae	616942																	
Pinnixa occidentalis Cmplx	6189060403																	
Pinnixa sp.	61890604																	
Pinnotheridae	618906																	
Pleurogonium sp.	61632302																	
Podoceropsis angustimana	1692605??																	
Poecillostomatoida	6120	1				2				1								
Prachynella lodo	6169345701																	
Protomedeia sp.	61692603		3		9		1		3		1					4	4	1
Rhepoxynius boreovariatus	61694215??																	

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												Fine	**Sand**					
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1132
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.0114		0.0165		0.0218		0.0134		0.0203		0.0086		0.0156		0.0186		0.0181
Mollusca weight (gm)*	juveniles	0.0192		0.0283		0.0171		0.0308		0.0139		0.0034		0.0077		0.0071		0.0072
Crustacea weight (gm)*	combined	0.0168		0.0334		0.0189		0.0296		0.0105		0.0061		0.0150		0.0117		0.0114
Polychaeta weight (gm)*		0.1474		0.1945		0.2198		0.1548		0.0874		0.0520		0.1311		0.1136		0.1215
Oligochaete weight (gm)*		0.0015		0.0015		0.0014		0.0004		0.0011		0.0036		0.0049		0.0021		0.0031
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Rhepoxynius sp.	61694215																	
Westwoodilla caecula	6169371502		1		1		1										1	
Polychaeta																		
Amaeana sp.	50016823																	
Amage anops	5001670101																	
Ampharete acutifrons	5001670208																	
Ampharete finmarchica	5001670214																	
Ampharete sp.	50016702																	
Aphelochaeta glandaria	50015003																	
Aphelochaeta monilaris	5001500301								1									
Aphelochaeta sp.	50015003																	
Aphrodita japonica	5001010101														1			
Aphrodita sp.	50010101																	
Aricidea lopezi	5001411302									1		1					1	1
Aricidea ramosa	5001410289						1								1			
Aricidea sp.	50014102																	
Artacama coniferi	5001681101																	
Axiothella sp.	50016308				5		1											
Brada villosa	5001540102																	
Capitella capitata Cmplx.	5001600101														1	1		
Caulleriella sp.	50015002																	
Chone sp.	50017001																	
Cirratulidae	500150																	
Cossura pygodactylata	5001520106																	
Cossura spp.	50015201		19		16		8		4		17		10		20		13	
Decamastus gracilis	5001600501																	
Diopatra ornata	5001290202																	
Dipolydora socialis	5001430402																	
Dipolydora sp.	50014304																	
Dorvilleidae	500136																	
Errano bicirrata	5001310101																	
Eteone longa	5001130205																	
Eteone spetsbergensis	5001130202																	
Eteone sp.	50011302															1		
Euclymeninae Indet.	5001631								1									
Eumida longicornuta	5001131108		2		1	1	2								1		2	
Eunoe nr. senta	5001020504																	
Exogone spp.	50012307	5		4				1		2		1		8		6		7
Glycera americana	5001270104																	
Glycera nana	5001270129		11		15		9		11		7		6		17		12	
Glycera robusta	5001270106																	
Glycera sp.	50012701																	
Glycinde armigera	5001280103				1		4		2		1		1		1		3	
Goniada brunnea	5001280203																	
Harmothoe sp.	50010208																	
Hesperonoe sp.	50010217																	
Heteromastus filobranchus	5001600203																	
Laonice cirrata	5001430201														1			

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Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1132
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.0114		0.0165		0.0218		0.0134		0.0203		0.0086		0.0156		0.0186		0.0181
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Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Leitoscoloplos pugettensis	5001401601		5		13		7	1	16	1	5		1		9		3	
Lepidasthenia berkeleyae	5001021801										1							
Levinsenia gracilis	5001410801	19	37	54	67	52	38	52	28	20	24	14	18	30	42	12	25	25
Lumbrineridae Indet.	500131													1	1	2		
Lumbrineris cruzensis	5001310118																	
Lumbrineris sp.	50013101																	
Magelona longicornis	5001440105																	
Magelona sp.	50014401																	
Maldane sarsi	5001630301																	
Malmgreniella macginieti	50010226??																	
Malmgreniella sp.	50010226																	
Mediomastus sp.	50016004		2		1	1			4					1		2		1
Mesochaetopterus taylori	5001490401																	
Nephtys assignis	5001250121																	
Nephtys caeca	5001250103																	
Nephtys cornuta	5001250104		36	1	43		15		43	15	19	3	9	12	20	8	35	30
Nephtys ferruginea	5001250111																	
Nereis procera	5001240404																	
Nereis sp.	50012404								1		1				5		2	
Notoproctus pacificus	5001630601																	
Onuphis iridescens	5001290103																	
Parandalia fauveli	5001220802																	
Paraprionospio pinnata	5001431701		2		1						2		1				1	
Pectinaria californiensis	5001660304		96		168		135		119		262		60		225		201	
Pectinaria sp.	50016603																	
Pholoe glabra	5001060102	1	42		48		27		47	3	36	2	28	4	34	1	41	5
Pholoides aspera	5001040202																	
Phyllodoce groenlandica	5001130102		1				1								1			
Phyllodoce hartmanae	5001131402																	
Phyllodoce sp.	50011314										2						1	
Phyllodocidae Indet.	500113						4		3									
Phylo felix	5001400401		2				1		9						1			
Pilargis berkeleyae	5001220301		1		1		1										1	
Pista agassizi	50016807??																	
Pista bansei	50016807??																	
Pista sp.	50016807																	
Pista wui	50016807??																	
Platynereis bicanaliculata	5001240501																	
Podarkeopsis glabra	5001211903		3		1				1	1	1		1	1	5	2	1	
Polychaeta (larvae)	5001								3									
Polycirrus sp.	50016808																	
Polydora sp.	50014304																	
Polynoidae sp. Indet.	500102		3		1		2		4				1					
Praxillella pacifica	5001630906																	
Praxillella sp.	50016309																	
Prionospio jubata																		
Prionospio (Minuspio) lighti	5001430521		5	1	13		8		4		4			7	6	2	6	5

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB																		
Analyzed by Columbia Science (2006)																		
0-10 cm Depth and 0.5mm Sieve																		
												Fine	**Sand**					
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1132
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.0114		0.0165		0.0218		0.0134		0.0203		0.0086		0.0156		0.0186		0.0181
Mollusca weight (gm)*	juveniles	0.0192		0.0283		0.0171		0.0308		0.0139		0.0034		0.0077		0.0071		0.0072
Crustacea weight (gm)*	combined	0.0168		0.0334		0.0189		0.0296		0.0105		0.0061		0.0150		0.0117		0.0114
Polychaeta weight (gm)*		0.1474		0.1945		0.2198		0.1548		0.0874		0.0520		0.1311		0.1136		0.1215
Oligochaete weight (gm)*		0.0015		0.0015		0.0014		0.0004		0.0011		0.0036		0.0049		0.0021		0.0031
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Prionospio(Minuspio)multibranchiata	5001433601			2										1	1	2	3	1
Prionospio steenstrupi	5001430506						1							1				
Proceraea cornuta	5001230101																	
Pseudopolydora kempi	5001431501																	
Rhodine bitorquata	5001631001																	
Sabellidae (damaged)	500170																	
Scalibregma californicum	50015701??																	
Scoletoma luti	5001310109	1	2		2	1	1		4	2	2	1		5	2	3		4
Scoloplos sp.	50014003																	
Sigambra nr. bassi	5001220204		30		49		37		26		25		33		100		70	
Sphaerodoropsis sphaerulifer	5001260202				1		3		1		1							
Spiochaetopterus costarum	5001490302						1											
Spionidae	500143										1							
Spiophanes berkeleyorum	5001431004				1	1												
Sthenelais tertiaglabra	5001060305																	
Sternaspis fossor	5001590102		2		1				1						2			
Streblosoma pacifica	50016825??																	
Syllidae	500123																	
Syllis elongata	5001230308																	
Tenonia priops	5001022302				4					1	2				3			
Terebellidae (damaged)	500168																	
Terebellides sp.	50016901																	
Terebellides stroemi	5001690101																	
Trochochaeta multisetosa	5001450203				4		6		5		2				2	1	1	
Typosyllis alternata	5001230501																	
Notes:																		
No data-no weights																		
Plankton																		
Calanoida	6118	2		4		18		2		68				83		5		1
Hyperiid amphipods	617001																	
Other:																		
Nematoda	47	22		13		8		7		6		50		41		32		16

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB												
Analyzed by Columbia Science (2006)												
0-10 cm Depth and 0.5mm Sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1132	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		0.0096		0.0236		0.0105		0.0094		0.0189	
Mollusca weight (gm)*	juveniles		0.0156		0.0176		0.0137		0.0140		0.0208	
Crustacea weight (gm)*	combined		0.0152		0.0169		0.0163		0.0164		0.0148	
Polychaeta weight (gm)*			0.0582		0.0546		0.0584		0.0592		0.0758	
Oligochaete weight (gm)*			0.0011		0.0016		0.0017		0.0018		0.0024	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
MISCELLANEOUS												
Cnidaria												
Actiniaria	3758											
Campanulariidae colony frag.	370401											
Clytia sp. colony fragment	37040105											
Cnidaria Indet.	37											
Edwardsiidae	375901											
Halcampa decemtentaculata	3759040101											
Pachycerianthus fimbriatus	3743010303											
Peachia quinquecapitata	3759040201											
Pennatulacea	3754											
Stylatula elongata	3754010103											
Virgularia sp.	37540102											
Platyhelminthes												
Platyhelminthes Indet.	39									2	1	
Hirudinea												
Hirudinea Indet.	5012											
Nemertean	43											
Anopla	4301											
Carinoma mutabilis	4302020102											
Cerebratulus californiensis	4303020208	2				1		1				1
Heteronemertea	4303			1								1
Nemertea Indet.	43	4		1		4		2		2		3
Palaeonemertea	4302											
Tubulanidae	430201											
Tubulanus nothus	4302010108											
Tubulanus pellucidus	4302010104											
Tubulanus polymorphus	4302010102	8		5		5		7		8		8
Tubulanus sp.	43020101											
Echinoderm												
Amphiodia urtica/periercta	8129030199	2		3		2		2		4		5
Cucumaria piperata	8172060111											
Cucumaria sp.	81720601											
Ophiura sp.	81270106			4		1						
Pentamera pseudocalcigera	8172060301											
Pentamera sp.	81720603											
Bryozoa												
Bowerbankia gracilis frag.	7805010201											
Bryozoa colony fragment	78											
Cheilostomata colony fragment	7814											
Ascidiacea												
Molgula sp.	84060301											
Echiura												
Arhynchite pugettensis	7301020105											
Echiura Indet.	73											
Sipuncula												
Golfingiidae		30		31		25		27		30		45

