



Rocky Intertidal Community Monitoring at Channel Islands National Park

2004 Annual Report

Natural Resource Data Series NPS/CHIS/NRDS—2010/064



ON THE COVER

Surfgrass and algae at Northwest-Talcott, Santa Rosa Island
Photograph by: Paula Rich

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Executive Summary

Channel Islands National Park includes the five northern islands off the coast of southern California and the surrounding waters out one nautical mile. There is approximately 176 miles of coastline around the islands and most of it is rocky. The diversity and undisturbed nature of the tidepools of this rocky coastline was recognized as a special feature of the islands in the enabling legislation. In order to gain information to conserve these communities unimpaired for future generations, the NPS has been monitoring the rocky intertidal at the islands since 1982. This report summarizes the 2004 sampling year efforts (from March 2004 to January 2005) and findings of the Channel Islands National Park (CINP) Rocky Intertidal Monitoring Program.

Specific monitoring objectives are: 1) to determine the long-term trends in percent cover of key sessile organisms in the rocky intertidal ecosystem (Table 1), 2) to determine population dynamics of *Haliotis cracherodii*, *Lottia gigantea*, and *Pisaster ochraceus*. Objectives are met by monitoring percent cover of core species in target intertidal zones using photoplots and transects, monitoring species composition and abundance of motile invertebrates using photoplots, measuring size frequency and abundance of black abalone, owl limpets, and seastars using fixed plots or timed searches.

Thirteen key species or species groups are monitored twice per year at 21 sites on the five park islands (Figure 1) as part of the Rocky Intertidal Monitoring Program. Fixed photoplots were used to monitor the percent cover of thatched and acorn barnacles (*Tetraclita rubescens*, *Balanus glandula*/*Chthamalus* spp.), mussels (*Mytilus californianus*), rockweeds (*Silvetia compressa*, and *Hesperophycus californicus*), turfweed (*Endocladia muricata*), red algal turf (*Pterocladia* spp. and *Gelidium* spp.), goose barnacles (*Pollicipes polymerus*), and tar. Point-intercept transects are used to determine the percent cover of surfgrass (*Phyllospadix* spp.). Information about the size distribution (i.e. “size-frequency” data) is collected for owl limpets (*Lottia gigantea*) in circular plots. Size distribution and relative abundance of black abalone (*Haliotis cracherodii*) and ochre sea stars (*Pisaster ochraceus*) is determined using timed searches. Shorebirds and pinnipeds were counted at each site. Visitor numbers for the Anacapa tidepools were reported by the concession boats and are presented here.

Sites were established between 1982 and 1994. Site selection considered visitation, accessibility, presence of representative organisms, wildlife disturbance, and safety. The monitoring protocol is detailed in Richards and Davis (1988). Additional protocol for Santa Cruz Island is detailed in Engle *et al.* (1998). Updated protocol summaries can be found in Richards and Lerma (2000), and Richards *et al.* (2009).

During the 2004 sampling season, we monitored most of the 21 sites in both spring and fall but due to logistical problems, some of the Anacapa Island sites were not monitored in the spring. We did not visit Orizaba Cove on Santa Cruz Island in 2004 due to logistical issues. To avoid disturbing nesting California brown pelicans, we only monitored the Santa Barbara Island sites in the fall. Weather conditions were generally unfavorable in the spring with high winds and rain. Conditions did limit some sampling efforts, particularly the abalone and seastar searches.

We used digital cameras for all photos taken in 2004. Photoplots were either scored in the field or from digital images on the computer with grids digitally overlaid. We saw some *Mytilus californianus* recovery especially at Prisoners Harbor where dense mussels filled in the bare rock which dominated plots in 2003. Mussel plots at Anacapa were also above average cover. *Hesperophycus californicus* cover was low in 2004 but *Silvetia compressa* cover was near average or only slightly below. *Chthamalus/Balanus* and *Endocladia muricata* both had typical years.

Only two black abalone, *Haliotis cracherodii*, were found in fixed monitoring plots, both at Otter Harbor. Otter Harbor, Harris Point and Ford Point were the only sites with more than 10 abalone found during 30-minute searches. No abalone smaller than 50 mm were found. No symptoms of Withering Syndrome were seen. Black abalone population levels at the islands remain at less than one percent of 1985 population levels.

Ochre seastars, *Pisaster ochraceus*, were especially abundant at Johnsons Lee, Ford Point, and Willows Anchorage with up to 413, 514, and 671 counted during 30-minute searches, respectively, at those sites. Moderate numbers of *P. ochraceus* were seen at Sea Lion Rookery, Landing Cove, Scorpion Rock, Trailer, Fossil Reef, East Point, and Cuyler Harbor. At Sea Lion Rookery, most of the *P. ochraceus* were under 50 mm.

Giant owl limpets, *Lottia gigantea*, ranged in density from a mean of 3.4 m⁻² at Santa Cruz Island to 10.2 m⁻² at San Miguel. Mean sizes ranged from 33 mm at Anacapa to 54 mm at Santa Rosa. The largest *L. gigantea* measured was 108 mm at Northwest-Talcott.

Phyllospadix spp. were monitored at four sites. All transects had at least 50% *Phyllospadix* cover except one transect at Fraser Cove. There has been little change over the years except for an increase in cover in transect 3 at Northwest-Talcott.

Black oystercatchers were the most common shorebird and were seen at all sites except Prisoners Harbor. The greatest number of black oystercatchers seen at one time was 37 at Fossil Reef. American oystercatchers were seen at three different sites in the spring. Black turnstones were fairly common at 8 sites in the spring and 6 in the fall. Harbor seals were present near or at several sites but were most numerous at Otter Harbor in both spring and fall. California sea lions were numerous at both Santa Barbara Island sites.

South Frenchy's Cove is the most visited rocky intertidal area at the park, due to proximity to the mainland and relative ease of access. In 2004, Island Packers Company ran 30 trips to Frenchy's Cove, Anacapa to visit the tidepools. Total visitation was 2,275 passengers. Most visitation (67%) occurred during the months of February through May. March was the busiest month with 847 visitors.

Acknowledgments

The National Park Service, Channel Islands National Park (CINP) funded this program. California Department of Fish and Game and Channel Islands National Marine Sanctuary (CINMS) provided staff time and general assistance on several events. Boat time (four days in spring and four in fall) was provided by CINMS. Temperature loggers were provided by the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) Marine Science Institute, University of California, Santa Barbara (UCSB), who maintained the data.

As with any large project there are many people “behind the scenes” that make it possible to actually conduct the work. We are indebted to the administrative clerks, dispatchers, boat operators, maintenance workers, and rangers of Channel Islands National Park that help with the day to day operations.

Special thanks to the Channel Islands National Marine Sanctuary (CINMS) provided boat time and staff assistance with the monitoring. This work was performed in part at the University of California Natural Reserve System, Santa Cruz Island Reserve on property owned and managed by The Nature Conservancy. Thanks to Dr. Lyndal Laughrin and staff at the UC reserve field station for their assistance. Thanks also to Carol Blanchette, Haven Livingston, and others from the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) Marine Science Institute, University of California, Santa Barbara (UCSB) and UC Santa Cruz (UCSC) for their collaboration

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Introduction

The rocky intertidal zone is a compact and diverse area between marine and terrestrial habitats. Marine organisms living within this zone are highly adapted to physical disturbance and severe temperature fluctuations and are subject to both marine and terrestrial predators. The intense pressure from both physical and biological entities has promoted highly diverse invertebrate and algal assemblages within the rocky intertidal zone. In fact, many organisms are so well adapted to this habitat that they cannot live without the alternating exposure to both the air and sea.

Channel Islands National Park (CINP) and National Marine Sanctuary (CINMS) encompass the four northern Channel Islands and Santa Barbara Island off the coast of Southern California. The park islands and surrounding waters bear the designation of an International Biosphere Reserve and State of California Areas of Special Biological Significance. The State of California maintains jurisdiction over the marine resources and manages them through the California Department of Fish and Game. In 2003, a network of marine reserves was established around the Channel Islands. Four of the Rocky Intertidal monitoring sites fall inside Marine Reserves and two more are right near reserve boundaries (Figure 1).

The “undisturbed tide pools” are unique features specifically mentioned in the enabling legislation for Channel Islands National Park. The law establishing the park (16-USC-410) also mandated the development of inventories and monitoring of natural resources in the park. Rocky intertidal monitoring began in 1982 with the following goals: 1) to monitor trends in population dynamics of selected indicator organisms, 2) to determine normal limits of variation, 3) to discover abnormal conditions, 4) to provide remedies for management problems, and 5) to measure the success of management actions.

Specific monitoring objectives are: 1) to determine the long-term trends in percent cover of key sessile organisms in the rocky intertidal ecosystem (Table 1), 2) to determine population dynamics of *Haliotis cracherodii*, *Lottia gigantea*, and *Pisaster ochraceus*. Objectives are met by monitoring percent cover of core species in target intertidal zones using photoplots and transects, monitoring species composition and abundance of motile invertebrates using photoplots, measuring size frequency and abundance of black abalone, owl limpets, and seastars using fixed plots or timed searches. Monitoring is done twice each year during spring and fall to monitor the effects of winter storms and summer warm water.

Rocky intertidal monitoring began at Anacapa Island (VTN, Oregon 1984) initially with an emphasis on monitoring trampling effects, based on concerns for visitor impacts (Littler 1978). The program was expanded in 1985 to include the other park islands and to look more broadly at the ecology and possible impacts in other areas. Impacts from harvest, oil spills, and climate change may be of particular interest as future management concerns. Fixed plots are used to minimize natural variance.

Channel Islands National Park Rocky Intertidal Monitoring is part of a government and non-government consortium called the Multi-Agency Rocky Intertidal Network (MARINe) (Dunaway et al. 1998). Within MARINe, we are working to standardize collection of data and make it available to member groups in a centralized database. Within the MARINe network,

there are sites from San Diego to northern California, including the Channel Islands. By working with MARINe we will have access to consistent data that can be used for a much broader regional analysis of changes to the intertidal communities.

This report summarizes the 2004 sampling year efforts (from March 2004 to January 2005) and documents activities and observations of the CINP Rocky Intertidal Monitoring Program. Monitoring results were previously reported in Richards 1986, 1988, 1998, Richards and Lerma 2000, 2002 2005a, 2005b, Richards et al. 2010, and Richards and Rich 2009. Additional black abalone monitoring results have been presented in Haaker et al. 1992, Davis et al. 1992, and Richards and Davis 1993.

Methods

Study Area

The California Channel Islands are comprised of eight islands in the Southern California Bight, five of which are within the Channel Islands National Park. The five park islands have about 323 kilometers (176 miles) of coastline, the majority of which is rocky shore. Rock types vary from hard weathered volcanic basalt or breccias to easily eroded Monterey shale and sandstone. Sites were originally established to include the various exposures and rock types of each of the islands, though broad rocky benches were targeted.

The park islands span the transition zone between cooler waters of the Oregonian biogeographic province and the warmer Californian waters from the south. Mean annual air temperature along the mainland in this area is 15°C. Mean rainfall in about 38 cm per year (Daily et al. 1993). There is a gradient across the island chain with San Miguel Island having the most precipitation, most cloud cover, and most wind. Santa Barbara Island to the southeast is the warmest and driest. The mean monthly sea temperatures range from 13°C in April at San Miguel Island to nearly 20°C at Santa Barbara Island in August and September (Engle and Richards 2001). Swell varies through the year with winter storms bringing high northwest wind and waves during the winter and spring, and distant southern hemisphere storms sending large swells to the south facing shores in summer.

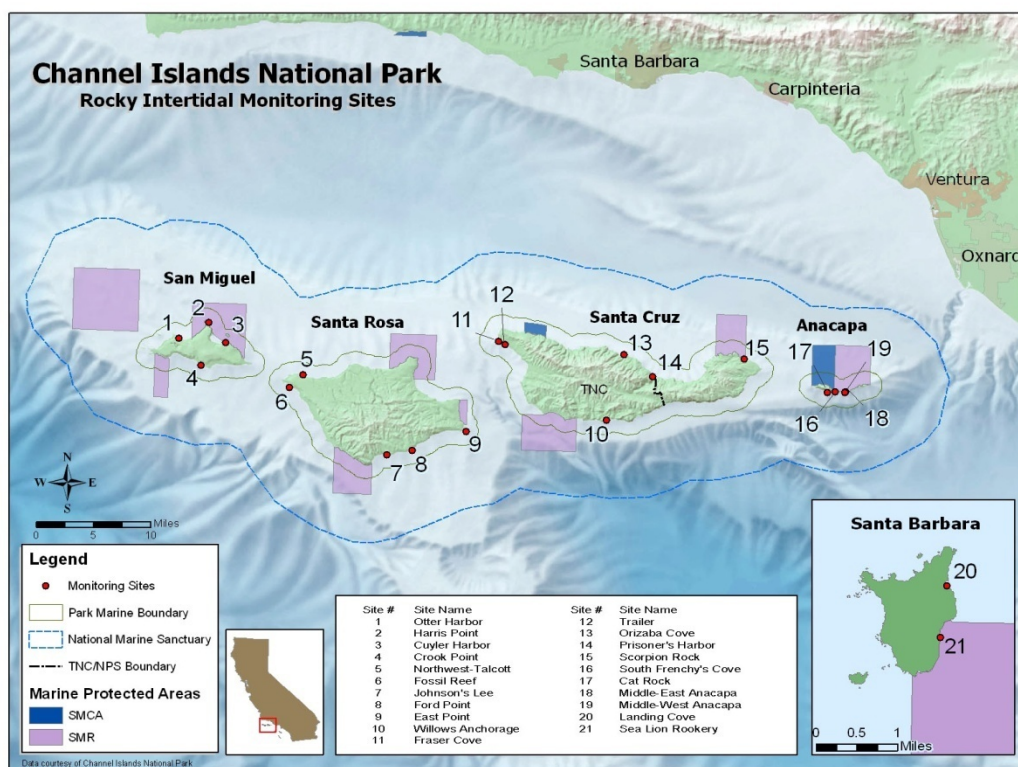


Figure 1. Rocky intertidal community monitoring site locations in Channel Islands National Park.