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB												
Analyzed by Columbia Science (2006)												
0-10 cm Depth and 0.5mm Sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1132	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		0.0096		0.0236		0.0105		0.0094		0.0189	
Mollusca weight (gm)*	juveniles		0.0156		0.0176		0.0137		0.0140		0.0208	
Crustacea weight (gm)*	combined		0.0152		0.0169		0.0163		0.0164		0.0148	
Polychaeta weight (gm)*			0.0582		0.0546		0.0584		0.0592		0.0758	
Oligochaete weight (gm)*			0.0011		0.0016		0.0017		0.0018		0.0024	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Phascolosoma agassizi	72000020180											
Thysanocardia nigra	7200020169											
Oligochaeta												
Oligochaeta Indet.	5003		4		5		5		9		12	
MOLLUSCA												
Aplacophora												
Chaetoderma argenteum	5402010108											
Chaetoderma sp.	54020101											
Gastropoda												
Astyris gausapata	51050311	1										
Cephalaspidea Indet.	5110					1						
Cylichna attonsa	5110040205											
Cylichna sp.	51100402											
Epitonium sp.	51035001											
Gastropoda	51	1						2		2		
Haminoea sp.	51101201											
Haminoea vesicula	5110120101											
Margarites pupillus	5102100308											
Muricidae Indet.	510501											
Nassarius mendicus	5105080101											
Odostomia sp.	51080101											
Olivella baetica	5105100102											
Trichotropis cancellata	4103620204											
Turbonilla sp.	51080102	1								1		
Bivalvia												
Axinopsida serricata	5515020201	39		42		37		32		57		56
Bivalvia Indet.	55	85		48		66		75		54		48
Chlamys hastata	5509050101											
Compsomyax subdiaphana	5515470301											
Lucinoma annulatum	5515010201					2		1		1		1
Lyonsia californica	5520050202									1		
Mactridae	551525											
Macoma calcarea	5515310101											
Macoma carlottensis	5515310112											
Macoma nasuta	5515310114											
Macoma spp.	55153101	6		5		7		5		3		12
Macoma yoldiformis	5515310111											
Modiolus sp.	55070106											
Nuculoidea	5502	5		3		1		2				2
Pandora bilirata	5520020103											
Parvilucina tenuisculpta	5515010101	7		18		11		5		13		27
Rochefortia tumida	5515100102	33		34		43		24		18		51
Solamen columbianum	5507010301											
Tellina sp.	55153102											
Tresus sp.	55152502											
Yoldia seminuda	5502040505											
Nudibranch												

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB												
Analyzed by Columbia Science (2006)												
0-10 cm Depth and 0.5mm Sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1132	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		0.0096		0.0236		0.0105		0.0094		0.0189	
Mollusca weight (gm)*	juveniles		0.0156		0.0176		0.0137		0.0140		0.0208	
Crustacea weight (gm)*	combined		0.0152		0.0169		0.0163		0.0164		0.0148	
Polychaeta weight (gm)*			0.0582		0.0546		0.0584		0.0592		0.0758	
Oligochaete weight (gm)*			0.0011		0.0016		0.0017		0.0018		0.0024	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Corambe sp.	51310701											
Nudibranchia Indet.	5515310114											
Crustacea												
Americhelidium shoemakeri	6169371402			1						1		
Ampelisca agassizi	6169020111											
Aoroides sp.	61690616							1				
Axiopsis spinulicauda	6183020402											
Brachyura zoea	6184											
Cancer sp.	61880301											
Caprellidae	617101	1		1								
Cirripedia cypris	6130											
Cirripedia nauplii	6130			1						1		
Corycaeus anglicus	6120040101											
Cumella sp.	61540801											
Cylindroleberidae	611103		1			1				1	1	
Decapoda Indet. (zoea)	6175			1				1		1		1
Eobrolgus chumashi	6169421902											
Eudorella pacifica	6154040202											
Eudorellopsis longirostris	6154040306											
Euphilomedes carcharodonta	6111070301	17	1	17	1	15	4	25	4	54		15
Euphilomedes producta	6111070303	6	2	13	4	10		5		2		7
Gammaropsis thompsoni	6169260401											
Haliophasma geminatum	6160011601									1		
Harpacticoida	6119		1						5			
Heterophoxus affinis	6169420389											
Hippolytidae	617916											
Leptognathia gracilis	6157090102								1			
Leucon sp.	61540401	1						1				
Loxoconcha sp.	61131901				2	1			2			
Lysianassidae	616934											
Neotrypaea californiensis	6183040204											
Ostracoda	6110							1		4		
Pachynus cf. barnardi	6169343101			8		8		6		11		15
Parametopella sp.	61694807	4	1	6	4	11	1	10		1		2
Photis brevipes	6169260210						1					
Photis lacia	6169260211											
Photis sp.	61692602											
Phoxocephalidae	616942											
Pinnixa occidentalis Cmplx	6189060403											
Pinnixa sp.	61890604											
Pinnotheridae	618906											
Pleurogonium sp.	61632302				1							
Podoceropsis angustimana	1692605??											
Poecillostomatoida	6120		1		10		8		1			1
Prachynella lodo	6169345701		1								1	
Protomedeia sp.	61692603	3		4		5		4		5	1	5
Rhepoxynius boreovariatus	61694215??				1			1		3	1	7

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB												
Analyzed by Columbia Science (2006)												
0-10 cm Depth and 0.5mm Sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1132	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		0.0096		0.0236		0.0105		0.0094		0.0189	
Mollusca weight (gm)*	juveniles		0.0156		0.0176		0.0137		0.0140		0.0208	
Crustacea weight (gm)*	combined		0.0152		0.0169		0.0163		0.0164		0.0148	
Polychaeta weight (gm)*			0.0582		0.0546		0.0584		0.0592		0.0758	
Oligochaete weight (gm)*			0.0011		0.0016		0.0017		0.0018		0.0024	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Rhepoxynius sp.	61694215											
Westwoodilla caecula	6169371502											
Polychaeta												
Amaeana sp.	50016823											
Amage anops	5001670101											
Ampharete acutifrons	5001670208											
Ampharete finmarchica	5001670214											
Ampharete sp.	50016702											
Aphelochaeta glandaria	50015003											
Aphelochaeta monilaris	5001500301							1				
Aphelochaeta sp.	50015003											
Aphrodita japonica	5001010101											
Aphrodita sp.	50010101											
Aricidea lopezi	5001411302							1		1		
Aricidea ramosa	5001410289	1										
Aricidea sp.	50014102											
Artacama coniferi	5001681101											
Axiothella sp.	50016308											
Brada villosa	5001540102											
Capitella capitata Cmplx.	5001600101	1		1		1		4		3		1
Caulleriella sp.	50015002											
Chone sp.	50017001											
Cirratulidae	500150											
Cossura pygodactylata	5001520106											
Cossura spp.	50015201	15		9		6		14		3		7
Decamastus gracilis	5001600501											
Diopatra ornata	5001290202											
Dipolydora socialis	5001430402											
Dipolydora sp.	50014304					1		2		1		
Dorvilleidae	500136							1				
Errano bicirrata	5001310101											
Eteone longa	5001130205											
Eteone spetsbergensis	5001130202											
Eteone sp.	50011302	1	1				1				1	
Euclymeninae Indet.	5001631											
Eumida longicornuta	5001131108					1				5		2
Eunoe nr. senta	5001020504											
Exogone spp.	50012307				4	2	4		1		1	1
Glycera americana	5001270104											
Glycera nana	5001270129	10		9		10		12		7		13
Glycera robusta	5001270106											
Glycera sp.	50012701											
Glycinde armigera	5001280103	5		1				1				1
Goniada brunnea	5001280203											
Harmothoe sp.	50010208											
Hesperonoe sp.	50010217											
Heteromastus filobranchus	5001600203											
Laonice cirrata	5001430201	1										

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB												
Analyzed by Columbia Science (2006)												
0-10 cm Depth and 0.5mm Sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1132	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		0.0096		0.0236		0.0105		0.0094		0.0189	
Mollusca weight (gm)*	juveniles		0.0156		0.0176		0.0137		0.0140		0.0208	
Crustacea weight (gm)*	combined		0.0152		0.0169		0.0163		0.0164		0.0148	
Polychaeta weight (gm)*			0.0582		0.0546		0.0584		0.0592		0.0758	
Oligochaete weight (gm)*			0.0011		0.0016		0.0017		0.0018		0.0024	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Leitoscoloplos pugettensis	5001401601	1		6		3		2		4		3
Lepidasthenia berkeleyae	5001021801									1		
Levinsenia gracilis	5001410801	28	1	6	4	12	3	6	4	7	7	10
Lumbrineridae Indet.	500131											
Lumbrineris cruzensis	5001310118											
Lumbrineris sp.	50013101											
Magelona longicornis	5001440105											
Magelona sp.	50014401											
Maldane sarsi	5001630301											
Malmgreniella macginieti	50010226??											
Malmgreniella sp.	50010226											
Mediomastus sp.	50016004	1					4	1		3	1	4
Mesochaetopterus taylori	5001490401											
Nephtys assignis	5001250121											
Nephtys caeca	5001250103											
Nephtys cornuta	5001250104	50	10	10	14	20	13	8	5	23	12	13
Nephtys ferruginea	5001250111									1		1
Nereis procera	5001240404											
Nereis sp.	50012404	1		1				2		1		1
Notoproctus pacificus	5001630601											
Onuphis iridescens	5001290103											
Parandalia fauveli	5001220802											
Paraprionospio pinnata	5001431701	2				1		4				
Pectinaria californiensis	5001660304	262		212		144		128		242		312
Pectinaria sp.	50016603											
Pholoe glabra	5001060102	47		4		11	1	6		4	2	22
Pholoides aspera	5001040202		1			1		1		1		
Phyllodoce groenlandica	5001130102			1		1						
Phyllodoce hartmanae	5001131402											
Phyllodoce sp.	50011314	1						1		2		1
Phyllodocidae Indet.	500113											
Phylo felix	5001400401			1								2
Pilargis berkeleyae	5001220301	1		1				2		1		
Pista agassizi	50016807??											
Pista bansei	50016807??											
Pista sp.	50016807											
Pista wui	50016807??											
Platynereis bicanaliculata	5001240501											
Podarkeopsis glabra	5001211903				1	1		1	2			
Polychaeta (larvae)	5001											
Polycirrus sp.	50016808											
Polydora sp.	50014304											
Polynoidae sp. Indet.	500102	1		1		1		3				3
Praxillella pacifica	5001630906											
Praxillella sp.	50016309											
Prionospio jubata										1		
Prionospio (Minuspio) lighti	5001430521	12		6	4	8		20		14	3	3

PSDDA ANDERSON KETRON SITE BENTHIC INVERTEB												
Analyzed by Columbia Science (2006)												
0-10 cm Depth and 0.5mm Sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1132	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		0.0096		0.0236		0.0105		0.0094		0.0189	
Mollusca weight (gm)*	juveniles		0.0156		0.0176		0.0137		0.0140		0.0208	
Crustacea weight (gm)*	combined		0.0152		0.0169		0.0163		0.0164		0.0148	
Polychaeta weight (gm)*			0.0582		0.0546		0.0584		0.0592		0.0758	
Oligochaete weight (gm)*			0.0011		0.0016		0.0017		0.0018		0.0024	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Prionospio(Minuspio)multibranchiata	5001433601						1	2				
Prionospio steenstrupi	5001430506											
Proceraea cornuta	5001230101											
Pseudopolydora kempi	5001431501											
Rhodine bitorquata	5001631001											
Sabellidae (damaged)	500170											
Scalibregma californicum	50015701??									1		1
Scoletoma luti	5001310109		1		1	1	1		1			
Scoloplos sp.	50014003											
Sigambra nr. bassi	5001220204	87		24		18		26		22		17
Sphaerodoropsis sphaerulifer	5001260202	1										
Spiochaetopterus costarum	5001490302											
Spionidae	500143											
Spiophanes berkeleyorum	5001431004											
Sthenelais tertiaglabra	5001060305											
Sternaspis fossor	5001590102	1										
Streblosoma pacifica	50016825??											
Syllidae	500123				1	1				1		
Syllis elongata	5001230308											
Tenonia priops	5001022302	2		2	1	1		1		3		
Terebellidae (damaged)	500168											
Terebellides sp.	50016901											
Terebellides stroemi	5001690101											
Trochochaeta multisetosa	5001450203	1		5		4		7		5		6
Typosyllis alternata	5001230501											
Notes:												
No data-no weights												
Plankton												
Calanoida	6118		6		1		0		2		0	
Hyperiid amphipods	617001											
Other:												
Nematoda	47		10		11		9		11		8	

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1358	1358	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0976		0.0657		0.0934		0.1757		0.0241		0.0438		8.0431		5.1966	
Mollusca weight (gm)*	juveniles	0.0480		0.0951		0.0950		0.3097		0.0747		0.1857		0.5877		1.6516	
Crustacea weight (gm)*	combined	0.0903		0.0229		0.7788		0.0344		0.0912		0.2030		0.1931		0.0711	
Polychaeta weight (gm)*		2.1038		2.0430		3.0185		3.1000		2.9061		2.8846		1.2859		2.0714	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
MISCELLANEOUS																	
Cnidaria Indet.																	
Campanulariidae colony frag.	370401													1			
Cnidaria Indet.	37																
Halcampa decemtentaculata	3759040101			3		2						2					
Pachycerianthus fimbriatus	3743010303																
Peachia quinquecapitata	3759040201	1															
Pennatulacea	3754				1		3	1	1		3		4		1		4
Stylatula elongata	3754010103													1		1	
Platyhelminthes																	
Platyhelminthes Indet.	39																
Hirudinea																	
Hirudinea Indet.	5012																
Nemertean	43																
Anopla	4301																
Cerebratulus californiensis	4303020208																
Heteronemertea	4303											1					
Nemertea Indet.	43																
Palaeonemertea	4302															1	
Tubulanidae	430201	1															
Tubulanus nothus	4302010108																
Tubulanus pellucidus	4302010104																
Tubulanus polymorphus	4302010102					2		1		2		1					
Echinoderm																	
Amphiodia urtica/periercta	8129030199	2					1				1		2		1		
Cucumaria piperata	8172060111																
Ophiura sp.	81270106																
Pentamera pseudocalcigera	8172060301																
Pentamera sp.	81720603																
Bryozoa																	
Bowerbankia gracilis frag.	7805010201											1					
Bryozoa colony fragment	78					1		1									
Cheilostomata colony fragment	7814																
Ascidiacea																	
Molgula sp.	84060301																
Echiura																	
Arhynchite pugettensis	7301020105																
Sipuncula																	
Thysanocardia nigra	7200020169																
MOLLUSCA																	
Aplacophora Indet.																	
Chaetoderma argenteum	5402010108							1									
Gastropoda																	
Astyris gausapata	5105311					3		2				2		1		1	
Cephalaspidea Indet.	5110																
Cylichna attonsa	5110040205																
Cylichna sp.	51100402																
Epitonium sp.	51035001									1							

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1358	1358	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0976		0.0657		0.0934		0.1757		0.0241		0.0438		8.0431		5.1966	
Mollusca weight (gm)*	juveniles	0.0480		0.0951		0.0950		0.3097		0.0747		0.1857		0.5877		1.6516	
Crustacea weight (gm)*	combined	0.0903		0.0229		0.7788		0.0344		0.0912		0.2030		0.1931		0.0711	
Polychaeta weight (gm)*		2.1038		2.0430		3.0185		3.1000		2.9061		2.8846		1.2859		2.0714	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Haminoea vesicula	5110120101																
Margarites pupillus	5102100308																
Muricidae Indet.	510501																
Nassarius mendicus	5105080101																
Odostomia sp.	51080101																
Olivella baetica	5105100102																
Turbonilla sp.	51080102																
Bivalvia																	
Axinopsida serricata	5515020201	14		37	16	4	4	13	9	21	19	15	20	6	4	16	16
Bivalvia Indet.	55																
Chlamys hastata	5509050101																
Lucinoma annulatum	5515010201				1	1		2						1			
Lyonsia californica	5520050202				1												
Macoma calcarea	5515310101																
Macoma carlottensis	5515310112																
Macoma sp.	55153101		2		2				2		2		8		4		2
Macoma yoldiformis	5515310111							2								1	
Modiolus sp.	55070106																
Pandora bilirata	5520020103																
Parvilucina tenuisculpta	5515010101	1	3	4	4	5	3		2		5	3	5	2	1	1	4
Rochefortia tumida	5515100102	2		2				1		3		4		2			
Tresus sp.	55152502																
Yoldia seminuda	5502040505			1	2				2								1
Nudibranch																	
Corambe sp.	51310701							1									
Crustacea																	
Ampelisca agassizi	6169020111																
Aoroides sp.	61690616																
Axiopsis spinulicauda	6183020402																
Cancer sp.	61880301																
Cylindroleberidae	611103																
Eudorella pacifica	6154040202															1	
Euphilomedes carcharodonta	6111070301	3		5		4				1		1				5	
Euphilomedes producta	6111070303			2		1						1					
Gammaropsis thompsoni	6169260401																
Heterophoxus affinis	6169420389							1		1							
Hippolytidae	617916								1								
Neotrypaea californiensis	6183040204																
Pachynus cf. barnardi	6169343101																
Parametopella sp.	61694807			2										2		1	
Pinnixa occidentalis Cmplx	6189060403	8				1		3		7		18		6		6	1
Pinnixa sp.	61890604													1			
Podoceropsis angustimana	1692605??																
Prachynella lodo	6169345701			1													
Protomedeia sp.	61692603	1		2		3		2		5		12		3		5	
Rhepoxynius boreovariatus	61694215??																
Polychaeta																	
Amaeana sp.	50016823																

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1358	1358	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0976		0.0657		0.0934		0.1757		0.0241		0.0438		8.0431		5.1966	
Mollusca weight (gm)*	juveniles	0.0480		0.0951		0.0950		0.3097		0.0747		0.1857		0.5877		1.6516	
Crustacea weight (gm)*	combined	0.0903		0.0229		0.7788		0.0344		0.0912		0.2030		0.1931		0.0711	
Polychaeta weight (gm)*		2.1038		2.0430		3.0185		3.1000		2.9061		2.8846		1.2859		2.0714	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Amage anops	5001670101															1	
Ampharete acutifrons	5001670208																
Ampharete finmarchica	5001670214																
Ampharete sp.	50016702																
Aphelochaeta glandaria	50015003																
Aphelochaeta monilaris	5001500301							1		2		2				1	
Aphelochaeta sp.	50015003																
Aphrodita japonica	5001010101																
Aphrodita sp.	50010101																
Aricidea lopezi	5001411302																
Aricidea ramosa	5001410289							1									
Artacama coniferi	5001681101							1									
Brada villosa	5001540102					2										1	
Caulleriella sp.	50015002																
Chone sp.	50017001																
Cirratulidae	500150																
Cossura pygodactylata	5001520106							1								1	
Cossura spp.	50015201																
Diopatra ornata	5001290202																
Dipolydora socialis	5001430402															1	
Dipolydora sp.	50014304																
Errano bicirrata	5001310101			1													
Eteone longa	5001130205																
Eteone spetsbergensis	5001130202							1									
Eteone sp.	50011302								1								
Euclymeninae Indet.	5001631																
Eumida longicornuta	5001131108														1		1
Eunoe nr. senta	5001020504	1															
Glycera nana	5001270129		3		2	1	2		1	2	1	1	2		1		2
Glycinde armigera	5001280103															2	
Goniada brunnea	5001280203																
Harmothoe sp.	50010208																
Heteromastus filobranchus	5001600203																
Laonice cirrata	5001430201			2			1	2		2		3		2			
Leitoscoloplos pugettensis	5001401601			4				2									2
Lepidasthenia berkeleyae	5001021801					3		2		2	1	2		2	1	2	1
Levinsenia gracilis	5001410801	31		10		28		26		28		22		30		15	
Lumbrineridae Indet.	500131																
Lumbrineris cruzensis	5001310118																
Lumbrineris sp.	50013101																
Magelona sp.	50014401																
Maldane sarsi	5001630301																
Malmgreniella macginieti	50010226??																
Malmgreniella sp.	50010226								1		1						
Mediomastus sp.	50016004							1								1	
Nephtys caeca	5001250103																
Nephtys cornuta	5001250104					1								1		1	
Nephtys ferruginea	5001250111									1						1	
Nereis procera	5001240404								1				4		1	1	2

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTEBRATE SAMPLES 2005																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05
Time		1348	1348	1358	1358	1433	1433	1446	1446	1504	1504	1116	1116	1143	1143	1155	1155
Station		AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT01	AKT02	AKT02	AKT02	AKT02	AKT02	AKT02
Replicate		Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C
Miscellaneous weight (gm)*	*adults and	0.0976		0.0657		0.0934		0.1757		0.0241		0.0438		8.0431		5.1966	
Mollusca weight (gm)*	juveniles	0.0480		0.0951		0.0950		0.3097		0.0747		0.1857		0.5877		1.6516	
Crustacea weight (gm)*	combined	0.0903		0.0229		0.7788		0.0344		0.0912		0.2030		0.1931		0.0711	
Polychaeta weight (gm)*		2.1038		2.0430		3.0185		3.1000		2.9061		2.8846		1.2859		2.0714	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Notoproctus pacificus	5001630601																
Onuphis iridescens	5001290103	1						1		1		1					
Parandalia fauveli	5001220802																
Paraprionospio pinnata	5001431701	1		1			1			3	2			2			
Pectinaria californiensis	5001660304	1										1					
Pectinaria sp.	50016603				2								1		1		
Pholoe glabra	5001060102			1						1						1	
Pholoides aspera	5001040202																
Phyllodoce groenlandica	5001130102																
Phyllodoce hartmanae	5001131402																
Phyllodoce sp.	50011314																
Phyllodocidae Indet.	500113																
Pilargis berkeleyae	5001220301			1		1										1	
Pista agassizi	50016807??									1							
Pista bansei	50016807??																
Pista sp.	50016807																
Pista wui	50016807??																
Platynereis bicanaliculata	5001240501																
Podarkeopsis glabra	5001211903													1			
Polycirrus sp.	50016808															2	
Polynoidae sp. Indet.	500102									1		1					
Praxillella pacifica	5001630906	2				4		2		4							
Praxillella sp.	50016309											4		2		2	
Prionospio (Minuspio) lighti	5001430521	1								1							
Prionospio(Minuspio)multibranchiata	5001433601																
Prionospio steenstrupi	5001430506	1								1		2				2	
Rhodine bitorquata	5001631001																
Scalibregma californicum	50015701??																
Scoletoma luti	5001310109	1		1		1						3		2			
Scoloplos sp.	50014003																
Sigambra nr. bassi	5001220204			2		2							4	3	2		2
Sphaerodoropsis sphaerulifer	5001260202																
Spiophanes berkeleyorum	5001431004	1		3		1		3				1	1				
Sthenelais tertiaglabra	5001060305							1									
Sternaspis fossor	5001590102																
Streblosoma pacifica	50016825??																
Syllis elongata	5001230308																
Tenonia priops	5001022302	1								3		4		1			
Terebellides stroemi	5001690101																
Trochochaeta multisetosa	5001450203														1		
Notes:																	
No data-no weights																	
Plankton																	
Calanoida	6118													1			
Hyperiid amphipods	617001			1				1									
Other:																	
Nematoda	47																