Monitoring

The Channel Islands National Park Rocky Intertidal Monitoring Program has 21 sites on the five park islands (Figure 1). Sites were established between 1982 and 1994. Site selection considered visitation, accessibility, presence of representative organisms, wildlife disturbance, and safety. Sampling is usually conducted twice each year, in spring and fall. In 2004, sites were monitored in spring (March-June) and fall (Oct.-Jan. 2005). The monitoring protocol is detailed in Richards and Davis (1988). Additional protocol for Santa Cruz Island is detailed in Engle *et al.* (1998). Updated protocol summaries can be found in Richards and Lerma (2000), and Richards *et al.* (2010). Also see Engle (2005) for updated MARINE protocols. See Appendix A for additional notes about the 2004 program.

Data are maintained in Microsoft Access and Excel files at Channel Islands National Park. The data (including trip reports, annual reports, and the database) reside within the CINP network.

Thirteen core species or species groups are targeted for monitoring in fixed photoplots to determine percent cover (Table 1). These target species are often common and are generally used to define a band or zone within the intertidal zone. Target species include thatched and acorn barnacles (*Tetraclita rubescens*, *Balanus glandula*/*Chthamalus* spp.), mussels (*Mytilus californianus*), rockweeds (*Silvetia compressa*, and *Hesperophycus californicus*), turfweed (*Endocladia muricata*), red algal turf (*Pterocladia* spp. and *Gelidium* spp.), goose (or leaf) barnacles (*Pollicipes polymerus*), and tar which occurs naturally from oil seeps in the channel and can form a thick persistent cover over the substrate. An additional 32 taxa or substrates are also monitored when present (see Table 1 for list of taxa¹). The fixed plots (50 x 75 cm) are photographed on each visit. In most cases, there are five replicate plots in each zone, initially established over high densities of the target species. Not all core species (zones) are represented at each site.

In 2004, all photos were photographed digitally. Photoplots were photographed with a digital Olympus Camedia Z-5050. The percent cover of core organisms was determined either in the field by laying a grid over the plot or in the office from the digital images. At some sites or at individual plots, field scoring could not be done either because of unfavorable conditions or lack of field time and the plots were then scored in the office by overlaying a grid on the image in Adobe Photoshop, on the computer. In both methods, organisms or bare substrate under each point were counted as one percent cover. Data were recorded onto paper pre-printed data sheets then entered into the database.

Relative abundance and size structure was collected for three species. *Haliotis cracherodii*, black abalone, were counted and measured in fixed irregular plots (5 plots per site) at eleven sites where plots have been established. At each site, a search of a defined area of the reef (or or for a

¹ Taxa are defined as species or groups of similar species that may not be easily separated in the field. Core taxa are those identified by MARINE as species to be searched for and counted by all groups.

period of 30-minutes) was made to obtain a relative abundance of abalone. *Lottia gigantea*, giant owl limpets, were measured within fixed circular plots of one-meter radius (3 to 5 plots per site). *Pisaster ochraceus*, ochre sea stars, were counted in a general search of the reef (for 30-minutes). When possible, 50-100 *P. ochraceus* were measured (radius) for size distribution. At three sites (Johnson's Lee, Fossil Reef, and Landing Cove) where *P. ochraceus* were abundant, fixed transects are done as a rough measure of density within that area.

Motile invertebrates (Table 1) were counted in the photoplots by carefully searching the entire plot. Select species were measured for size frequency distribution. Abundant littorine snails and small limpets were sub-sampled in three small plots (either 20cm x 20cm or 10cm x 10cm, depending on density) within the photoplot area. This sub-sampling is a shift from previous sub-sampling and is now standardized with other MARINE sampling. Motile invertebrate sampling is usually done in the spring, alternating with *Lottia* counts in the fall

Phyllospadix spp., surfgrass, cover was measured on fixed point-intercept transects (10 m long, 100 points) (three transects per site) at four sites (Trailer, Fraser Cove, East Point, Northwest-Talcott). Special circumstances and general conditions that may have affected sampling were described on daily logs, and reported in the trip reports. Surfgrass transect scoring methods follow the MARINE protocol, adding *Phyllospadix* spp. understory for surfgrass covered by algae. Point totals for the cover may now be over 100%; however, the understory category can be ignored to compare with past data where only the top layer was scored.

Shorebird and pinniped observations were made on arrival and throughout the day at each site visit. The numbers reported for each species were the greatest number observed at any one time while working at a site. Visitor numbers were reported by concessioners (Island Packers Company and Truth Aquatics) to the park. No independent counts of visitors were made to verify reported figures.

Field work is conducted during low tides, generally below mean low water (minus tides) known as spring tides, as opposed to neap tides. Spring tides occur twice each month but often occur at night. Sampling dates for the spring and fall seasons were chosen for minus tide series occurring during daylight hours. Sampling was conducted by Dan Richards and Paula Rich with assistance from others, primarily for data recording and seastar counts. Notes about sampling variations, personnel changes, and equipment are documented in trip reports in Appendix C.

Temperature loggers were placed at a number of sites in a cooperative study with PISCO (UCSB). Optic Stowaway temperature loggers from Onset Computer Corporation were placed in PVC (Polyvinyl Chloride) pipe housings strapped to rocks near the mean tide line. Units were downloaded in the field to an Optic Shuttle device and processed on with Onset's Boxcar software.

Taxonomy and nomenclature follow Smith and Carlton (1975), Abbott and Hollenberg (1976), McLean (1978), Morris et al. (1980), and http://ucjeps.berkeley.edu/california_seaweeds.html (accessed 9 June 2010).

Data Analysis

The purpose of this report is to present data collected in 2004. Statistical analysis of the data has not been performed. Any trends presented are simple summary statistics and should be viewed as preliminary. Basic trends of percent cover, averaged by zone, were graphed for key species in photoplots (acorn barnacles, thatched barnacles, mussels, rockweeds (*Silvetia* and *Hesperophycus*), goose barnacles, red algal turf, and tar) using stock charts in Microsoft Excel. These charts provide a quick view of the cover by season compared to the overall range and mean of values through time for each taxa at each site. In order to minimize variability, photoplot target types were not pooled from different zones for analysis. For example, the percent cover of mussels in only mussel zone plots was considered. Descriptive statistics (density, average size, minimum and maximum size), averaged by site, were determined for all circular owl limpet plots and the trend through time was graphed by sampling event. Readers are cautioned that although densities are provided for comparative purposes, plots were chosen within high density areas and should not be considered to be representative of larger areas. Trends of surfgrass were plotted for temporal reference but no analysis was done.

Photoplots, circular plots, and line transects were all “fixed” or measured in the same location every season. The benefit to this sampling design is that it limits some of the natural variability in the system that can obscure important trends in the data, although the tradeoff is that it is not possible to extrapolate trends in the plots to the whole area without using additional information about the area (Murray *et al.* 2006). Therefore, results from photoplots, transects, and circular plots should be interpreted with care.

Table 1. Core species, higher taxa, and substrates scored in photoplots, point intercept transects, circular plots, abalone/seastars, and mobile invertebrate counts at all CINP sites in 2004.

(Target species are shown in bold.)	Photoplots	Surfgrass Transects	Circular Plots	Abalone/ Seastar	Motile Inverts
GREEN ALGAE					
<i>Cladophora columbiana</i>	X				
<i>Ulva/Enteromorpha</i>	X				
Other Green Algae (any greens not listed above)*	X	X			
BROWN ALGAE					
<i>Egregia menziesii</i> (Boa Kelp)	X	X			
<i>Eisenia arborea</i>		X			
<i>Endarachne/Petalonia</i>	X				
<i>Halidrys dioica/Cystoseira</i> spp.		X			
<i>Hesperophycus californicus</i> (= <i>H. harveyanus</i>)	X				
<i>Sargassum muticum</i>		X			
<i>Scytosiphon</i> spp.	X				
<i>Silvetia compressa</i> (= <i>Pelvetia fastigiata</i>)(Rockweed)	X				
Other Brown Algae (any browns not listed above)*	X	X			
Ephemeral browns	X				
RED ALGAE					
<i>Endocladia muricata</i> (Turfweed)	X				
<i>Chondracanthus canaliculatus</i> (= <i>Gigartina canaliculata</i>)	X				
<i>Chondracanthus spinosus</i>	X				
<i>Gelidium coulteri/Pterocladia capillacea</i>	X				
<i>Mastocarpus papillatus</i> (blade)	X				
<i>Mazzaella affinis</i> (= <i>Rhodoglossum affine</i>)	X				
<i>Mazzaella</i> spp. (= <i>Iridaea</i> spp.)	X				
<i>Porphyra</i> spp.	X				
<i>Prionitis</i> spp.	X				
Articulated Corallines (Erect Corallines)	X	X			
Crustose Corallines (Encrusting Corallines)	X	X			
Other Red Algae (any reds not listed above)*	X	X			
ALGAE/PLANTS					
<i>Phyllospadix scouleri/torreyi</i> (Surfgrass)	X	X			
Non-Coralline Crusts (reds and browns)	X	X			
Other Plant/Algae*		X			
ANEMONES					
<i>Anthopleura elegantissima/sola</i> (Green Anemone)	X	X			
POLYCHAETE WORMS					
<i>Phragmatopoma californica</i>	X	X			

Table 1. Core species, higher taxa, and substrates scored in photoplots, point intercept transects, circular plots, abalone/seastars, and mobile invertebrate counts at all CINP sites in 2004 (continued).

(Target species are shown in bold.)	Photoplots	Surfgrass Transects	Circular Plots	Abalone/ Seastar	Motile Inverts
MOLLUSKS					
<i>Acanthina</i> spp.					X
Chitons	X				X
<i>Fissurella volcano</i>					X
<i>Haliotis cracherodii</i> (Black Abalone)				X	
<i>Lepidochitona hartwegii</i>					X
<i>Littorina</i> spp.					X
<i>Lottia gigantea</i> (Owl Limpet)			X		X
<i>Mopalia</i> spp.					X
<i>Mytilus californianus</i> (California Mussel)	X	X			
<i>Nucella emarginata</i>					X
<i>Nuttalina</i> spp.					X
<i>Ocenebra circumtexta</i>					X
<i>Tegula funebris</i>					X
<i>Tegula gallina</i>					X
<i>Tegula</i> spp.	X				
Limpets	X				
Large Limpets > 15mm (excluding <i>L. gigantea</i>)					X
Medium Limpets 5-15mm					X
Small Limpets < 5mm					X
<i>Littorina</i> spp.	X				X
<i>Septifer/Brachydontes</i>	X				
BARNACLES					
<i>Chthamalus dalli/fissus</i> & <i>Balanus glandula</i> (Acorn Barnacle)	X				
<i>Tetraclita rubescens</i> (Thatched Barnacle)	X				
<i>Pollicipes polymerus</i> (Goose Barnacle)	X				
Barnacles*		X			
Other Barnacles (any barnacles not listed above)*	X				
ECHINODERMS					
<i>Pisaster ochraceus</i> (Ochre Star)	X	X		X	X
<i>Pisaster giganteus</i>				X	X
<i>Patiria miniata</i>				X	X
<i>Strongylocentrotus purpuratus</i>					X
CRUSTACEANS					
<i>Pachygrapsus crassipes</i>					X
<i>Pagurus</i> spp.					X
INVERTEBRATES					
Other Invertebrates (Other Animals) (any inverts not listed above)*	X	X			
SUBSTRATES					
Rock (Bare Rock)	X	X			
Sand	X	X			
Tar	X	X			
UNDETERMINED					
Unidentified (cannot tell if plant, invert or substrate)	X	X			
* The specific definitions of these categories are different for photoplots compared to transects.					

Results

2004 Sampling Events

We sampled most sites in both spring and fall in 2004 (Table 2). Exceptions were Santa Barbara Island where we do not conduct the spring sample because of difficulties with accessing the Sea Lion Rookery site due to nesting California brown pelicans, and Cat Rock, Middle Anacapa, and Orizaba Cove because of logistical difficulties as these sites need vessel support for access.

We experienced rain, high wind, and swell during part of the Santa Rosa Island sampling in March. We had some high wind and swell at Santa Cruz in March. At San Miguel in April, we had some light rain one day and large swells. High winds and seas delayed part of our spring Anacapa monitoring in April, but fortunately we were able to make-up the missed days in May during good conditions. In October, we experienced Santa Ana wind at Santa Barbara Island which brought ashes from a mainland fire to the island. High swells were problematic at Santa Barbara Island but we had the advantage being able to spread the sampling over several days. We had generally good conditions in November and December at Santa Rosa and Santa Cruz Islands, though at a few sites, large swells again made difficult conditions for some sampling and prevented seastar and abalone searches. Good conditions prevailed through the January sampling.