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.1577		0.0194		0.7117		2.9016		0.0595		0.0625		0.0926		0.3587	
Mollusca weight (gm)*	juveniles	0.6901		0.0564		0.0669		0.1887		0.1585		0.1698		0.1739		0.4991	
Crustacea weight (gm)*	combined	0.0152		0.0584		0.2584		0.1268		0.5824		0.0431		0.1973		0.3184	
Polychaeta weight (gm)*		0.9294		2.3012		3.5153		2.1233		4.0854		1.2225		3.6674		6.9644	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
MISCELLANEOUS																	
Cnidaria Indet.																	
Campanulariidae colony frag.	370401	1															
Cnidaria Indet.	37																
Halcampa decemtentaculata	3759040101									2				4		2	
Pachycerianthus fimbriatus	3743010303														1		
Peachia quinquecapitata	3759040201													1			
Pennatulacea	3754		3		3		3				2		4		1		
Stylatula elongata	3754010103	1				1		1						1			
Platyhelminthes																	
Platyhelminthes Indet.	39																
Hirudinea																	
Hirudinea Indet.	5012																
Nemertean	43																
Anopla	4301																
Cerebratulus californiensis	4303020208	1			1							2					
Heteronemertea	4303	3		1										1		1	
Nemertea Indet.	43																
Palaeonemertea	4302													1			
Tubulanidae	430201											1					
Tubulanus nothus	4302010108																
Tubulanus pellucidus	4302010104																
Tubulanus polymorphus	4302010102	1		1		1						1				1	
Echinoderm																	
Amphiodia urtica/periercta	8129030199				1		1		4		3		1	1	2	9	17
Cucumaria piperata	8172060111																
Ophiura sp.	81270106																
Pentamera pseudocalcigera	8172060301					1											
Pentamera sp.	81720603																
Bryozoa																	
Bowerbankia gracilis frag.	7805010201																
Bryozoa colony fragment	78																
Cheilostomata colony fragment	7814																
Ascidiacea																	
Molgula sp.	84060301																
Echiura																	
Arhynchite pugettensis	7301020105	1														1	
Sipuncula																	
Thysanocardia nigra	7200020169																
MOLLUSCA																	
Aplacophora Indet.																	
Chaetoderma argenteum	5402010108			1				1		1						1	
Gastropoda																	
Astyris gausapata	5105311							1	1	1			1	1			1
Cephalaspidea Indet.	5110																
Cylichna attonsa	5110040205							1								1	
Cylichna sp.	51100402																
Epitonium sp.	51035001																

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.1577		0.0194		0.7117		2.9016		0.0595		0.0625		0.0926		0.3587	
Mollusca weight (gm)*	juveniles	0.6901		0.0564		0.0669		0.1887		0.1585		0.1698		0.1739		0.4991	
Crustacea weight (gm)*	combined	0.0152		0.0584		0.2584		0.1268		0.5824		0.0431		0.1973		0.3184	
Polychaeta weight (gm)*		0.9294		2.3012		3.5153		2.1233		4.0854		1.2225		3.6674		6.9644	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Haminoea vesicula	5110120101																
Margarites pupillus	5102100308																
Muricidae Indet.	510501																
Nassarius mendicus	5105080101															1	
Odostomia sp.	51080101																
Olivella baetica	5105100102																
Turbonilla sp.	51080102																
Bivalvia																	
Axinopsida serricata	5515020201	14	10	8	6	13	9	6	2	1		45	8		1	9	
Bivalvia Indet.	55																
Chlamys hastata	5509050101																
Lucinoma annulatum	5515010201	1							1						1		1
Lyonsia californica	5520050202							1		1							
Macoma calcarea	5515310101																
Macoma carlottensis	5515310112			1													
Macoma sp.	55153101		1		2		1				3		2		4		1
Macoma yoldiformis	5515310111								1			1					
Modiolus sp.	55070106																
Pandora bilirata	5520020103																
Parvilucina tenuisculpta	5515010101	1	4		1	2	2	5	2	2	1	2	2	2	4	8	3
Rochefortia tumida	5515100102	2		2		2				1		1		1		4	
Tresus sp.	55152502																
Yoldia seminuda	5502040505											1					2
Nudibranch																	
Corambe sp.	51310701																
Crustacea																	
Ampelisca agassizi	6169020111																
Aoroides sp.	61690616															2	
Axiopsis spinulicauda	6183020402					1				1							
Cancer sp.	61880301																
Cylindroleberidae	611103																
Eudorella pacifica	6154040202																
Euphilomedes carcharodonta	6111070301	3		4		7		3		10		8		3		24	
Euphilomedes producta	6111070303	1		1						6		3		2		9	
Gammaropsis thompsoni	6169260401																
Heterophoxus affinis	6169420389																
Hippolytidae	617916																
Neotrypaea californiensis	6183040204																1
Pachynus cf. barnardi	6169343101																
Parametopella sp.	61694807																
Pinnixa occidentalis Cmplx	6189060403			5		4		1	1	4	1	3		8		19	3
Pinnixa sp.	61890604																
Podoceropsis angustimana	1692605??																
Prachynella lodo	6169345701																
Protomedeia sp.	61692603	5				2		4		9		4		8		2	
Rhepoxynius boreovariatus	61694215??																
Polychaeta																	
Amaeana sp.	50016823																

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.1577		0.0194		0.7117		2.9016		0.0595		0.0625		0.0926		0.3587	
Mollusca weight (gm)*	juveniles	0.6901		0.0564		0.0669		0.1887		0.1585		0.1698		0.1739		0.4991	
Crustacea weight (gm)*	combined	0.0152		0.0584		0.2584		0.1268		0.5824		0.0431		0.1973		0.3184	
Polychaeta weight (gm)*		0.9294		2.3012		3.5153		2.1233		4.0854		1.2225		3.6674		6.9644	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Amage anops	5001670101							1						1			
Ampharete acutifrons	5001670208																
Ampharete finmarchica	5001670214							1									
Ampharete sp.	50016702																
Aphelochaeta glandaria	50015003																
Aphelochaeta monilaris	5001500301	1				1		1									
Aphelochaeta sp.	50015003													1			
Aphrodita japonica	5001010101																
Aphrodita sp.	50010101												1		1		
Aricidea lopezi	5001411302																
Aricidea ramosa	5001410289																
Artacama coniferi	5001681101							1									
Brada villosa	5001540102																
Caulleriella sp.	50015002																
Chone sp.	50017001																
Cirratulidae	500150																
Cossura pygodactylata	5001520106																
Cossura spp.	50015201																
Diopatra ornata	5001290202																
Dipolydora socialis	5001430402																
Dipolydora sp.	50014304					2											
Errano bicirrata	5001310101													1			
Eteone longa	5001130205																
Eteone spetsbergensis	5001130202																
Eteone sp.	50011302																
Euclymeninae Indet.	5001631					1	1		1			4				3	
Eumida longicornuta	5001131108		1				1										
Eunoe nr. senta	5001020504																
Glycera nana	5001270129		2	1		1	3		1		2				4		5
Glycinde armigera	5001280103															1	
Goniada brunnea	5001280203							1									
Harmothoe sp.	50010208																
Heteromastus filobranchus	5001600203																
Laonice cirrata	5001430201	1	1	3	3	1		2	1			1		2		1	
Leitoscoloplos pugettensis	5001401601		4		2	3	1			1	1	2		1		1	
Lepidasthenia berkeleyae	5001021801	1		2	1	3		4		4		3		3		3	
Levinsenia gracilis	5001410801	9		23		23		13		12		15		24		15	
Lumbrineridae Indet.	500131																
Lumbrineris cruzensis	5001310118																
Lumbrineris sp.	50013101									1		1				2	
Magelona sp.	50014401											1					
Maldane sarsi	5001630301																
Malmgreniella macginieti	50010226??															2	
Malmgreniella sp.	50010226																
Mediomastus sp.	50016004															1	
Nephtys caeca	5001250103															1	
Nephtys cornuta	5001250104			1										1			
Nephtys ferruginea	5001250111					1										1	
Nereis procera	5001240404		3		3		2				3		1		1	1	

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																	
Analyzed by Columbia Science																	
0-10 cm depth fraction and 1mm sieve																	
Date		6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/30/05	6/29/05	6/29/05
Time		1213	1213	1231	1231	859	859	914	914	949	949	1003	1003	1020	1020	1533	1533
Station		AKT02	AKT02	AKT02	AKT02	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKT03	AKB02	AKB02
Replicate		Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A
Miscellaneous weight (gm)*	*adults and	0.1577		0.0194		0.7117		2.9016		0.0595		0.0625		0.0926		0.3587	
Mollusca weight (gm)*	juveniles	0.6901		0.0564		0.0669		0.1887		0.1585		0.1698		0.1739		0.4991	
Crustacea weight (gm)*	combined	0.0152		0.0584		0.2584		0.1268		0.5824		0.0431		0.1973		0.3184	
Polychaeta weight (gm)*		0.9294		2.3012		3.5153		2.1233		4.0854		1.2225		3.6674		6.9644	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Notoproctus pacificus	5001630601																
Onuphis iridescens	5001290103	1				1		1		1						3	
Parandalia fauveli	5001220802																
Paraprionospio pinnata	5001431701	2							1	3		1	3			1	
Pectinaria californiensis	5001660304									1				1			2
Pectinaria sp.	50016603				1				1		1						
Pholoe glabra	5001060102									1						3	
Pholoides aspera	5001040202																
Phyllodoce groenlandica	5001130102												1				
Phyllodoce hartmanae	5001131402																
Phyllodoce sp.	50011314													1			
Phyllodocidae Indet.	500113								1								
Pilargis berkeleyae	5001220301	1								1		2					
Pista agassizi	50016807??					1				1				1			
Pista bansei	50016807??																
Pista sp.	50016807																
Pista wui	50016807??															1	
Platynereis bicanaliculata	5001240501																
Podarkeopsis glabra	5001211903	2															
Polycirrus sp.	50016808						1										
Polynoidae sp. Indet.	500102	1		1			1				2			1			
Praxillella pacifica	5001630906					3		3		2		1		2		7	2
Praxillella sp.	50016309	2		2													
Prionospio (Minuspio) lighti	5001430521			1								1					
Prionospio(Minuspio)multibranchiata	5001433601																
Prionospio steenstrupi	5001430506							1			1						
Rhodine bitorquata	5001631001									1		1					
Scalibregma californicum	50015701??																
Scoletoma luti	5001310109	2				2		2		1				3			
Scoloplos sp.	50014003				1												
Sigambra nr. bassi	5001220204			2	2		6					2		1	1		
Sphaerodoropsis sphaerulifer	5001260202									1		1					
Spiophanes berkeleyorum	5001431004	3				3		5	1		3	2		1		3	
Sthenelais tertiaglabra	5001060305																
Sternaspis fossor	5001590102							1									
Streblosoma pacifica	50016825??																
Syllis elongata	5001230308															1	
Tenonia priops	5001022302	1						2		2		1				1	
Terebellides stroemi	5001690101																
Trochochaeta multisetosa	5001450203						1		1				1		1		
Notes:																	
No data-no weights																	
Plankton																	
Calanoida	6118																
Hyperiid amphipods	617001																
Other:																	
Nematoda	47																