Table 2. 2004 Sampling dates for rocky intertidal monitoring sites.

Site	Site Codes	Spring	Fall
Cuyler Harbor, SMI	SMCH	5/7/04	1/24/05
Crook Point, SMI	SMCP	5/9/04	1/23/05
Otter Harbor, SMI	SMOH	5/10/04	1/21/05
Harris Point, SMI	SMHP	5/8/04	1/22/05
Fossil Reef, SRI	SRFR	4/13/04	12/12/04
Johnson's Lee, SRI	SRJL	4/11/04	12/11/04
Ford Point, SRI	SRFP	4/10/04	12/14/04
Northwest-Talcott, SRI	SRNWT	4/12/04	12/13/04
East Point, SRI	SREP	4/9/04	12/9/04
Fraser Cove/Forney Cove, SCI	SCFC	3/31/04	11/12,13/04
Trailer, SCI	SCTR	4/1/04	11/13/04
Willows Anchorage, SCI	SCWA	3/30/04	11/14/04
Scorpion Rock, SCI	SCSR	3/16/04	1/8/05
Prisoner's Harbor, SCI	SCPH	3/29/04	11/11/04
Orizaba Cove, SCI	SCOC	*	*
Cat Rock, ANI	ANCR	*	1/24/05
South Frenchy's Cove, ANI	ANSFC	6/7/04	1/23/05
Middle Anacapa-West	ANMW	*	1/6/05
Middle Anacapa-East	ANME	*	1/6/05
Landing Cove, SBI	SBLC	--	11/10,13/04
Sea Lion Rookery, SBI	SBSLR	--	11/11,12,14/04

--no spring sample because of nesting pelicans

* no sampling due to logistical problems

Photoplots

Photoplot data are summarized in Figures. 3-5 for each target zone and season. Mean percent cover is pooled for all replicate plots per zone by site and season, and is compared to the range and mean cover across all years. Percent cover values of core taxa in each plot are presented in Appendix B. Summary tables (by zone) for each site can be found in the trip reports (Appendix C).

As in most years, there was high variability of species cover (figs. 3-5). *Mytilus californianus* cover was low in most of the plots at Scorpion Rock and at Trailer, due at least in part to predation by *Pisaster ochraceus*. Mussels were only common on the upper reef at Johnson's Lee. Large numbers of *Pisaster ochraceus* ate the mussels on the lower shelf there years ago and continue to keep the numbers low. *Phragmatopoma californica* and *Anthopleura sola* dominate the lower shelf. *Pisaster ochraceus* were also abundant at Ford Point and one mussel plot (532) was recorded as having nearly equal cover of *P. ochraceus* and *M. californianus*. Large *P. ochraceus* were the most likely cause of the low *M. californianus* cover at Scorpion Rock. Orizaba Cove also had low *M. californianus* cover and high number of seastars.

Mytilus californianus recruitment was at high Prisoners Harbor resulting in dense mussel cover in the fall of 2004. Mussels had all been stripped from the reef, possibly by feral pigs the previous winter and *M. californianus* cover was very low in the spring. Mussel recruitment was also noted as high at Willows Anchorage where the beds were thick. Good mussel recruitment was seen at South Frenchy's Cove in the fall. (see trip reports, Appendix. C). New *Pollicipes polymerus* recruits were noted at Fraser Cove.

The mussel beds at Landing Cove were about 10 cm deep and most individual mussels were small (<50 mm) indicating relatively recent settlement. Plot 326 at Landing Cove was bare of mussels and young *Egorgia menziesii* were growing on the exposed rock. Overall mussel cover at Landing Cove was low (figure 3) despite the thick beds because of bare patches that included some plots. *Mytilus californianus* cover was nearly 100% in all mussel zone plots at Sea Lion Rookery.

Mytilus californianus cover at Middle Anacapa and South Frenchy's Cove was well above the long term average, having had good recruitment in recent years. Mussel beds at Middle Anacapa West were noted as being very dense with the majority of mussels attached to each other rather than to the rock, setting up the likelihood of patches being torn out by storm waves.

Hesperophycus californicus cover was below average at all sites except Harris Point. The *Hesperophycus* at Harris Point is very different from the other sites in being both shorter and narrower, resembling *Pelvetiopsis limita* except for the sterile hairs in the conceptacles typical of *Hesperophycus*.

Hesperophycus cover can be volatile, as we saw at East Point where the high cover in spring went to very low levels by the fall sampling (Figure 5). *Hesperophycus* recruitment was seen at Scorpion Rock in the fall, while there seemed to be some loss of plants at Harris Point. *Silvetia compressa* recruitment was seen in the fall sample at Fossil Reef with a mean of 24% *Silvetia* cover there, the highest we've seen in some time, though it was still below the long term average.

Silvetia cover at Landing Cove was very low, following a trend that has been ongoing for a number of years and may be related to the activity of young sea lions that haul out on the rocks there.

At Ford Point, the sandstone reef, where plot 531 was located, broke in spring 2004. In spring 2004, the rock with the plot settled in about the same place but adjacent pieces washed inshore and flipped. The rock with the plot was totally gone by December; however, having moved inshore about 10 m and flipped upside down. The missing rock was estimated to be approximately 12 m². This plot was replaced on nearby mussel reef with similar *Mytilus californianus* cover in May 2005.

Red algal turf, composed of *Gelidium* sp., *Pterocladia* sp. and *Chondracanthus canaliculatus*, is monitored only at Landing Cove. In general the red algae are doing well and densely cover most plots. Surfgrass, *Phyllospadix torreyi*, has grown to dominate two plots in that zone where it has been slowly filling in for several years. *Pollicipes polymerus* zone plots were only established at Fraser Cove where goose barnacle cover has declined slowly over time. There was no change in *P. polymerus* in 2004. *Tetraclita rubescens* are monitored at three sites. One of them, Orizaba Cove was not monitored in 2004. Harris Point and Scorpion Rock showed no change between seasons or from the 2003 levels. Tar is monitored at Fraser Cove where there is extensive cover of tar. This is from natural seeps in the Santa Barbara Channel. There was a slight overall decline in tar cover from 57% in 2003 to about 50% in fall 2004 with most of that going to increased bare rock.

As we have seen in past years, the barnacle and Endocladia zones at Sea Lion Rookery were heavily impacted by the sea lions that lay on the rocks. *Ulva* sp. and some *Chthamalus* and *Tetraclita rubescens* dominate the cover and the few other organisms that persist tend to be in crevices (Figure 2).



Figure 2. High intertidal zone dominated by *Ulva* sp. where sea lions rub over rocks.

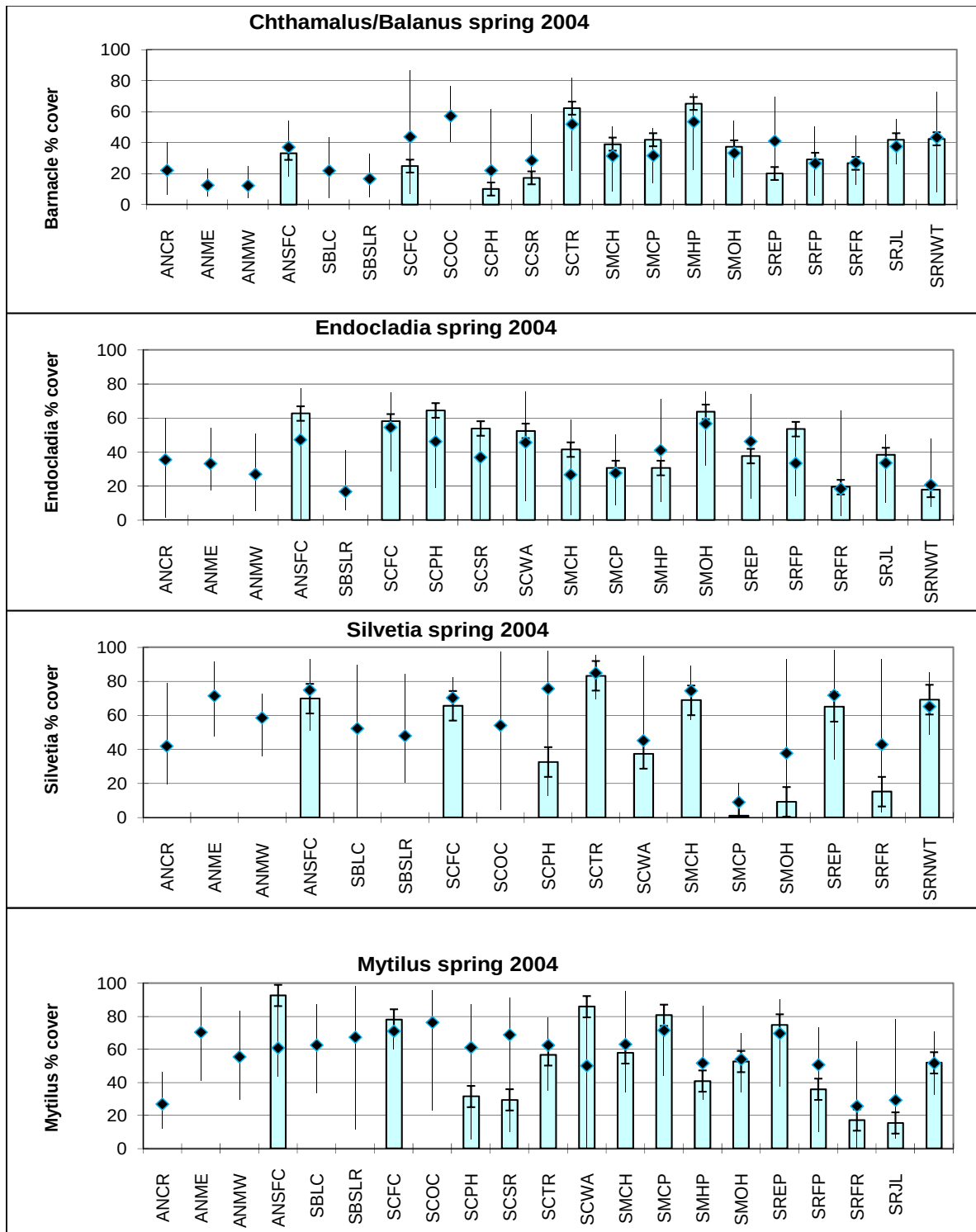


Figure 3. Percent cover of target species (*Chthamalus/Balanus*, *Endocladia muricata*, *Silvetia compressa*, and *Mytilus californianus*) in fixed plots by zone in spring 2004. Bars represent the seasonal mean percent cover from five plots within that zone; error bars represent standard error of the plots at that site. Vertical lines represent the range of means since monitoring began at that site. Diamonds represent the overall mean for all years at that site. See Table 2 for site codes.

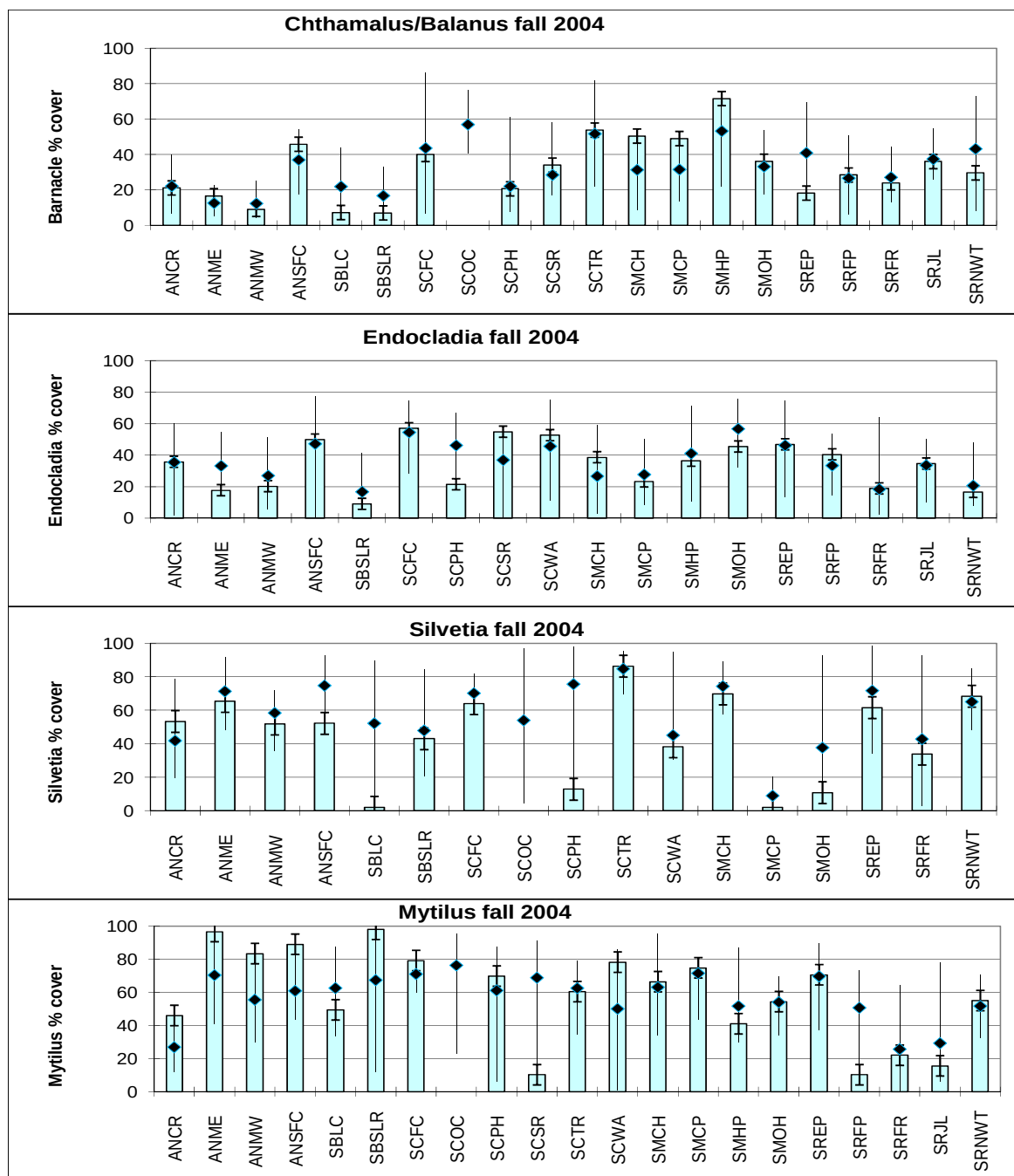


Figure 4. Percent cover of target species (*Chthamalus/Balanus*, *Endocladia muricata*, *Silvetia compressa*, and *Mytilus californianus*) in fixed plots by zone in fall 2004. Bars represent the seasonal mean percent cover from five plots within that zone; error bars represent standard error of the plots at that site. Vertical lines represent the range of means since monitoring began at that site. Diamonds represent the overall mean for all years at that site. See Table 2 for site codes.

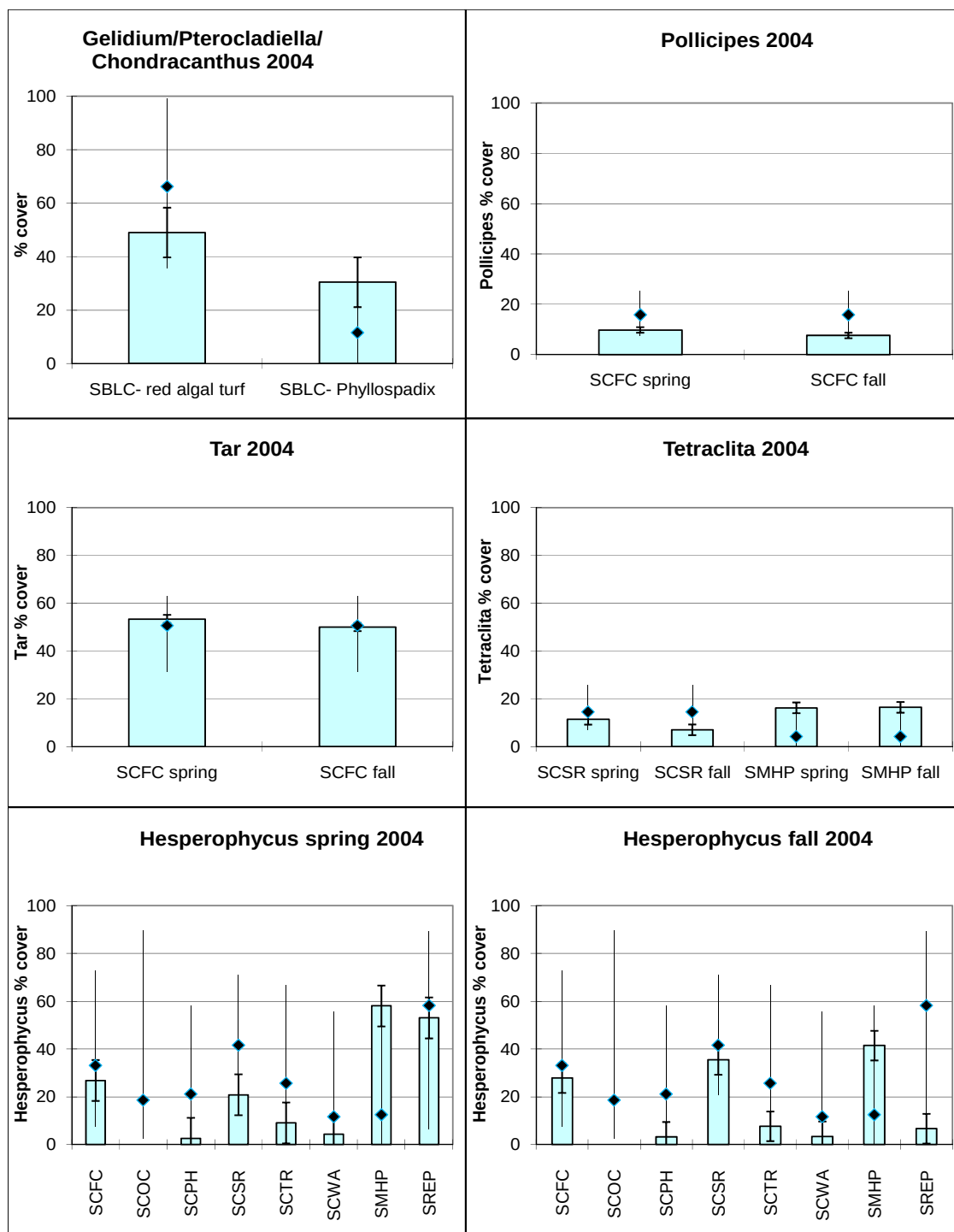


Figure 5. Percent cover of target taxa (Red algal turf, Tar, *Tetracrita rubescens*, *Pollicipes polymerus*, and *Hesperophycus californicus*) in fixed plots by zone in 2004. Bars represent the seasonal mean percent cover from five plots within that zone; error bars represent standard error of the plots at that site. Vertical lines represent the range of means since monitoring began at that site. Diamonds represent the overall mean for all years at that site. See Table 2 for site codes.

Motile Invertebrates

Tegula funebris was common in the *Silvetia* zone plots at many sites. *Tegula gallina* were found at Prisoner's Harbor, Fraser Cove, Trailer, East Point, Ford Point, Johnson's Lee, Northwest-Talcott, Fossil Reef, and Cat Rock. Often only one *T. gallina* was found at a site, though others undoubtedly existed. *Tegula gallina* is considered a warmer water species and though not uncommon, it is typically only found in low numbers at the northern islands.

Nucella emarginata were largest in size at the western sites (Santa Rosa and San Miguel islands). *Nucella* were especially abundant at Cuyler Harbor, but were also abundant at Fraser Cove and East Point. Willows Anchorage had fairly low numbers of *N. emarginata* but that may be due to the dense mussels in plots making it hard to find the snails. Alternatively the snails may not have been able to live among the tightly packed mussels.

Pachygrapsus crassipes were noted as common to abundant at most sites, but were especially abundant at Sea Lion Rookery. Sea Lion Rookery had very low numbers of snails and chitons within the plots.

Littorina spp. can be very abundant at some sites and we sub-sampled to count them. The extrapolated averages varied greatly from a low of only 1.1 per plot at Landing Cove to over 867 per plot at East Point. *Littorina* spp. are usually most abundant within the barnacle plots and densities in those plots can be in the thousands per plot.

Nemerteans, not counted in the motile invertebrate counts, were noted as common at Scorpion Rock in the field log. Results tables of counts and sizes for motile invertebrates are included in the trip reports (Appendix. C).

Halotis cracherodii

Only two black abalone were found inside fixed abalone monitoring plots in 2004, both at Otter Harbor (Table 3). Timed searches were low partly because of poor conditions in the spring. The shortage of experienced personnel during fall sampling at San Miguel resulted in inadequate searches. No recent recruitment was seen and the smallest abalone found there was 50mm.

Figure 7 shows the size distribution of all the abalone found at all sites in spring 2004. No young recruits were found. The smallest abalone found were 50 mm, which size is typically thought to be about four to five years old (Haaker et al. 1995).

The number of black abalone found in 30-minute searches at each site is presented in Tables 4 and 5. Otter Harbor had the highest counts, almost triple the next highest count at Harris Point. Three *Halotis cracherodii* were found at the main Anacapa Middle West site (Figure 6). We were unable to survey the abalone plots at Harbor Seal Arch (part of Middle West) but we have not seen abalone there for some time. No abalone were found at Cuyler Harbor, Fraser Cove, South Frenchy's Cove, or Landing Cove. No symptoms of Withering Syndrome were observed.



Figure 6. *Haliotis cracherodii* at Middle Anacapa Island.

Table 3. *Haliotis cracherodii*, black abalone, counts from 2004 sampling. Data from sites are combined by island. CountRandom is the number of abalone from 30-minute search, CountInPlot is the number of abalone found in fixed plots (not all sites were monitored each season, thus area size is different).

Island Code	Year	Season	Count Random	Count InPlots	Area (m ²)	Density (m ²)	Count Sized	Mean Size	StDev	Min Size	Max Size
AN	2004	fall	2	0		0.0	5	99.00	22.66	64	125
SB	2004	fall	1	0		0.0	1	66.00		66	66
SC	2004	spring	11	0		0.0	11	93.36	27.43	50	130
SM	2004	spring	72	2	2.5	0.8	74	103.16	19.71	50	145
SM	2004	fall	14	0		0.0	14	110.14	14.69	80	145
SR	2004	spring	16	0		0.0	16	124.13	27.88	75	173
SR	2004	fall	20	0		0.0	20	129.90	28.05	91	177

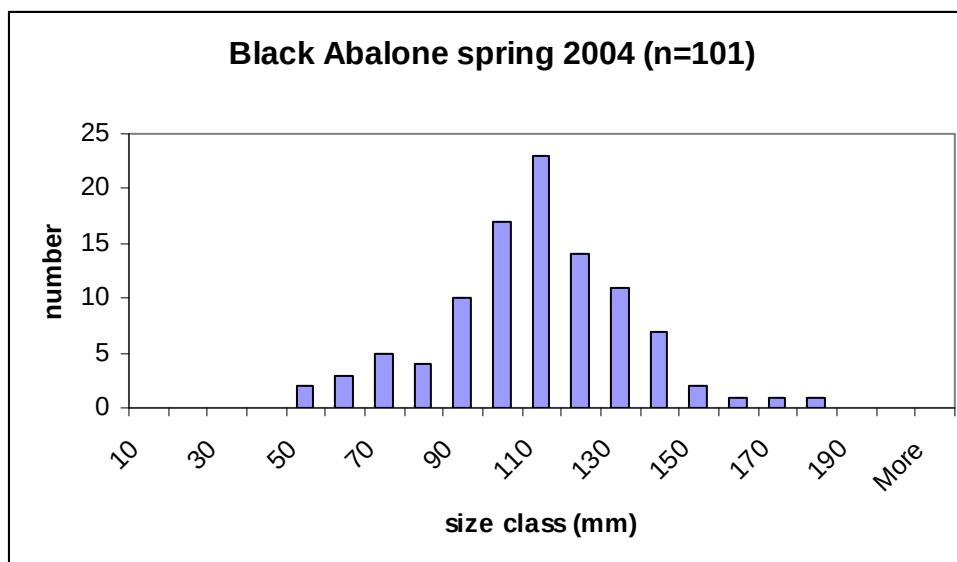


Figure 7. *Haliotis cracherodii* size distribution in spring 2004, all sites combined (n=101).

Table 4. Sea star and black abalone searches in spring 2004. (x indicates no plot or transect, nc indicates no count performed, P.o.= *Pisaster ochraceus*, P.g.=*P. giganteus*, P.b.= *Pisaster brevispinus*, P.h.=*Pycnopodia helianthoides*, P.m.= *Patiria miniata*).

Site	Sampling Date	Seastars in 30 min			Seastars in transects	Abalone in plots	Abalone search
		P.o.	P.g.	P.m.			
Cuyler Harbor, SMI	5/7/04	95	2	0	x	x	0
Crook Point, SMI	5/9/04	57	0	0	x	0	7
Otter Harbor, SMI	5/10/04	13	1	1.	x	0	48
Harris Point, SMI	5/8/04	8	1	3		2	17
Fossil Reef, SRI	4/13/04	133	1	0	x	0	9
Johnson's Lee, SRI	4/11/04	391	2	0	64 (10x2)	0	2
Ford Point, SRI	4/10/04	514	3	0	x	0	3
Northwest-Talcott, SRI	4/12/04	3	1	0	x	0	1
East Point, SRI	4/9/04	126	2	2	x	0	1
Fraser Cove, SCI	3/31/04	81	0	0	x	x	0
Trailer, SCI	4/1/04	150	0	0	x	x	6
Willows Anchorage, SCI	3/30/04	671	0	0	x	x	5
Scorpion Rock, SCI	3/16/04		Nc		x	x	Nc
Prisoner's Harbor, SCI	3/29/04	83	0	0	x	x	nc
Orizaba Cove, SCI	Ns						
Cat Rock, ANI	Ns						
South Frenchy's Cove, ANI	6/7/04		nc.		x	x	nc
Middle Anacapa-West	Ns						

Table 5. Sea star and black abalone searches in fall 2004. (x indicates no plot or transect, nc indicates no count performed, P.o.= *Pisaster ochraceus*, P.g.=*P. giganteus*, P.b.= *Pisaster brevispinus*, P.h.=*Pycnopodia helianthoides*, P.m.= *Patiria miniata*).