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																		
Analyzed by Columbia Science																		
0-10 cm depth fraction and 1mm sieve																		
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1137
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.1372		0.4502		0.3501		0.1275		0.2187		0.6423		0.1830		0.0795		0.2441
Mollusca weight (gm)*	juveniles	0.2983		0.1337		0.0850		0.1592		0.1189		0.1292		0.1418		0.1722		0.1486
Crustacea weight (gm)*	combined	0.1831		0.1359		0.1520		0.0908		0.2047		0.1470		0.3592		0.3346		0.7017
Polychaeta weight (gm)*		5.4010		2.9588		5.3878		1.1078		3.2146		2.2248		6.4771		1.7816		5.5644
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
MISCELLANEOUS																		
Cnidaria Indet.																		
Campanulariidae colony frag.	370401																	
Cnidaria Indet.	37																	
Halcampa decemtentaculata	3759040101	2		1				1								2		
Pachycerianthus fimbriatus	3743010303																	
Peachia quinquecapitata	3759040201																	
Pennatulacea	3754																	
Stylatula elongata	3754010103									1		1						
Platyhelminthes																		
Platyhelminthes Indet.	39			1								1						2
Hirudinea																		
Hirudinea Indet.	5012																	
Nemertean	43																	
Anopla	4301					1												
Cerebratulus californiensis	4303020208																	
Heteronemertea	4303											1				1		
Nemertea Indet.	43					2				2		1				4		2
Palaeonemertea	4302																	
Tubulanidae	430201																	
Tubulanus nothus	4302010108																	
Tubulanus pellucidus	4302010104	2								1		1						
Tubulanus polymorphus	4302010102			2		2		2		2		2		1		3		1
Echinoderm																		
Amphiodia urtica/periercta	8129030199	4	6	10	13	10	16	2	13	3	3	4	5	2	5	3	5	4
Cucumaria piperata	8172060111																	
Ophiura sp.	81270106																	
Pentamera pseudocalcigera	8172060301																	
Pentamera sp.	81720603		1															
Bryozoa																		
Bowerbankia gracilis frag.	7805010201																	
Bryozoa colony fragment	78																	
Cheilostomata colony fragment	7814																	
Ascidiacea																		
Molgula sp.	84060301																	
Echiura																		
Arhynchite pugettensis	7301020105																	
Sipuncula																		
Thysanocardia nigra	7200020169	1			1													
MOLLUSCA																		
Aplacophora Indet.																		
Chaetoderma argenteum	5402010108	1				1				2		2						
Gastropoda																		
Astyris gausapata	5105311		1								1	1		2				2
Cephalaspidea Indet.	5110			1														
Cylichna attonsa	5110040205									1								
Cylichna sp.	51100402																	
Epitonium sp.	51035001																	

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																		
Analyzed by Columbia Science																		
0-10 cm depth fraction and 1mm sieve																		
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1137
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.1372		0.4502		0.3501		0.1275		0.2187		0.6423		0.1830		0.0795		0.2441
Mollusca weight (gm)*	juveniles	0.2983		0.1337		0.0850		0.1592		0.1189		0.1292		0.1418		0.1722		0.1486
Crustacea weight (gm)*	combined	0.1831		0.1359		0.1520		0.0908		0.2047		0.1470		0.3592		0.3346		0.7017
Polychaeta weight (gm)*		5.4010		2.9588		5.3878		1.1078		3.2146		2.2248		6.4771		1.7816		5.5644
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Haminoea vesicula	5110120101																	
Margarites pupillus	5102100308																	
Muricidae Indet.	510501																	
Nassarius mendicus	5105080101																	
Odostomia sp.	51080101		1			1				1								
Olivella baetica	5105100102	1																
Turbonilla sp.	51080102																1	
Bivalvia																		
Axinopsida serricata	5515020201	8		14		10		7		3		2		3		5		
Bivalvia Indet.	55								1									
Chlamys hastata	5509050101																	
Lucinoma annulatum	5515010201	1			2		2		1						2			
Lyonsia californica	5520050202																	
Macoma calcarea	5515310101																	
Macoma carlottensis	5515310112							2										
Macoma sp.	55153101				2		1		1									
Macoma yoldiformis	5515310111							3				1				2		1
Modiolus sp.	55070106																	
Pandora bilirata	5520020103						1											
Parvilucina tenuisculpta	5515010101	6		4	1	5	3	1	1	1	3		3			2	3	
Rochefortia tumida	5515100102			3		3				8		5		1		6		4
Tresus sp.	55152502																	
Yoldia seminuda	5502040505		4		5		2				4		1					
Nudibranch																		
Corambe sp.	51310701																	
Crustacea																		
Ampelisca agassizi	6169020111																	
Aoroides sp.	61690616																	
Axiopsis spinulicauda	6183020402																	
Cancer sp.	61880301																	
Cylindroleberidae	611103	1																
Eudorella pacifica	6154040202			1														
Euphilomedes carcharodonta	6111070301	31		33		37		37		13		19		22		18		30
Euphilomedes producta	6111070303	5		5		5		5		3		2		2		1		3
Gammaropsis thompsoni	6169260401																	
Heterophoxus affinis	6169420389																	
Hippolytidae	617916																	
Neotrypaea californiensis	6183040204		1								1		1				1	
Pachynus cf. barnardi	6169343101							1										
Parametopella sp.	61694807																	1
Pinnixa occidentalis Cmplx	6189060403	10		7		8	2	3	1	15		17	5	26	3	15	2	12
Pinnixa sp.	61890604																	
Podoceropsis angustimana	1692605??																	
Prachynella lodo	6169345701			1		1				1		1						
Protomedeia sp.	61692603	5		4				2		1		1				3		1
Rhepoxynius boreovariatus	61694215??			1														
Polychaeta																		
Amaeana sp.	50016823																	

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																		
Analyzed by Columbia Science																		
0-10 cm depth fraction and 1mm sieve																		
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1137
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.1372		0.4502		0.3501		0.1275		0.2187		0.6423		0.1830		0.0795		0.2441
Mollusca weight (gm)*	juveniles	0.2983		0.1337		0.0850		0.1592		0.1189		0.1292		0.1418		0.1722		0.1486
Crustacea weight (gm)*	combined	0.1831		0.1359		0.1520		0.0908		0.2047		0.1470		0.3592		0.3346		0.7017
Polychaeta weight (gm)*		5.4010		2.9588		5.3878		1.1078		3.2146		2.2248		6.4771		1.7816		5.5644
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Amage anops	5001670101			1														1
Ampharete acutifrons	5001670208															1		
Ampharete finmarchica	5001670214																	
Ampharete sp.	50016702								1									
Aphelochaeta glandaria	50015003																	
Aphelochaeta monilaris	5001500301		1		1	1						1		1				
Aphelochaeta sp.	50015003									1								
Aphrodita japonica	5001010101			1														
Aphrodita sp.	50010101																	
Aricidea lopezi	5001411302	1								2								
Aricidea ramosa	5001410289			2														1
Artacama coniferi	5001681101					1								1				1
Brada villosa	5001540102																	
Caulleriella sp.	50015002																	
Chone sp.	50017001																	
Cirratulidae	500150																	
Cossura pygodactylata	5001520106																	
Cossura spp.	50015201									1								
Diopatra ornata	5001290202																	
Dipolydora socialis	5001430402													3				
Dipolydora sp.	50014304																	
Errano bicirrata	5001310101					1												
Eteone longa	5001130205															1		
Eteone spetsbergensis	5001130202																	
Eteone sp.	50011302															3		
Euclymeninae Indet.	5001631														1			
Eumida longicornuta	5001131108						1				1				1			
Eunoe nr. senta	5001020504																	
Glycera nana	5001270129		2		5	1	2		4		4		4	1	3		4	
Glycinde armigera	5001280103	1	1				1											
Goniada brunnea	5001280203																	
Harmothoe sp.	50010208																	
Heteromastus filobranchus	5001600203											1						1
Laonice cirrata	5001430201			1		1		1		2	1	1	1	3		2	2	1
Leitoscoloplos pugettensis	5001401601			2		3										1		
Lepidasthenia berkeleyae	5001021801	10		2		4		2		5		3		1		2		2
Levinsenia gracilis	5001410801	44		51		41		14		35		57		51		65	1	29
Lumbrineridae Indet.	500131																	
Lumbrineris cruzensis	5001310118																	
Lumbrineris sp.	50013101	2		3		2						1						2
Magelona sp.	50014401																	
Maldane sarsi	5001630301																	
Malmgreniella macginieti	50010226??			1														1
Malmgreniella sp.	50010226																	
Mediomastus sp.	50016004									2		2				1		
Nephtys caeca	5001250103																	
Nephtys cornuta	5001250104																	
Nephtys ferruginea	5001250111																	1
Nereis procera	5001240404	1			2	1			1			1	1		5		1	1