Site	Sampling Date	Seastars in 30 min			Seastars in transects	Abalone in plots	Abalone search
		P.o.	P.g.	P.m.			
Cuyler Harbor, SMI	1/24/05	141	1	0	x	x	0
Crook Point, SMI	1/23/05	68	0	0	x	0	3
Otter Harbor, SMI	1/21/05	28	0	0	x	nc	nc
Harris Point, SMI	1/22/05	6	0	10	x	nc	11
Fossil Reef, SRI	12/12/04	141	0	0	95 (30x6)	0	2
Johnson's Lee, SRI	12/11/04	413	1	0	59 (10x2)	0	3
Ford Point, SRI	12/14/04	345	1	0	x	0	11
Northwest-Talcott, SRI	12/13/04	0	2	2	x	0	2
East Point, SRI	12/9/04	55	1	0	x	x	2
Fraser Cove, SCI	11/12/04	51	0	1	x	x	nc
Trailer, SCI	11/13/04	77	0	0	x	x	nc
Willows Anchorage, SCI	11/14/04	379	0	0	x	x	nc
Scorpion Rock, SCI	1/8/05	104	0	0	x	x	0
Prisoner's Harbor, SCI	11/11/04	54	0	0	x	x	nc
Orizaba Cove, SCI	Ns						
Cat Rock, ANI	1/24/05	3	0	0	x	0	2
South Frenchy's Cove, ANI	1/23/05	0	0	0	x	x	0
Middle Anacapa-West	1/6/05	86	0	0	x	nc	3
Sea Lion Rookery, SBI	11/12/04	109	0	0	x	x	1
Landing Cove, SBI	11/11/04	130	0	0	14 (18x2)	0	0

Lottia gigantea

Lottia gigantea are usually only sampled in the fall samples, alternating with motile invertebrate counts. We did sample two sites on Santa Rosa Island in the spring also. *Lottia gigantea* counts were down at nearly all sites (figs. 8-11). Several sites were at the lowest densities since monitoring began. There haven't been any sharp drops in their numbers, just a slow decline in the density at most sites. Some of the Santa Rosa sites had densities that were only about 20% of their highest densities.

San Miguel Island had the highest density of *L. gigantea* in 2004 with a mean of 10.2 m^{-2} . Santa Cruz Island had the lowest density of only 3.4 m^{-2} island-wide. Note that there is high variability between sites on an island and even between plots within a site. For example at Fossil Reef, two of the plots have declined considerably, however the other three maintained high densities and the overall trend for the site is stable with only a slight decline.

Anacapa Island had the smallest mean size, though only slightly smaller than at San Miguel (32.8 mm vs. 35.5 mm) (Table 6). Santa Cruz and Santa Rosa both had mean sizes of over 50 mm. The size distributions vary greatly between sites also. Willows Anchorage *L. gigantea* are skewed towards the smaller sizes and have a mean size of 38 mm while Fraser Cove is skewed towards larger sizes and a mean of 49 mm. (fall trip report – Appendix C).

We have no fixed plots for owl limpets at Sea Lion Rookery; however, we did do a random search for size frequency measurements and those data are included in Tables 6 and 7. Anacapa Island had the highest percentage of young animals with over 40% under 30 mm (Table 7). Data for individual sites can be found in the field logs in Appendix C.

The number of owl limpets at Johnson's Lee was low in three of the five plots. Sizes there ranged from 11-93 mm and over 40% of them were less than 30 mm (Appendix. C). Owl limpet recruitment also seemed to be high at Ford Point where nearly 50% of the *L. gigantea* in plots were under 30 mm. Owl limpet densities at both Johnson's Lee and Ford Point appear to have declined overtime for unknown reasons (Figure 10). The largest individuals were found at Northwest-Talcott with one limpet at 108 mm (Table 6). There was a high degree of variability among plots at individual sites.

Table 6. *Lottia gigantea* plot count and size information. All sites poled by island. (Santa Rosa spring sample was only two sites.)

IslandCode	Year	Season	Count	Area	Density	MeanSize	StDev	MinSize	MaxSize
AN	2004	fall	116	18.85	6.155	32.78	12.43	14	64
SB	2004	fall	118	0	-----	41.04	12.09	17	74
SC	2004	fall	150	43.97	3.411	52.49	18.22	16	96
SM	2004	fall	321	31.41	10.220	35.48	12.58	15	77
SR	2004	spring	221	31.41	7.036	53.76	23.22	10	103
SR	2004	fall	503	62.82	8.007	51.19	21.87	11	108

Table 7. Size distribution of *Lottia gigantea*. All sites pooled by island. (Santa Rosa spring sample was only two sites.)

Island Code	Season	%<20mm	%20- 29mm	%30- 39mm	%40- 49mm	%50-5 9mm	%60- 69mm	%70- 79mm	%80- 89mm	%90- 99mm	%>= 100mm
AN	fall	16.38%	25.86%	28.45%	18.10%	9.48%	1.72%	0.00%	0.00%	0.00%	0.00%
SB	fall	3.39%	12.71%	27.97%	33.05%	16.10%	5.08%	1.69%	0.00%	0.00%	0.00%
SC	fall	2.00%	8.00%	16.67%	22.00%	18.00%	15.33%	7.33%	8.00%	2.67%	0.00%
SM	fall	8.41%	27.10%	33.02%	17.76%	8.10%	4.67%	0.93%	0.00%	0.00%	0.00%
SR	spring	6.79%	11.76%	14.48%	9.05%	14.48%	15.38%	13.57%	8.14%	5.43%	0.90%
SR	fall	10.93%	11.73%	7.36%	11.13%	22.07%	14.71%	13.12%	5.57%	2.39%	0.99%

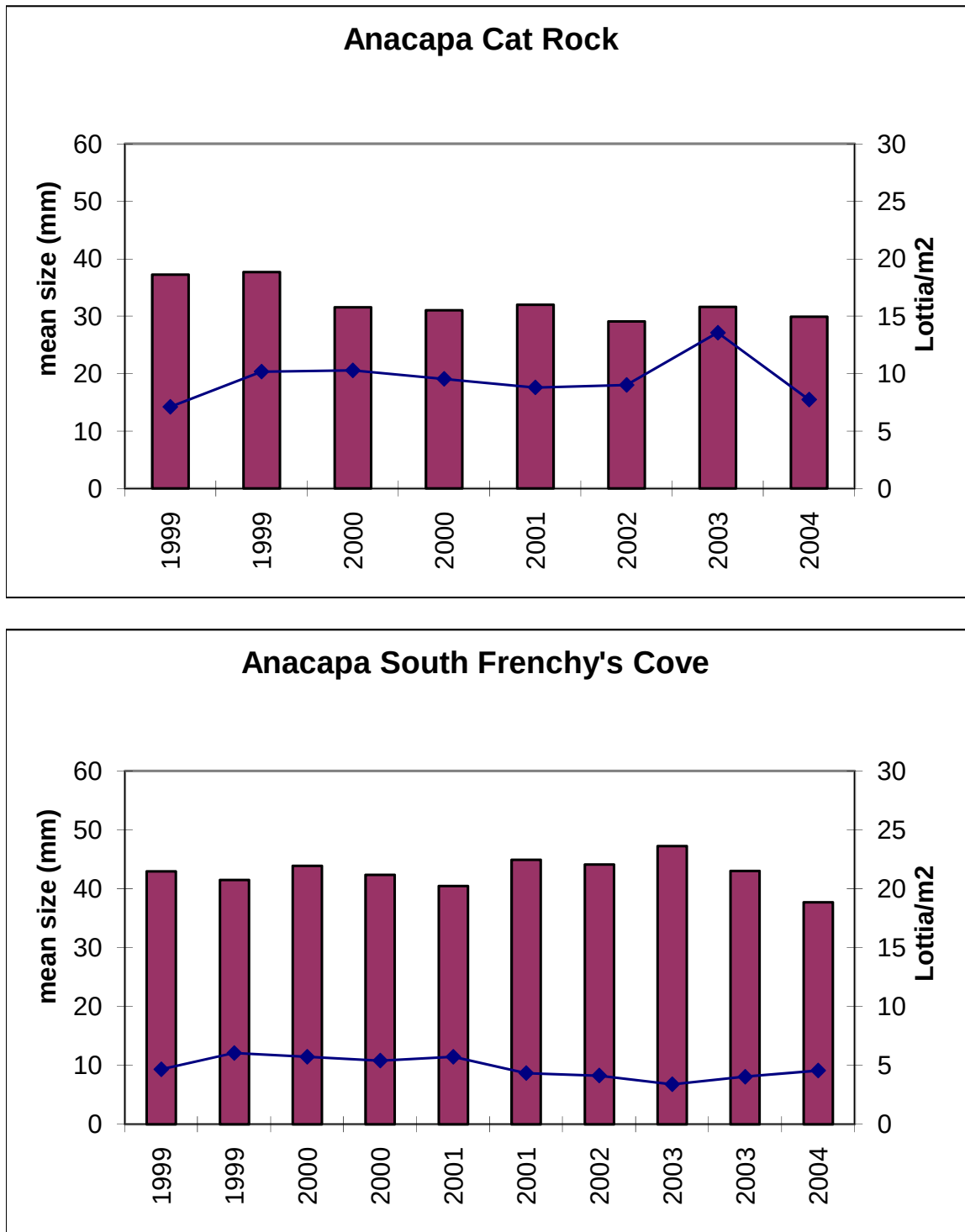


Figure 8. *Lottia gigantea* at Anacapa Island 1999-2004. Bars represent mean size (mm) and lines represent mean density from three fixed plots.

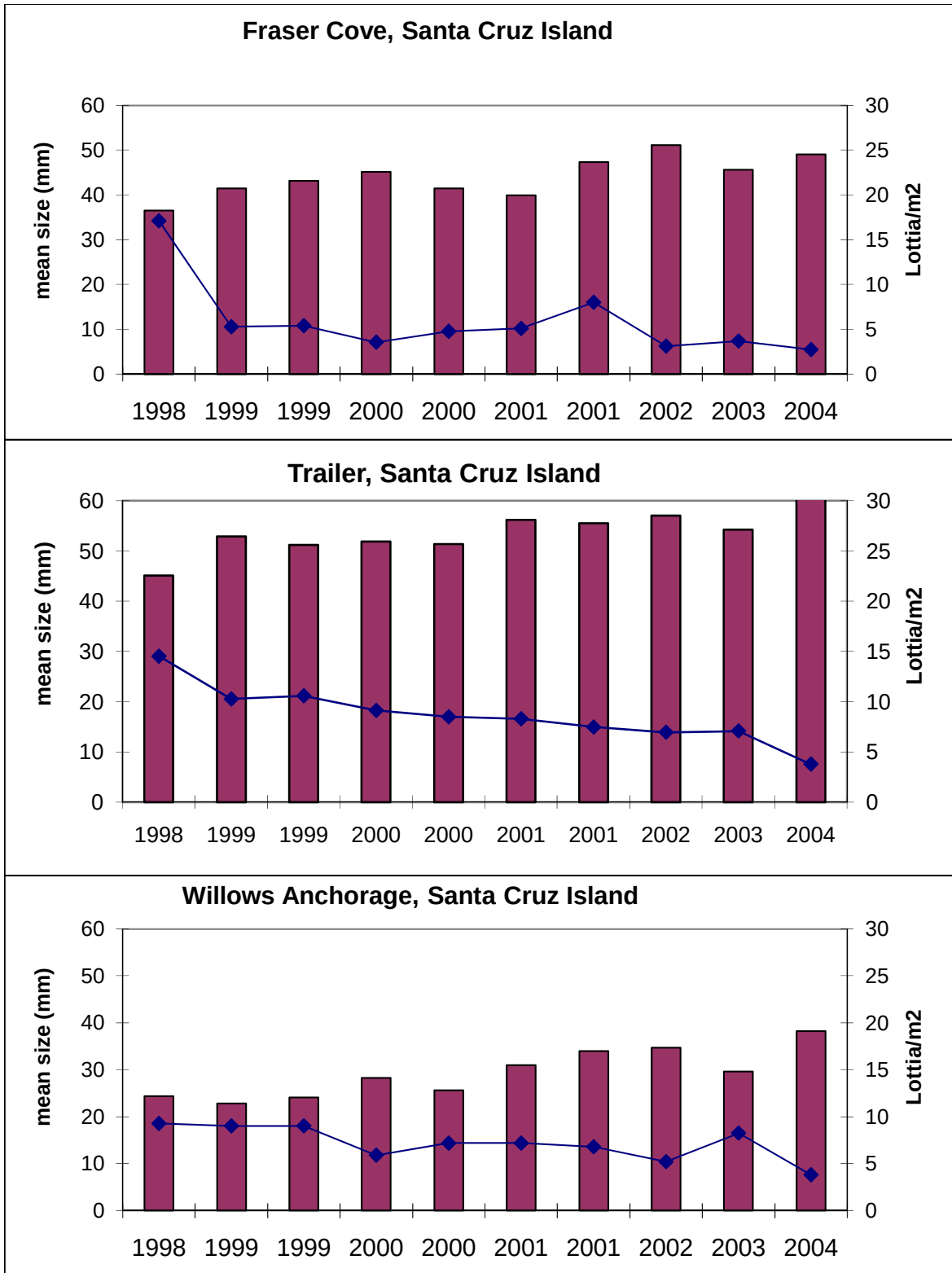


Figure 9. *Lottia gigantea* at Santa Cruz Island 1998-2004. Bars represent mean size (mm) and lines represent mean density from five fixed plots.



Figure 10. *Lottia gigantea* at Santa Rosa Island 1998-2004. Bars represent mean size (mm) and lines represent mean density from five fixed plots.

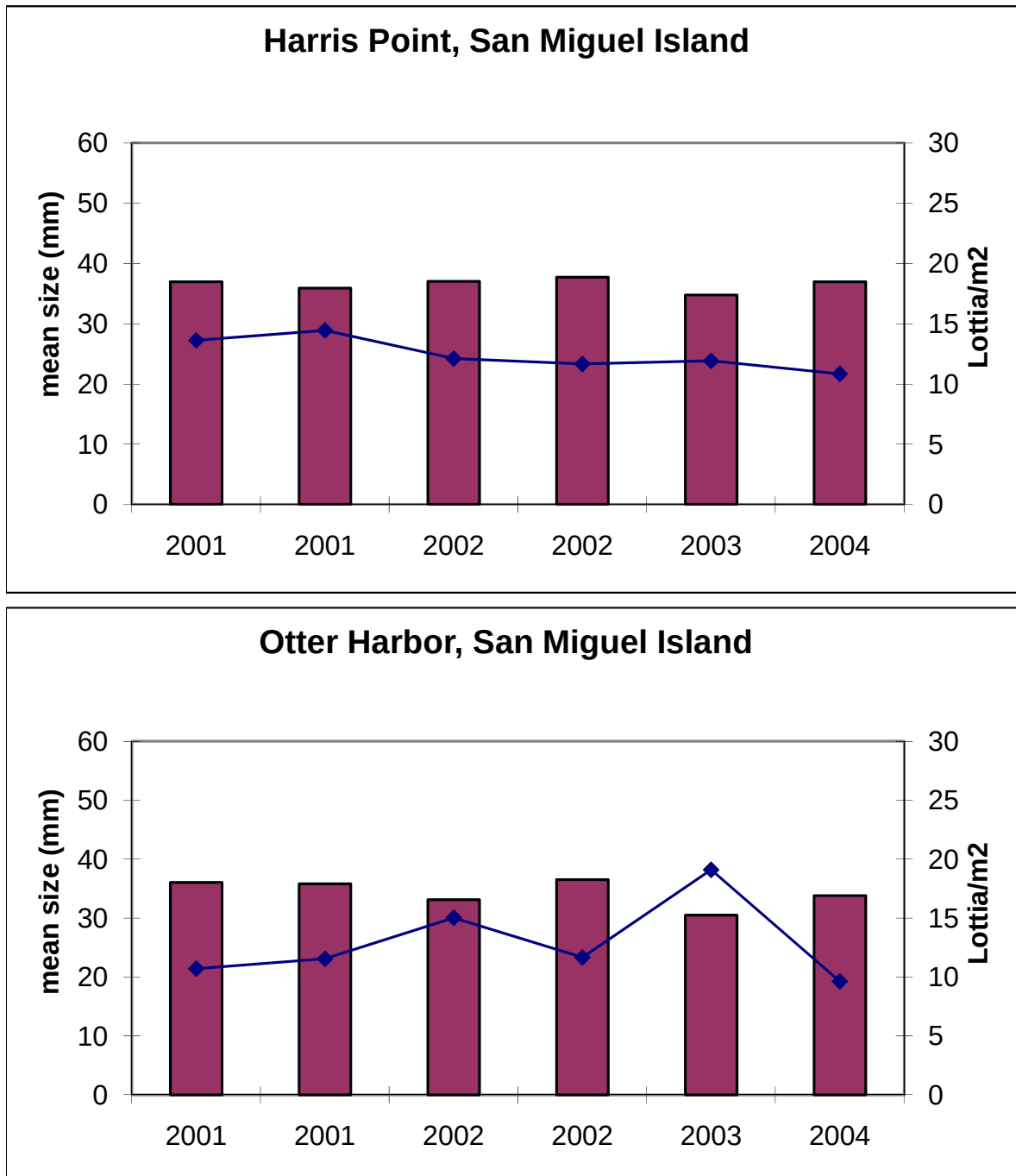


Figure 11. *Lottia gigantea* at San Miguel Island 2001-2004. Bars represent mean size (mm) and lines represent mean density from five fixed plots.

Pisaster ochraceus

Pisaster ochraceus are the most common sea star in the rocky intertidal zone. Because they can be highly mobile, we generally monitor them in timed counts rather than fixed plots. There are a few areas where we consistently find aggregations of *P. ochraceus* and we follow changes within those areas using transects to gather some density information. Information on timed searches and transects is shown in Tables 4 and 5. The highest counts were at Willows Anchorage (with 671 found in a 30-minute search) but high numbers were also seen at Ford Point and Johnson's Lee (Figure 12). Northwest-Talcott and South Frenchy's Cove typically have the lowest counts. Only two *p. ochraceus* were found at Northwest-Talcott in the spring and none were found in the fall. *Pisaster giganteus* tend to be more common at Northwest-Talcott, but were still rare. Only eight *P. ochraceus* were found at Harris Point and 13 at Otter Harbor. South Frenchy's Cove had no seastars. *Pisaster* occur in the lowest intertidal zones and because of poor conditions, surveys could not be done at all sites in all seasons.

Distribution within size categories were collected whenever possible and those data can be found in the trip reports (Appendix C). We began taking regular size frequency measurement of *P. ochraceus* in the fall and the histograms are shown in the trip reports. Color (orange or purple) was tracked at most sites. Researchers from PISCO were interested in the color frequency. Many small *Pisaster ochraceus* (<50mm) were seen at Johnson's Lee and no large *Pisaster* were found there. A broad range of sizes was found at Willows Anchorage, but spikes in the size frequencies were below 100 mm, indicating a young population. In contrast most of the stars found at Fossil Reef were over 100 mm indicating older seastars and low recruitment. Only 60 *P. ochraceus* were found at Sea Lion Rookery but the majority of them were under 50 mm radius. The *P. ochraceus* at Prisoner's Harbor and at Fraser Cove were all over 120 mm.



Figure 12. *Pisaster ochraceus* in mussel bed at Willows Anchorage.

Phyllospadix

Phyllospadix spp., surfgrass, cover was monitored at two sites each on Santa Cruz Island and Santa Rosa Island. Transects have not been established at other sites because of general lack of high density surfgrass habitat. *Phyllospadix torreyi* was the dominant species present in most transects but some *P. scouleri* may have been present. Figures 14 and 15 show the trends for each of the three transects at the four sites. Tables with complete results from 2004 are in the trip reports (Appendix C).

Surfgrass overstory cover remained relatively high in all transects (figs. 14-15) with *Phyllospadix* cover only dropping below 50% in Transect 1 at Fraser Cove. Transect 3 at Northwest-Talcott continued to recover from the disturbance caused by an overturned boulder in spring 2003 (Figure 15). There was heavy epiphytic growth of *Enteromorpha* sp. on shallow reefs and *Smithora naiadum* or *Punctaria* sp. in deeper pools. About 60% of the *Phyllospadix* sp. on the transects at Northwest-Talcott was bleached (Figure 13). Bleaching and epiphytic growth at East Point was light.

We were unable to find any of the marker bolts for Transect 1 at Fraser Cove and thus did not read the cover in fall (fig 14). In the spring, all sites reported moderate to high bleaching, but bleached blades were rare in the fall. We estimated nearly 30% of the surfgrass at Fraser was bleached and abraded in the spring. This is usually the result of low daytime tides and too much exposure. At Trailer, other red algae, often *Chondracanthus canaliculatus* or *Prionitis lanceolata*, was the next most abundant category. *Phyllospadix* spp. at Trailer had fairly high bleaching in spring and abundant *Smithora naiadum*, a common epiphyte.



Figure 13. *Phyllospadix* Transect 2 at Northwest-Talcott with high percentage of bleached surfgrass.

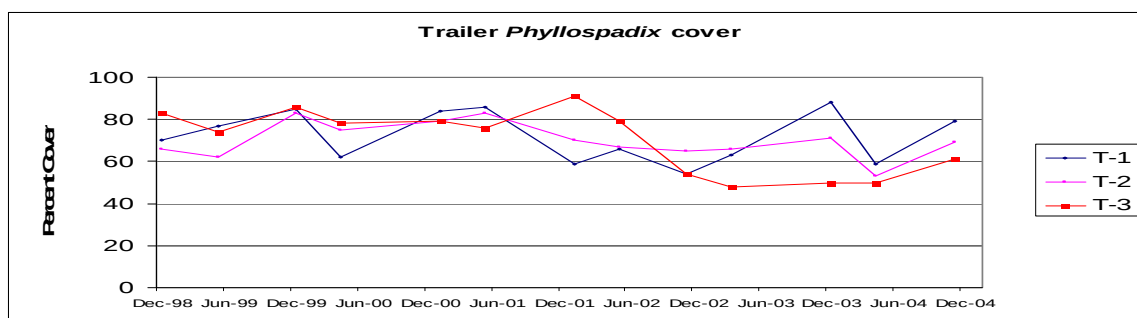
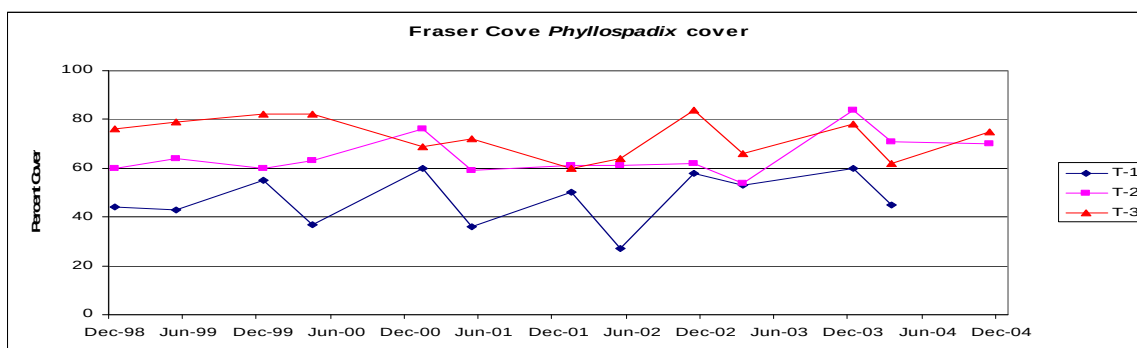


Figure 14. *Phyllospadix* spp. cover trends on 10m point-intercept transects at Trailer and Fraser Cove, Santa Cruz Island.

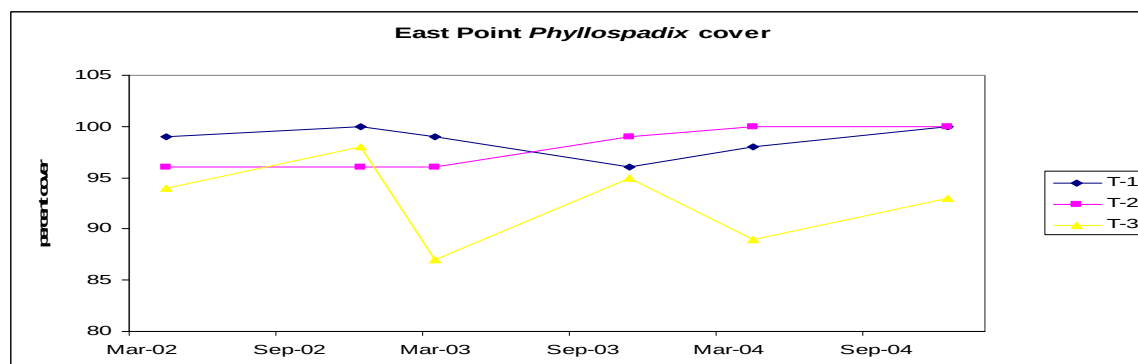
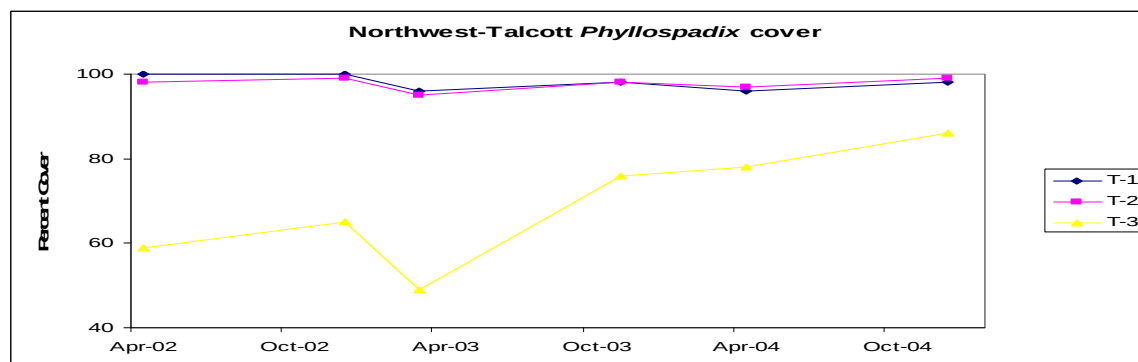


Figure 15. Surfgrass, *Phyllospadix* spp., cover trends on 10m point-intercept transects at Northwest-Talcott and East Point Santa Rosa Island.