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE																		
Analyzed by Columbia Science																		
0-10 cm depth fraction and 1mm sieve																		
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1547	1547	1604	1604	1620	1620	1633	1633	926	926	1029	1029	1043	1043	1114	1114	1137
Station		AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB02	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03	AKB03
Replicate		Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E
Miscellaneous weight (gm)*	*adults and	0.1372		0.4502		0.3501		0.1275		0.2187		0.6423		0.1830		0.0795		0.2441
Mollusca weight (gm)*	juveniles	0.2983		0.1337		0.0850		0.1592		0.1189		0.1292		0.1418		0.1722		0.1486
Crustacea weight (gm)*	combined	0.1831		0.1359		0.1520		0.0908		0.2047		0.1470		0.3592		0.3346		0.7017
Polychaeta weight (gm)*		5.4010		2.9588		5.3878		1.1078		3.2146		2.2248		6.4771		1.7816		5.5644
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult
Notoproctus pacificus	5001630601	1		1		2												
Onuphis iridescens	5001290103		1	1		1		1				1					1	
Parandalia fauveli	5001220802																	
Paraprionospio pinnata	5001431701	3		3		1	1	1		1		1	2				5	
Pectinaria californiensis	5001660304	1		2		3	1	1	1	2	2	5		6				2
Pectinaria sp.	50016603																	
Pholoe glabra	5001060102							1				1				2		5
Pholoides aspera	5001040202																	
Phyllodoce groenlandica	5001130102																	
Phyllodoce hartmanae	5001131402								2									1
Phyllodoce sp.	50011314																	1
Phyllodocidae Indet.	500113																	
Pilargis berkeleyae	5001220301			1														
Pista agassizi	50016807??																	
Pista bansei	50016807??																	
Pista sp.	50016807																	
Pista wui	50016807??					1								1				1
Platynereis bicanaliculata	5001240501																	
Podarkeopsis glabra	5001211903			1						1				2		1		
Polycirrus sp.	50016808																	
Polynoidae sp. Indet.	500102																	
Praxillella pacifica	5001630906	11		3	4	8		1	5	9	1	2	1	3		4		4
Praxillella sp.	50016309																	
Prionospio (Minuspio) lighti	5001430521											1		1		2		
Prionospio(Minuspio)multibranchiata	5001433601	3																
Prionospio steenstrupi	5001430506			3		4		1		2				1		1		
Rhodine bitorquata	5001631001																	
Scalibregma californicum	50015701??																	
Scoletoma luti	5001310109					1		1		4				1		2		1
Scoloplos sp.	50014003																	
Sigambra nr. bassi	5001220204	2		8		2				11	1	4		12		16		9
Sphaerodoropsis sphaerulifer	5001260202					1												
Spiophanes berkeleyorum	5001431004	3		2		2		1				1		1				4
Sthenelais tertiaglabra	5001060305																	1
Sternaspis fossor	5001590102	1																
Streblosoma pacifica	50016825??																	
Syllis elongata	5001230308																	
Tenonia priops	5001022302	2				1		2		2		1						
Terebellides stroemi	5001690101															1		
Trochochaeta multisetosa	5001450203		1				1				2		5		1		3	
Notes:																		
No data-no weights																		
Plankton																		
Calanoida	6118																	
Hyperiid amphipods	617001																	
Other:																		
Nematoda	47	2		2								3						

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE												
Analyzed by Columbia Science												
0-10 cm depth fraction and 1mm sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1137	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		5.9316		8.3798		5.1966		0.8252		2.0605	
Mollusca weight (gm)*	juveniles		1.1700		0.7759		1.5056		0.8752		0.6011	
Crustacea weight (gm)*	combined		0.0819		0.1105		0.0634		0.1341		0.0638	
Polychaeta weight (gm)*			3.9305		2.3080		8.5341		4.3102		4.2504	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
MISCELLANEOUS												
Cnidaria Indet.												
Campanulariidae colony frag.	370401		1				1					
Cnidaria Indet.	37									1		
Halcampa decemtentaculata	3759040101				1						2	
Pachycerianthus fimbriatus	3743010303											
Peachia quinquecapitata	3759040201											
Pennatulacea	3754											
Stylatula elongata	3754010103		1		2		1		1		1	
Platyhelminthes												
Platyhelminthes Indet.	39											
Hirudinea												
Hirudinea Indet.	5012						1					
Nemertean	43											
Anopla	4301											
Cerebratulus californiensis	4303020208											
Heteronemertea	4303										2	
Nemertea Indet.	43										1	
Palaeonemertea	4302											
Tubulanidae	430201											
Tubulanus nothus	4302010108						1					
Tubulanus pellucidus	4302010104				2		1		2		1	
Tubulanus polymorphus	4302010102				3	2	1		2		3	
Echinoderm												
Amphiodia urtica/periercta	8129030199	1	15	2	3	1	3	1	6	3	11	7
Cucumaria piperata	8172060111				1							
Ophiura sp.	81270106			3						1		
Pentamera pseudocalcigera	8172060301											
Pentamera sp.	81720603			1								
Bryozoa												
Bowerbankia gracilis frag.	7805010201											
Bryozoa colony fragment	78											
Cheilostomata colony fragment	7814				1		1		1			
Ascidiacea												
Molgula sp.	84060301		1									
Echiura												
Arhynchite pugettensis	7301020105										1	
Sipuncula												
Thysanocardia nigra	7200020169											
MOLLUSCA												
Aplacophora Indet.												
Chaetoderma argenteum	5402010108						1		1		2	
Gastropoda												
Astyris gausapata	5105311		4	2	4	1	8	3	3			
Cephalaspidea Indet.	5110								1			
Cylichna attonsa	5110040205		1									
Cylichna sp.	51100402										1	
Epitonium sp.	51035001											

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE												
Analyzed by Columbia Science												
0-10 cm depth fraction and 1mm sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1137	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		5.9316		8.3798		5.1966		0.8252		2.0605	
Mollusca weight (gm)*	juveniles		1.1700		0.7759		1.5056		0.8752		0.6011	
Crustacea weight (gm)*	combined		0.0819		0.1105		0.0634		0.1341		0.0638	
Polychaeta weight (gm)*			3.9305		2.3080		8.5341		4.3102		4.2504	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Haminoea vesicula	5110120101								1			
Margarites pupillus	5102100308								1			
Muricidae Indet.	510501		1									
Nassarius mendicus	5105080101											
Odostomia sp.	51080101		1	1			1		1			
Olivella baetica	5105100102		1	4	2		1	3	2	1	2	4
Turbonilla sp.	51080102								2		2	
Bivalvia												
Axinopsida serricata	5515020201		24	1	21		11		24		32	
Bivalvia Indet.	55											
Chlamys hastata	5509050101			1								
Lucinoma annulatum	5515010201			1								3
Lyonsia californica	5520050202								1	1		
Macoma calcarea	5515310101								1			
Macoma carlottensis	5515310112		1									
Macoma sp.	55153101			3				2		4		5
Macoma yoldiformis	5515310111	1	1		1		2		1		1	
Modiolus sp.	55070106		1				1					
Pandora bilirata	5520020103											
Parvilucina tenuisculpta	5515010101	1	6	5	3	5	7	2	4	2		5
Rochefortia tumida	5515100102		4		2		11		6		2	
Tresus sp.	55152502									1		
Yoldia seminuda	5502040505			1		2		1		4		3
Nudibranch												
Corambe sp.	51310701				1							
Crustacea												
Ampelisca agassizi	6169020111		1									
Aoroides sp.	61690616											
Axiopsis spinulicauda	6183020402											
Cancer sp.	61880301			2								
Cylindroleberidae	611103											
Eudorella pacifica	6154040202											
Euphilomedes carcharodonta	6111070301		21		17		27		49		19	
Euphilomedes producta	6111070303		1						2		1	
Gammaropsis thompsoni	6169260401		2									
Heterophoxus affinis	6169420389											
Hippolytidae	617916											
Neotrypaea californiensis	6183040204									1		2
Pachynus cf. barnardi	6169343101											
Parametopella sp.	61694807				2		3					
Pinnixa occidentalis Cmplx	6189060403	2	6	3	6	2	1	2	10		4	
Pinnixa sp.	61890604											
Podoceropsis angustimana	1692605??		1									
Prachynella lodo	6169345701		1									
Protomedeia sp.	61692603		2		1				2		2	
Rhepoxynius boreovariatus	61694215??						1		2		1	
Polychaeta												
Amaeana sp.	50016823		1									

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE												
Analyzed by Columbia Science												
0-10 cm depth fraction and 1mm sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1137	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		5.9316		8.3798		5.1966		0.8252		2.0605	
Mollusca weight (gm)*	juveniles		1.1700		0.7759		1.5056		0.8752		0.6011	
Crustacea weight (gm)*	combined		0.0819		0.1105		0.0634		0.1341		0.0638	
Polychaeta weight (gm)*			3.9305		2.3080		8.5341		4.3102		4.2504	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Amage anops	5001670101											
Ampharete acutifrons	5001670208											
Ampharete finmarchica	5001670214											
Ampharete sp.	50016702											1
Aphelochaeta glandaria	50015003						1		1			
Aphelochaeta monilaris	5001500301										1	
Aphelochaeta sp.	50015003										1	
Aphrodita japonica	5001010101											
Aphrodita sp.	50010101											
Aricidea lopezi	5001411302											
Aricidea ramosa	5001410289											
Artacama coniferi	5001681101								1		2	
Brada villosa	5001540102											
Caulleriella sp.	50015002		1									
Chone sp.	50017001		1									
Cirratulidae	500150										1	
Cossura pygodactylata	5001520106											
Cossura spp.	50015201											
Diopatra ornata	5001290202		4				1		3			
Dipolydora socialis	5001430402		1		5		1		7		4	
Dipolydora sp.	50014304											
Errano bicirrata	5001310101											
Eteone longa	5001130205											
Eteone spetsbergensis	5001130202											
Eteone sp.	50011302											
Euclymeninae Indet.	5001631							1				
Eumida longicornuta	5001131108		1		1	1		1		1		1
Eunoe nr. senta	5001020504											
Glycera nana	5001270129	1		1	1	4				2		
Glycinde armigera	5001280103				1		1		1		3	
Goniada brunnea	5001280203											
Harmothoe sp.	50010208						1		1		1	
Heteromastus filobranchus	5001600203											
Laonice cirrata	5001430201											
Leitoscoloplos pugettensis	5001401601											
Lepidasthenia berkeleyae	5001021801		1		1		8		3			
Levinsenia gracilis	5001410801		4		11		12		5		6	
Lumbrineridae Indet.	500131				1							
Lumbrineris cruzensis	5001310118								4		1	
Lumbrineris sp.	50013101	1										
Magelona sp.	50014401											
Maldane sarsi	5001630301				1							
Malmgreniella macginieti	50010226??											
Malmgreniella sp.	50010226				1							
Mediomastus sp.	50016004								1		8	
Nephtys caeca	5001250103											
Nephtys cornuta	5001250104				2		2					
Nephtys ferruginea	5001250111				1							
Nereis procera	5001240404	1										

PSDDA ANDERSON KENTRON SITE BENTHIC INVERTE												
Analyzed by Columbia Science												
0-10 cm depth fraction and 1mm sieve												
Date		6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05	6/29/05
Time		1137	1330	1330	1346	1346	1414	1414	1442	1442	1504	1504
Station		AKB03	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07	AKB07
Replicate		Rep. E	Rep. A	Rep. A	Rep. B	Rep. B	Rep. C	Rep. C	Rep. D	Rep. D	Rep. E	Rep. E
Miscellaneous weight (gm)*	*adults and		5.9316		8.3798		5.1966		0.8252		2.0605	
Mollusca weight (gm)*	juveniles		1.1700		0.7759		1.5056		0.8752		0.6011	
Crustacea weight (gm)*	combined		0.0819		0.1105		0.0634		0.1341		0.0638	
Polychaeta weight (gm)*			3.9305		2.3080		8.5341		4.3102		4.2504	
Taxa	**NODC Code**	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number	Number
		Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile	Adult	Juvenile
Notoproctus pacificus	5001630601						1					
Onuphis iridescens	5001290103			1			1		2		1	
Parandalia fauveli	5001220802		2									
Paraprionospio pinnata	5001431701	1			4		2					
Pectinaria californiensis	5001660304		1	1	3		2		2		2	3
Pectinaria sp.	50016603											
Pholoe glabra	5001060102											
Pholoides aspera	5001040202		3						1			
Phyllodoce groenlandica	5001130102								1			
Phyllodoce hartmanae	5001131402											
Phyllodoce sp.	50011314											
Phyllodocidae Indet.	500113											
Pilargis berkeleyae	5001220301		1		1		1					
Pista agassizi	50016807??											
Pista bansei	50016807??						1					
Pista sp.	50016807											1
Pista wui	50016807??										1	
Platynereis bicanaliculata	5001240501								1	1		
Podarkeopsis glabra	5001211903		2		1		1				1	
Polycirrus sp.	50016808						1		1			
Polynoidae sp. Indet.	500102											
Praxillella pacifica	5001630906		2		3		8	1	2	1	1	
Praxillella sp.	50016309											
Prionospio (Minuspio) lighti	5001430521				2		2		1			
Prionospio(Minuspio)multibranchiata	5001433601											
Prionospio steenstrupi	5001430506		8		1		5		4		8	
Rhodine bitorquata	5001631001											
Scalibregma californicum	50015701??								1			
Scoletoma luti	5001310109										1	
Scoloplos sp.	50014003											
Sigambra nr. bassi	5001220204		1		6		4		3		2	
Sphaerodoropsis sphaerulifer	5001260202											
Spiophanes berkeleyorum	5001431004		1		3							
Sthenelais tertiaglabra	5001060305											
Sternaspis fossor	5001590102											
Streblosoma pacifica	50016825??						1					
Syllis elongata	5001230308						2					
Tenonia priops	5001022302		1		2		1		2		1	
Terebellides stroemi	5001690101											
Trochochaeta multisetosa	5001450203	1	1		1	1	1	5				2
Notes:												
No data-no weights												
Plankton												
Calanoida	6118											
Hyperiid amphipods	617001											
Other:												
Nematoda	47						2		5		3	

QA/QC Report

Cænum **Environmental Associates**

DATA VALIDATION REPORT: BENTHIC INFAUNA ANALYSES
ANDERSON KETRON ISLAND DISPOSAL SITE

July 8, 2006

Prepared For
Scientific Applications International Corporation
Environmental Sciences Division
And
The Washington State Department of Natural Resources:
Division of Aquatic Lands

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INTRODUCTION

Benthic infauna samples were collected as part of the 2005 full monitoring event at the Anderson Ketron Island Dredged Material Disposal site. Three transect (AKT-01, AKT-02 and AKT-03), and three benchmark (AKB-01, AKB-02 and AKB-03) stations were sampled to characterize the benthic community at the disposal site. The objective of the benthic survey was to determine whether the dredged material had affected the benthic communities in the area surrounding the disposal site.

SUMMARY OF DATA QUALITY

The sampling and analysis of benthic infauna assemblages at the Anderson Ketron Island Disposal Site followed the recommended Puget Sound Estuary Program protocols and guidelines and the Anderson Ketron Island Full Monitoring Event Sampling and Analysis, and Quality Assurance Project Plans (SAP, QAPP; PSEP 1987, SAIC 2005). Mr. Peter Striplin of Caenum Environmental Associates was the Benthic Infauna QA Manager, he reviewed QA/QC procedures and he determined that there were no significant problems with data quality. The results can be used for their intended purposes without qualification.

SAMPLE COLLECTION, TRANSPORT, AND CHAIN OF CUSTODY

Samples were collected from six stations for benthic community analysis over a consecutive three-day period from June 29 and June 30, 2005. Five replicate grab samples were collected at each station for a total of 30 samples. All grab samples were collected using a 0.06 m^2 Gray O'Hara box core sampler. On completion of deployment and retrieval of the grab sampler the sediment surface was inspected to determine sample acceptability. Samples were rejected if there was severe leakage, if the sediment surface was unevenly distributed in the sampler, or if the sediment was disturbed in any way. When a sample was deemed acceptable several qualitative sediment characteristics (e.g., sediment texture and color, presence, type and strength of odors, grab penetration depth, approximated redox depth) were entered into the field log.

Sediment from each replicate box core sample was divided into two sections: the top 10 cm and the remaining sediment in the box core deeper than 10 cm. The top 10 cm section was gently sieved through a stacked set of 1.0 mm and 0.5 mm mesh screens using site water. The >10 cm section was gently sieved through a 1.0 mm sieve. Samples were fixed with a formaldehyde solution and transported to the laboratory for processing. The formaldehyde solution was rinsed from the benthic infaunal samples by the staff at SAIC on July 22, 2003. The samples were preserved in a 70 percent ethanol solution for long-term storage.

Benthic infaunal samples were shipped to Ms. Sandy Lipovski of Columbia Science in Royston, B.C., Canada, for processing.

The top 10 cm fraction at the Transect stations was processed, analyzed and reported on (SAIC 2005), while the Benchmark station samples, the > 10 cm, and the 0.5 mm mesh samples were initially archived. The results from the top 10 cm fraction at the Transect stations indicated that the abundance of arthropods was statistically significantly reduced from the abundances found during the Baseline Survey conducted in 1989. As a result the Department of Natural Resources and the DMMP decided to process the samples from the Benchmark stations, the > 10 cm fraction, and the samples collected on the 0.5 mm mesh sieve. This QA/QC report examines the processing of those samples.

LABORATORY ANALYSES

Project personnel who sorted and identified the samples are identified Table 1. Planktonic and colonial organisms that were found in the samples were enumerated but not used in the analysis. Samples were sorted into the following major phyla: Polychaeta, Crustacea, Mollusca, Echinodermata, and miscellaneous phyla. These were then identified to the lowest taxonomic level possible. At least one specimen from each species was placed in a verified voucher collection.

QUALITY ASSURANCE/QUALITY CONTROL

Quality control (QC) checks of sample sorting were accomplished by completely resorting all samples collected from all stations. Results from the quality control check indicated that no additional samples needed to be resorted due to QC failure (Appendix G-1).

After samples were sorted and had passed the QC check, the remaining detrital material with the organisms removed was placed into the labeled sample jar and the lid was taped shut to prevent evaporation of the ethanol. The samples are currently being archived at the office of Columbia Sciences.

Quality control checks of the taxonomic identifications were performed by re-identifying and enumerating samples of each taxonomic group by the QC taxonomic experts and by having those same expert taxonomists verify the reference voucher collection (Appendix G-2 to G-4). Quality control checks of the taxonomic identifications were performed by the following: Polychaeta – Hiroki Tomoe (Appendix G-2), Crustacea – Phil Hoover (Appendix G-3), Mollusca – Jacquie Taylor, Echinodermata, and Miscellaneous Phyla – Val Macdonald (Appendix G-4). If discrepancies arose between the primary and QC taxonomist, the species in question were examined closely by both taxonomists and a joint decision was reached as to the species name.

A summary listing changes to the taxonomic identification of the samples as a result of the QA/QC is presented in Table 2. These changes were incorporated into the data by Columbia Sciences prior to submitting the data package to Caenum Environmental Associates.

The data from the taxonomist's original laboratory bench sheets were entered onto electronic spreadsheets. Data entry was verified by spot-checking 10 percent of the spreadsheet data to the laboratory bench sheets.

Overall, the QA/QC procedures indicated there were no significant problems with data quality. The results can be used for their intended purposes without qualification.

Table 1. List of personnel that sorted and identified the benthic infaunal samples for the Anderson Ketron Island monitoring event.

Sample Sorting	Sample Identification
Evan Lipovski	Sandy Lipovsky - Polychaeta, Crustacea, Mollusca, Echinodermata and Miscellaneous Phyla Hiroki Tomoe - Polychaeta QC Jacquie Taylor - Mollusca Val Macdonald - Echinodermata and Miscellaneous Phyla QC Phil Hoover - Crustacea QC

Table 2. List of taxonomic corrections to the data set based on the QA/QC results

Station	Original Identification	Final Identification
	Polychaeta	
AKB-02	*Aphrodita japonica*	*Aphrodita japonica*
AKB-07	*Glycera robusta*	*Glycera robusta*
AKB-02	*Nephtys assignis or rickettsii*	*Nephtys assignis*
AKB-07	*Mesochaetopterus taylori*	*Mesochaetopterus taylori*
AKB-07	*Syllidae*	*Proceraea cornuta*
AKB-02	*Polynoidae*	*Hesperonoe* spp.

APPENDIX 1

SAMPLE SORTING QA REPORT

1. **Benchmark Stations: 0- 10 cm, 1.0 mm mesh sieve**
2. **Benchmark Stations: 0- 10 cm, 0.5 mm mesh sieve**
3. **Transect and Benchmark Stations: >10 cm Fraction**

APPENDIX 1-1

2005 PSDDA Anderson Ketron Site
SORTING QA REPORT: 0-10cm depth and 1.0 mm fraction

For SAIC
By Columbia Science
Monday, April 17, 2006
Note: Planktonic copepods and hyperiid amphipods not included in data or weights
Missorts for QA calculations and not added into the data
QA on 100% of residue

Station	Rep	Polys	# of Missorts	Moll	# of Missorts	Crust	# of Missorts	Misc	# of Missorts	Total # of Org	Total # of Missorts	Sorter	QA Sorter	Pass/ No-Pass
														sort %
AKB02	A	61	0	32	1	60	0	31	0	185	1	EJL	SJL	99
	B	92	1	23	0	53	1	16	0	186	2	EJL	SJL	99
	C	101	0	32	0	52	1	28	1	215	2	EJL	SJL	99
	D	90	0	29	0	53	0	31	0	203	0	EJL	SJL	100
	E	41	0	17	0	49	0	18	0	125	0	EJL	SJL	100
AKB03	A	92	2	24	2	34	1	12	0	167	5	EJL	SJL	97
	B	98	2	15	0	46	0	16	0	177	2	EJL	SJL	99
	C	100	2	8	0	53	0	8	0	170	2	EJL	SJL	99
	D	122	1	19	0	40	2	18	0	202	3	EJL	SJL	98
	E	76	1	9	0	49	1	10	0	146	2	EJL	SJL	99
AKB07	A	40	1	64	1	40	0	24	0	170	2	EJL	SJL	99
	B	59	0	34	0	28	0	17	0	138	0	EJL	SJL	100
	C	69	1	54	0	32	0	10	0	166	1	EJL	SJL	99
	D	52	1	62	0	66	1	18	1	201	3	EJL	SJL	99
	E	54	0	62	0	29	1	29	0	175	1	EJL	SJL	99

APPENDIX 1-2

2005 PSDDA Anderson Ketron Site
SORTING QA REPORT: 0-10cm depth and 0.5mm fraction
For SAIC
By Columbia Science
Monday, April 17, 2006
Note: Planktonic copepods and hyperiid amphipods not included in data or weights
Missorts for QA calculations and not added into the data
QA on 100% of residue