Shorebirds and Pinnipeds

Tables 8 and 9 show summaries of the shorebird and pinnipeds observed at the sites in 2004. In 2004, we had three sightings of American Oystercatchers, *Haematopus palliatus*, from three different sites on two islands. Black Oystercatchers, *H. bachmani*, were again the most ubiquitous shorebird, though the sightings were down from 2003. Large numbers were seen near Fossil Reef where we recorded 37 at one time in the fall sample. Other shorebirds seen were whimbrel, wandering tattler, black turnstones, and black bellied plover. Seabirds such as pelicans and cormorants frequently use rocky points (e.g. East Point and Fossil Reef) and islets (e.g. Scorpion Rock and Orizaba Cove) as roosting areas. Western gulls, *Larus occidentalis*, are often seen foraging among the mussel beds and adjacent beaches.

Harbor seals, *Phoca vitulina*, were observed within the immediate vicinity of eight of the sites. They were most numerous at Otter Harbor where they haul out on the protected flat rocky bench to rest at low tide. Northern elephant seals, *Mirounga angustirostris*, usually prefer sandy beaches over rocky shelves to haul out. They are a common sight near Cuyler Harbor, Crook Point, and Fossil Reef in the spring when we find weaned pups that haven't gone to sea yet or adults coming ashore to molt. It was unusual to see immature elephant seals at Harris Point as we did in 2004. California sea lions, *Zalophus californianus*, were common at both Santa Barbara Island sites where they can be very numerous. Especially at Sea Lion Rookery, sea lions were responsible for trampling the upper reef, contributing much nitrogen to the system, and no doubt, contributing to blooms of *Ulva* sp. There was a dead elephant seal on the reef at Otter Harbor. A dead harbor seal pup was found at Otter Harbor in the fall. Western gulls had nests with three eggs each when we were there in May.

Table 8. Shorebirds and pinnipeds at monitoring sites in spring 2004 (maximum seen at any onetime).
 (*= nearby but not on monitoring reef). Refer to Table 2 for site codes.

Site	Black Oystercatcher/ (American)	Black Turnstone	Other birds	<i>Phoca vitulina</i>	<i>Mirounga angustirostris</i>	<i>Zalophus californianus</i>
ANSFC	3					
SCFC (Forneys)	6	1	1 Whimbrel, 1 Bonaparte's gull			
SCFC (Fraser)	10/(1)	6	1 black-bellied plover, 1 Bonaparte's gull			
SCPH						
SCSR	3/(1)		2 western gull			
SCTR	3	6		2		
SCWA	5*		1 western gull			
SREP	4					
SRFP	2	2				
SRFR	7			6		3
SRJL	2	11	1 surfbird			
SRNWT	2	10		8		
SMCH	5				*13	
SMCP	4/(1)	1			5	
SMHP	3			1	*1	1
SMOH	6	1	6 double-crested cormorant, 20 western gull	14	2	

Table 9. Shorebirds and pinnipeds at monitoring sites in fall 2004 (maximum seen at any onetime).
(*= nearby but not on monitoring reef). Refer to Table 2 for site codes.

Site	Black Oystercatcher/ (American)	Black Turnstone	Other birds	<i>Phoca vitulina</i>	<i>Mirounga angustirostris</i>	<i>Zalophus californianus</i>
SBLC	2	2	1 wandering tattler, 6 western gull			68
SBSLR	3	8	100 western gull			210
ANCR	4		2 western gull	*		
ANMW/ANME	7	3	1 wandering tattler	1		
ANSFC	*4			*1		
SCFC (Forneys)			2 western gull			
SCFC (Fraser)	5		1 willet			
SCPH						
SCSR	2/(1)		2 western gull			
SCTR	2					3
SCWA			2 western gull			
SCSR						
SREP	4	15	3 brown pelican, 5 cormorant	2		
SRFP	6					
SRFR	37	1	50 Brandt's cormorant, 3 pelagic cormorant, 5 western gull	*15	*100	
SRJL	2	2			1	
SRNWT	3				*1	
SMCH	1				*2	
SMCP	1		1 western gull		*	
SMHP			2 brown pelican, 6 western gull	8	*1	
SMOH	5		1 pelagic cormorant, 20 western gull	25	1	

Visitation

Visitation to Frenchy's Cove on Anacapa Island is reported here since trips to Frenchy's are usually specifically to visit tidepools. Most visitor experiences with the rocky intertidal occur at Frenchy's Cove, though some Santa Rosa Island visitors see East Point tidepools with a park naturalist or on their own, and visitors to Prisoner's Harbor at Santa Cruz Island sometimes climb up onto the reef there where monitoring plots are located. Island Packers Company generally conducts classroom programs, combining oceanography with the tidepool experience for area school groups in the winter and spring months.

Visitation numbers for Frenchy's Cove are available from monthly reports based on concessionaire reporting from Island Packers Company and Truth Aquatics (Table 10, Figure 16). No records are available for the number of private boaters going ashore there. Visitation figures for East Point, Santa Rosa Island are not available.

The total visitation from concession boats in 2004 was 2275 passengers in 30 trips (Table 10) which was less than the 2733 passengers in 2002, but slightly more than in 2003. March was once again the top month for visitation with 847 passengers on 11 trips, the only month that exceeded the recommended 500 visitors per month. Sixty-seven percent of the visitation occurred in the spring (February-May). Visitation by the concession boats was spread throughout the year with no visitation in June, September, or December. No data were available for October. The lack of data in October may account for some of the lower visitation for the year though October isn't traditionally a high visitation month. The yearly trends for visitation to Frenchy's Cove are shown in Figure 17.

Table 10. Visitors to South Frenchy's Cove, Anacapa Island in 2004 (visitation with Island Packers).

Year	Month	#Passengers	#Trips	Average No Passengers/trip
2004	January	45	1	45
2004	February	184	3	61
2004	March	847	11	77
2004	April	400	6	67
2004	May	94	2	47
2004	June	0	0	0
2004	July	264	3	88
2004	August	254	2	127
2004	September	0	0	0
2004	October	nd	nd	nd
2004	November	187	2	94
2004	December	0	0	0
2004	total	2275	30	76

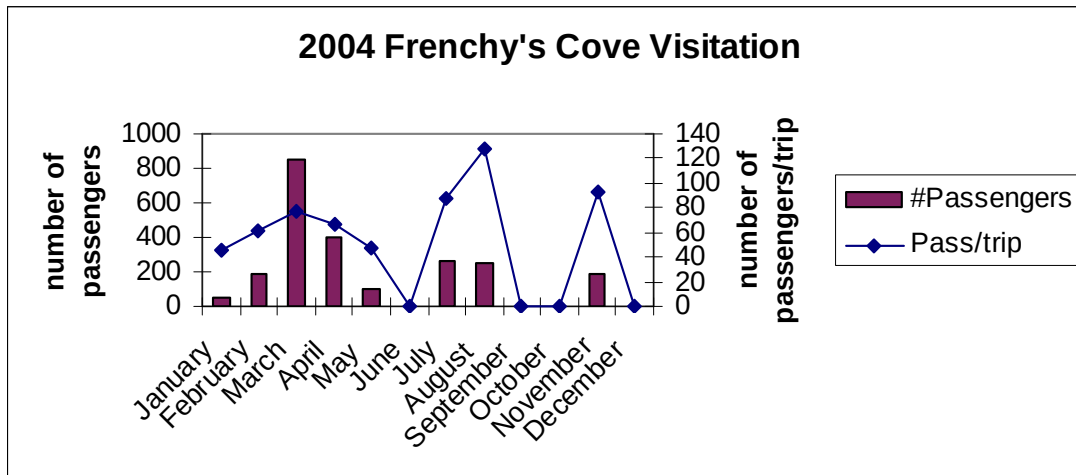


Figure 16. Visitation at Frenchy's Cove, Anacapa (Island Packers visitors).

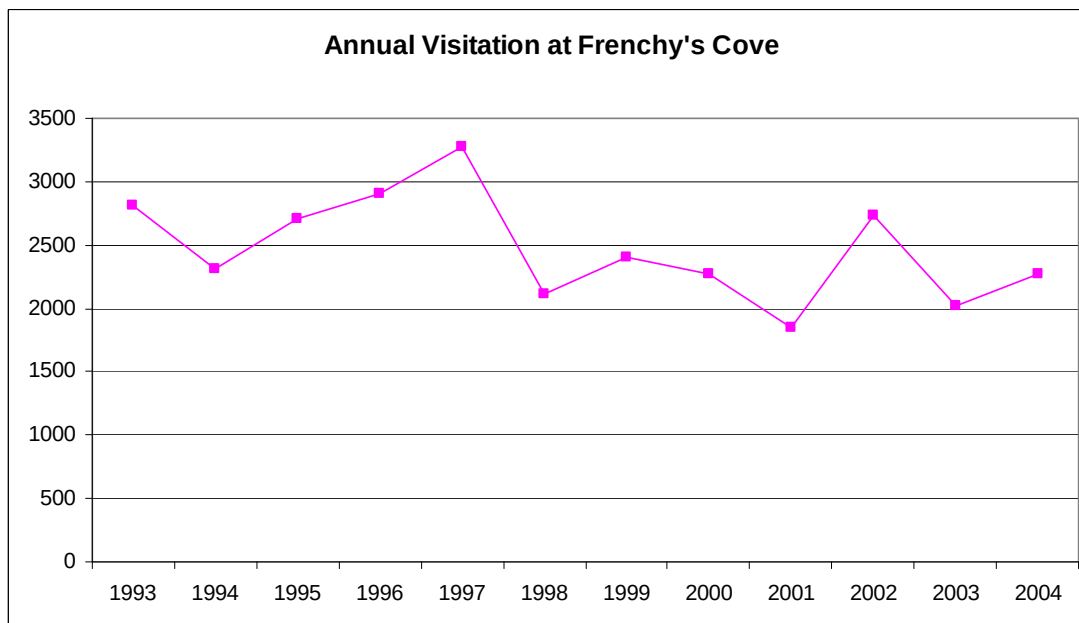


Figure 17. Annual commercial visitation at Frenchy's Cove, Anacapa (Island Packers visitors) 1993-2004.

Trip Reports

Trip reports were written by Dan Richards and Paula Rich. Summaries of work performed, data collected, weather conditions, and natural history observations for each sampling event are presented in the individual trip reports in Appendix C. Explanations for missing or incomplete data are usually found there. Summary tables and figures in the trip reports present additional information on species monitored. For simplicity, photoplot data tables use the combinations of species in lumped categories used in previous reporting (non-core species are combined in Misc. plants or animals). More detailed results of seastar, surfgrass, and motile invertebrate sampling are presented in the daily trip reports.

Trip reports contain information on beach surveys or other work done. Beachwalk surveys were conducted on the same trips as the rocky intertidal monitoring at Santa Cruz and Santa Rosa Islands in the spring. Those surveys collected information primarily on live and dead seabird and marine mammals on the beaches. Those data are reported in Rich and Richards 2005.

Discussion

From our observations, *Pisaster ochraceus* are the most important predator on *Mytilus californianus* at the northern islands. Other seastars (*P. giganteus*, *Leptasterias hexactis*) may prey on mussels, but their numbers are probably too low to be of consequence. *Leptasterias* is generally small (under 70 mm radius), limiting its impact to small animals only. Snails, primarily *Nucella emarginata* and *Ceratostoma nuttallii* can be numerous, and they may be important in regulating mussel recruitment at some sites. Lobsters (*Panulirus interruptus*) sea otters (*Enhydra lutris*) and humans can all have significant impacts on mussels; however, fishing and other exploitive activities are limited in the intertidal zone in the park and sea otters are currently rare and probably focused on other, easier to access prey. Lobsters may be important mussel predators at Santa Barbara, Anacapa, and Santa Cruz where they can be numerous, as Robles et al. (1990) showed at Catalina Island; however, we have no direct evidence from our monitoring.

Mussel beds can be susceptible to storms and large swells. Especially when mussel beds are very dense, the individuals may be anchoring themselves to other mussel shells rather than rock (Figure 18). As the beds become several mussels deep, the overall mass of a portion of bed may not have many secure points to the rock and the whole mass may be torn out by high waves. We observed such dense beds at Landing Cove and Middle Anacapa West in 2004.



Figure 18. Young recruits of *Mytilus californianus* settling into established bed at Otter Harbor.

Pisaster ochraceus can occur in such high densities that they can affect entire reef communities. At Johnsons Lee, the former mussel bed on the lower shelf there was transformed to a mix of *Phragmatopoma californica* and *Anthopleura sola* in the early 1990s, and that mix has remained stable since. We have observed high densities of *P. ochraceus* associated with declines in mussel plots at Ford Point, Willows Anchorage, Scorpion Rock, and Orizaba Cove. High recruitment of mussels may temper severity and duration of the impacts from marauding seastars. We have

observed increasing *P. ochraceus* numbers at most sites, but some numbers are declining at some sites also. At Crook Point the number was about half of what it was in 2003.