STATION	REP	POLYS	# of MISSORTS	MOLL	# of MISSORTS	CRUST	# of MISSORTS	MISC	# of MISSORTS	TOTAL Number plus Missorts	TOTAL # of MISSORTS	SORTER	QA SORTER	PASS / NO-PASS
														sort %
AKB02	A	261	3	270	3	100	0	43	0	680	6	EJL	SJL	99
	B	327	4	213	4	92	2	57	0	699	10	EJL	SJL	99
	C	519	4	255	5	159	0	60	0	1002	9	EJL	SJL	99
	D	369	2	177	2	82	3	48	1	684	8	EJL	SJL	99
	E	392	5	215	1	120	1	49	1	784	8	EJL	SJL	99
AKB03	A	461	6	163	1	43	0	28	0	702	7	EJL	SJL	99
	B	191	4	41	2	49	0	19	0	306	6	EJL	SJL	98
	C	573	8	147	3	62	0	48	0	841	11	EJL	SJL	99
	D	465	7	106	2	53	0	34	0	667	9	EJL	SJL	99
	E	612	5	179	2	49	0	53	0	900	7	EJL	SJL	99
AKB07	A	319	7	150	0	60	1	49	1	587	9	EJL	SJL	98
	B	280	3	168	3	74	3	43	0	574	9	EJL	SJL	98
	C	284	3	146	2	69	1	44	0	549	6	EJL	SJL	99
	D	370	4	150	3	98	1	55	0	681	8	EJL	SJL	99
	E	452	6	197	1	57	0	76	2	791	9	EJL	SJL	99
AKT01	A	208	8	323	3	11	0	10	0	563	11	EJL	SJL	98
	B	417	5	514	3	80	0	25	0	1044	8	EJL	SJL	99
	C	168	5	463	5	18	0	14	0	673	10	EJL	SJL	98
	D	223	1	349	9	12	0	16	0	610	10	EJL	SJL	98
	E	234	4	420	5	8	0	9	0	680	9	EJL	SJL	99
AKT02	A	211	2	358	4	25	0	19	0	619	6	EJL	SJL	99
	B	231	2	230	4	148	0	8	0	623	6	EJL	SJL	99
	C	342	4	398	4	138	0	14	0	900	8	EJL	SJL	99
	D	140	1	260	6	34	0	15	0	456	7	EJL	SJL	98
	E	215	2	250	4	16	1	13	1	502	8	EJL	SJL	98
AKT03	A	179	0	198	0	20	0	22	0	419	0	EJL	SJL	100
	B	333	4	200	4	53	0	18	0	612	8	EJL	SJL	99
	C	394	3	171	5	37	0	23	0	633	8	EJL	SJL	99
	D	398	5	186	1	49	0	14	0	653	6	EJL	SJL	99
	E	526	9	288	0	47	0	40	0	910	9	EJL	SJL	99

APPENDIX 1-3

2005 PSDDA Anderson Ketron Site
SORTING QA REPORT: >10cm depth and 1.0 mm fraction

For SAIC: By Columbia Science
Monday, April 17, 2006
Note: Planktonic copepods and hyperiid amphipods not included in data or weights
Missorts for QA calculations and not added into the data
QA on 100% of residue

Station	Rep	Polys	# of Missorts	Moll	# of Missorts	Crust	# of Missorts	Misc	# of Missorts	Total # of Org	Total # of Missorts	Sorter	QA Sorter	Pass/ No-Pass
AKB02	A	18	0	2	0	13	0	5	0	38	0	EJL	SJL	100
	B	15	0	3	0	3	0	2	0	23	0	EJL	SJL	100
	C	19	0	3	0	5	0	0	0	27	0	EJL	SJL	100
	D	18	0	0	0	3	0	0	0	21	0	EJL	SJL	100
	E	16	1	5	0	5	0	6	0	33	1	EJL	SJL	97
AKB03	A	47	1	4	0	6	0	3	0	61	1	EJL	SJL	98
	B	33	0	1	0	4	0	5	0	43	0	EJL	SJL	100
	C	52	1	1	0	4	0	2	0	60	0	EJL	SJL	98
	D	73	3	2	0	4	0	2	0	84	3	EJL	SJL	96
	E	30	1	5	0	5	0	3	0	44	1	EJL	SJL	98
AKB07	A	33	1	7	0	6	0	7	0	54	1	EJL	SJL	98
	B	21	0	3	0	2	0	3	0	29	0	EJL	SJL	100
	C	7	0	4	0	3	0	2	0	16	0	EJL	SJL	100
	D	25	0	6	0	3	0	5	0	39	0	EJL	SJL	100
	E	49	0	7	0	10	0	12	0	78	0	EJL	SJL	100
AKT01	A	16	2	6	0	2	0	0	0	24	2	EJL	SJL	92
Re-sort	A	18	0	6	0	2	0	0	0	26	0	SJL	SJL	100
	B	25	1	1	0	1	1	4	0	33	2	EJL	SJL	94
Re-sort	B	26	0	1	0	1	0	4	0	35	0	SJL	SJL	100
	C	16	0	0	0	1	1	0	0	18	1	EJL	SJL	94
Re-sort	C	16	0	0	0	2	0	0	0	18	0	SJL	SJL	100
	D	15	0	0	0	1	1	0	0	17	1	EJL	SJL	94
Re-sort	D	15	0	0	0	2	0	0	0	18	0	SJL	SJL	100
	E	11	0	0	0	3	0	2	0	16	0	EJL	SJL	100
AKT02	A	29	0	3	0	4	0	3	0	39	0	EJL	SJL	100
	B	22	1	4	0	1	0	1	0	29	1	EJL	SJL	97
	C	25	0	1	0	3	0	4	0	33	0	EJL	SJL	100
	D	18	0	0	0	1	0	3	0	22	0	EJL	SJL	100
	E	20	0	2	0	0	0	1	0	23	0	EJL	SJL	100
AKT03	A	31	1	4	0	4	0	4	0	44	1	EJL	SJL	98
	B	22	1	2	0	4	0	2	0	31	1	EJL	SJL	97
	C	24	0	4	0	4	0	1	0	33	0	EJL	SJL	100
	D	13	0	5	0	3	0	3	0	24	0	EJL	SJL	100
	E	15	0	5	0	5	0	4	0	29	0	EJL	SJL	100

APPENDIX 2

TAXONOMIC CORRECTIONS BASED UPON QA RESULTS

APPENDIX 2
TAXONOMIC CORRECTIONS BASED UPON QA RESULTS

Original Taxonomy: Columbia Science-Sandy J Lipovsky
PROJECT: Anderson/Ketron 2005 Survey--Second Data Set (2006)
Verification By: Biologica Environmental Services, LTD
Biological Taxonomists: Val Macdonald/Hiroki

STATION	REP	TAXA Original ID	Biologica Comments
AKB02	E	Aphrodita japonica	ID confirmed
AKB07	A	Glycera robusta	ID confirmed
AKB02	D	Nephtys assignis or rickettsii	Nephtys assignis--tough ID
AKB07	A	Mesochaetopterus taylori	ID confirmed
AKB07	A	Syllidae	Proceraea cornuta
AKB02	E	Polynoidae--Hesperonoe or Arctonoe	Hesperonoe sp. Not fully developed

APPENDIX 3

TAXONOMIC NOTES

1. **Benchmark Stations: 0- 10 cm, >10 cm, 1.0 mm mesh sieve**
2. **Benchmark Stations: 0- 10 cm, 0.5 mm mesh sieve**
3. **Notes for NODC Coding 0.5 mm Sieve**

APPENDIX 3-1

NOTES TO DATA
ANDERSON KETRON
0-10 CM, >10 cm, 1.0 mm FRACTION

For both, it is interesting to note that Lepidasthenia berkeleyae has been reported as commensal in the thick mud tubes of Praxillella pacifica and this is certainly what I observed with these samples.

Lumbrineridae and Lumbrineris sp. are those polychaetes where too many of the diagnostic hooks were broken to take the identifications further.

The spreadsheet for the 0-10 cm 1mm data has some rows highlighted in yellow. These are the new additions to the earlier spreadsheet. I didn't know if you were adding to the earlier data or using the new, combined submission from me. If you are using this submission from me, you can make all the rows "no fill".

The following were coded to genus because I could not find a suitable NODC code to species:

Streblosoma pacifica
Scalibregma californicum
Pista agassizi
Pista bansei
Podoceropsis angustimana
Rhepoxynius boreovariatus
Aphelochaeta glandaria
Malmgreniella macginieti

FYI—Neotrypaea californiensis is the new name for Callianassa californiensis

APPENDIX 3-2

Notes to data
Anderson Ketron Island
0-10 cm 0.5mm fraction

1. Oligochaetes were kept separate from polychaetes and the weights also as a separate group. You could add the weights to "others" if you think that is the appropriate place---I kept them separate since they are not technically polychaetes.

2. I got a late night bright idea to make the 0.5mm taxa list the master list for all of the data combined and all depths and sieve sizes. If you don't like this or it is confusing then let me know and I will revise the taxa list to reflect the 0-10 cm depth and the 1mm and 0.5mm fractions combined only.

3. The rows highlighted in yellow are those taxa that were not listed for the 0-10cm 1mm or the greater than 10 cm 1mm spreadsheets. Many of these are not new species but rather raising the level of ID because the inverts were small and not always possible to take to species, even though they are likely the same. For example, the juvenile sipunculids I listed as Golfingiidae but they could very well be Thysanocardia nigra. I just didn't want to make assumptions.

4. The bivalves were the most difficult because they were VERY small and also the shells were mostly or entirely dissolved—not uncommon given the fragility of the shells and the effects of the preservative. I ID'd those for which I could recognize an internal structure and put the rest as Bivalvia Indet. However, some of those could be juveniles of items on the taxa list—they were just too small to ID. It might be interesting to run the analysis and then combine all of the bivalve juveniles (NODC code 55XXXXXXX) out of curiosity.

5. Sample AKB03-B was anomalous. The amount of sediment was many times that of the other four reps and the sediment was fine sand whereas it was fine vegetative/woody material in the other four reps. The reduced numbers of invertebrates reflects the difference in substrate.

6. AKT02 B and C had more crustaceans than the other 3 reps---the sampler could have hit a "cloud" of these amphipods (Parametopella sp.)

7. I grouped the small bivalve juveniles of what are possibly Yoldia and Ennucula into Nuculoidea. I could see enough internal structure to go this far but did not want to take them to genus or species and each is in a different family.

8. I listed Chaetoderma sp. for the Aplacophoran. The samples with adults were Chaetoderma argenteum but I did not want to assume anything.

9. AKB02-A had fewer juvenile Pectinaria californiensis that the other four reps. This looked strange so I went back and re-checked the vials of ID'd organisms as well as the sorted residue as back-up that the numbers were correct, which they were.

Appendix 3-3

Notes For NODC Coding 0.5 mm Sieve

1. Solamen columbianum was coded for Megacrenella columbiana—the former name

2. Americhelidium shoemakeri was coded for Synchelidium shoemakeri—the former name

3. Poecillostomatoida was coded for Cyclopoida—this was split into Cyclopoida and Poecillostomatoida but did not find a code for the latter

4. Prionospio jubata—could not find a code and I believe there was just one so you could code for Prionospio sp. if you want