Because of their importance as keystone predators in the intertidal zone (Paine 1966, 1969, Blanchette 2005), it is important to monitor seastars. Their numbers can be highly variable however because they are highly mobile on the reef. Timed counts of the seastars on the reef are not ideal because there is no standard density measurement that can be used for comparison between sites. There are also problems with variability between observers and weather/tide conditions. However, the counts will give some level of abundance on at least a gross scale and we don't have a better way to monitor these mobile animals. Size frequency measures will provide information about the population structure and where it may be headed.

Haliotis cracherodii numbers are so low that the fixed plots established to monitor them are no longer effective (as has been the case for over a decade). Two black abalone were found in fixed plots at Otter Harbor in spring 2004, but neither was seen in the fall sampling. As with the seastars, timed counts have their limitations but do provide a measure of presence/absence and relative abundance. We have tried to define the reef area so that the timed counts are done with some consistency. Variability between observers is one of the hardest things to overcome. With the timed counts, a large area is covered and someone without as much experience may not know where to focus their search. Even with experienced people, heavy surf or high winds can affect the apparent tide and the ability to search in exposed crevices.

Small snails, limpets, and chitons all play important roles in the intertidal community as grazers and predators. The motile invertebrate count methodology is becoming a more refined and is being used by many of the MARINE groups. We are beginning to see some patterns of distribution among the different zones, and variations among densities between sites. Further analysis is required though.

Heavy rains fell in December 2004 and January 2005. The early January storms in particular caused a lot of flooding on the mainland with huge amounts of debris washing down the rivers. During the storms, the Santa Clara River was reported at 100,000 cfs (Ventura County Watershed Protection District 2006). Beaches were covered with large amounts of *Arundo donax*, willows, and trash. Some of the sticks were covered with fresh tar (Rich and Richards 2005) (Figure 19).

Around the same time, there was also an oil "incident" along the Santa Barbara coast beginning after the storms (first reports around Jan 11 or 12, 2005). The source of the oil was never positively identified; leakage from oilfields inland of Carpinteria were suspected early on, but the final conclusion was that it was an unusually large release from a natural seep near Coal Oil Point. Approximately 1,500 birds, mostly grebes, were oiled. Birds were taken to Oiled Wildlife Care Center in San Pedro. We did see fresh oil on the beach at Frenchy's Cove in late January but the source was unknown. Tar cover in plots at Fraser Cove decreased slightly in the fall sample, but that was in November before the event.

While no direct damage to the rocky intertidal zone oil or debris was recorded at any of the monitoring sites, these events do illustrate the variability of this environment and the potential

perturbations that can occur. Floating logs do have a direct effect when they strike a reef crushing animals and scraping the substrate. While none were observed on any rocky reefs in 2004, some fairly large logs were found on beaches throughout the islands. Smaller debris may also cause impacts. Unseen chemical pollutants may also be washing out of mainland drainages and beaches. We did not observe unusual tar abundance except the small amount of fresh tar at Frenchy's Cove.



Figure 19. Debris on beach at Frenchy's Cove Anacapa Island.

Pigs have been observed foraging in the intertidal before, eating mussels on the reef at Prisoner's Harbor especially. In 2004, mussels were almost entirely gone from the top of the reef there, and pigs were again suspected of having caused the damage. Though we did not witness pigs in the intertidal zone, a visitor did report that he saw pigs eating mussels from the tidepools on Santa Cruz Island in a website posting² in April. During the spring visit, most of the mussels on the flat portion of the reef at Prisoner's Harbor were completely gone, though mussels in narrow vertical surfaces that would have been difficult for pigs to reach were doing fine.

²Posted by Ed (206.217.11.207) on April 19, 2004, Channel Islands National Park chat room at 16:44:32: In Reply to: [damage](#) posted by Ed on April 12, 2004 at 12:17:45: "Saw pigs eating mussels from the tidepools on Sta. Cruz recently. Add destruction of the intertidal zone to the list of damage pigs cause."

During the later part of 2004, the NOAA climate prediction Center reported temperature anomalies slightly above average (NOAA Climate Prediction Center website). The temperature logger data that we collected with PISCO in 2004 have not been analyzed. The graphs presented in the trip reports (Appendix C) are raw data including all measurements taken during both high and low tides. The loggers are in plastic housings that are exposed during the low tide and may have been variably exposed to direct sun and heating. These may be realistic temperatures that intertidal organisms are exposed to but further analysis should be done. Most loggers exposed to the sun recorded temperatures between 10 and 35°C. A logger placed below the wharf at Santa Barbara Island's Landing Cove was more moderate with temperatures between 8 and 23°C.

Some unusual natural history observations were made in 2004. Small pelagic snail shells of *Janthina janthina* were found on the beach at Coches Prietos, Santa Cruz Island in March. *Velella velella* were washed up in abundance on Simonton Cove Beach, San Miguel Island and on Skunk Point, Santa Rosa Island in spring of 2004. Both of those species are open-ocean species, not commonly seen washed ashore. Their presence may indicate that ocean currents were on shore at the islands which could possibly impact the retention of larvae and possibly increase recruitment of invertebrates and algae. Two brown algal species not commonly found south of Point Conception were seen at San Miguel Island. *Analipus japonica* was seen at Crook Point and *Costaria costata* was common at Harris Point. Both of these species have been seen there before, however it is worth noting because they are uncommon and may indicate upwelling conditions and colder nearshore water, which may also be expressed as increased recruitment of various species.

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Appendix A: Program Notes

Dan Richards and Paula Rich led the 2004 sampling effort and conducted most of the samples. In 2004 we conducted beachwalk surveys primarily to locate and enumerate carcasses on the island beaches to learn about potential food sources for bald eagles as part of their re-introduction to the Channel Islands (Rich and Richards 2005). The beachwalk surveys were funded by the Montrose Settlement Restoration Program and were done on the two western islands in conjunction with the rocky intertidal monitoring trips.

We had the NOAA Vessel Shearwater scheduled for 6 days in early January to take us to Anacapa and Santa Cruz on day trips for the fall monitoring. We were only able to get to two of the sites that week. We got two makeup days on the Shearwater later in January but couldn't sample the third site due to the lost days. We had been unable to get boat support to conduct the spring season monitoring at Anacapa/ East Santa Cruz Island sites. Orizaba Cove got missed in both seasons but was the only site not sampled at least once in 2004.

Rough conditions also prevented us from doing some of the sea star and black abalone counts. Some of the counts that were done may have been marginal because of the high surf or tides and these were noted in the field logs. Often when we experience high surf, the tide does not drop as low as predicted and our window of opportunity is shortened. Because of the number of sites we monitor, there is usually no opportunity to return to a site on a second day to complete the sampling. We sampled at South Frenchy's Cove on June 7. Normally we try to complete sampling by the end of May but we had been unable to get to Anacapa because of logistical issues primarily. The only Anacapa site we sampled in spring was SFC and we were only on site for 45 minutes.

At Trailer, Surfgrass Transect 1 and Mussel Zone plot 1 were not located and thus not sampled during the fall sampling because of overgrowth. One of the *Endocladia* plots (#255) was not photographed in the fall sample. As mentioned in the results, plot 531 at Ford Point was on part of the reef that broke away and overturned. Lottia Plot 5 at Willows Anchorage was not located in the fall, so no count was done in that plot.

The Coastal Biodiversity Survey (aka. SWAT) team was with us at Santa Rosa Island during December 2004 to conduct the biodiversity surveys at four of the sites (Ford Point was not sampled). This was the second survey at these sites; the previous sampling was done in December, 2001(see Coastal Biodiversity website). The Coastal Biodiversity Survey transects are marked by bolts in the rock and overlay the NPS monitoring sites, except at Northwest-Talcott and Fossil Reef where the surveys are set up on adjacent reefs. We measured tidal heights of the NPS plots at the sites whenever possible. Biodiversity Surveys were done at two of the Santa Cruz Island sites in January 2004, as reported in Richards and Rich 2009. We also worked with the UCSB PISCO (Partnership for Interdisciplinary Studies of Coastal Oceans) group at Santa Cruz Island in collecting seastar data and collecting barnacle and mussel recruitment samples. We also maintained temperature loggers at several sites for PISCO.

2004 was first year of using only digital images for the monitoring. In the field we find the camera lighter and easier to use than film cameras. The digital image quality can be checked in the field, though with virtually no limit to the number of images we can shoot in a day back up

images are easily taken and we are more inclined to take extra site documentation photos. We were not set up with artificial lighting with this camera. That may be a consideration for future sampling, but the camera seems to be more light-sensitive than film and additional flash may not be needed. We did find that the high contrast of shadows on sunny days affects the image quality. By shading the plot (using a commercial semi-transparent screen), we reduced the contrast and gained much improved results. For the same reason we find that foggy days with bright flat light are the ideal condition for photographing plots and the site overviews.

Plots not scored in the field were scored on the computer. Methods were adopted for overlaying points on the photoplot images using software (Photoshop) so the images could be scored on the computer. This was an improvement over scoring slides in a dark room. Working at a computer is more convenient and more comfortable. The image can be adjusted to improve light levels and contrast and the image can be enlarged to zoom in on an object. Also the grid overlay can be fixed to the image for rescoring the same points later. This is advantageous for training and quality control. Digital images also have advantages of ease of storage and duplication. A significant effort went into scanning and cataloging the extensive collection of past data slides.

Santiago Arredondo was hired as an intern through the Student Conservation Association (SCA). Santiago set up the system for cataloging images using Extensis Portfolio software. Thousands of 35mm slides dating back to 1982 were scanned and labeled as part of this project. Most important was the establishment of a system to consistently label and catalog the new data images coming in from the field. Rocky Rudolph was hired as an SCA intern to continue the work after Santiago.

One of the physical photoplots at Ford Point was lost when the sandstone reef broke apart and rolled inshore. This was a dramatic demonstration of how these reefs can change in time. Observing some of the bolts placed into the rock at sites with sandstone, one can see several centimeters of erosion during the last 18 years. Sometimes the change is obvious with most of the living organisms scoured off to be replaced briefly by ephemeral algae before the animals quickly move back in. More often, the change is subtle, with only minor changes appearing in a plot from season to season. Sea Urchins, limpets, and turban snails wear down the rock face with their feeding. Mussel shells rock back and forth in the waves, slowly eroding the rock below. These organisms can move or reattach themselves though. Even large pieces of missing rock may not be obvious for long as it is quickly colonized. Being there to document these sorts of changes while they are visible is an important reason to continue with monitoring twice a year.

Appendix B. Photoquadrat Data Tables

Percent cover of selected taxa in fixed 50 x 75 cm photoquadrats based on 100 points per plot. Target taxa are presented in the tables for each site and each sampling (spring and fall). Acorn barnacle taxon includes *Balanus glandula* and *Chthamalus fissus/dalli*. *Pollicipes polymerus* is listed as leaf barnacle. Turf-weed taxon is only used at Landing Cove Santa Barbara Island and includes *Chondracanthus (Gigartina) canaliculatus*, *Gelidium* sp. and *Pterocliadiella capillacea*. The mussel taxon is *Mytilus* spp. with *Mytilus californianus* dominating at all sites. In 2004, horse mussels, *Septifer bifurcates* or *Brachidontes adamsianus* were scored as their own category, but are included in miscellaneous invertebrates in the tables. Misc. Algae and Misc. Animals include a variety of different species. Since 2001 we have identified most organisms to the species level and have added to them to the database; however, because most are rare and for ease of comparison to past data, they are lumped here for convenience. Bare Rock is just that, however we had no way to detect the presence of Cyanobacteria. The *Other* category is a “catch-all” category including unidentified points, but is mostly used for *Phyllospadix* spp.

**Table B1. Percent Cover of Index Species
S Frenchy's Cove, Anacapa Island - Spring 2004 (6/7/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	249	32	28	0	39	1	0	0	0	0	0	0	0	0	100
	250	31	34	0	35	0	0	0	0	0	0	0	0	0	100
	251	42	45	0	13	0	0	0	0	0	0	0	0	0	100
	252	47	36	0	17	0	0	0	0	0	0	0	0	0	100
	253	27	22	0	39	12	0	0	0	0	0	0	0	0	100
	Mean	35.80	33.00	.00	28.60	2.60	.00	.00	.00	.00	.00	.00	.00	.00	100.00
	StDev	8.35	8.66	.00	12.60	5.27	.00	.00	.00	.00	.00	.00	.00	.00	.00
Endocladia	154	15	12	0	72	0	0	0	0	0	0	0	0	1	100
	155	9	2	0	70	0	19	0	0	0	0	0	0	0	100
	256	30	3	0	52	7	6	0	0	0	0	0	0	2	100
	257	25	2	0	70	0	0	0	0	0	0	0	0	3	100
	258	8	2	0	49	0	40	0	0	0	0	0	0	1	100
	Mean	17.40	4.20	.00	62.60	1.40	13.00	.00	.00	.00	.00	.00	.00	1.40	100.00
	StDev	9.76	4.38	.00	11.13	3.13	16.97	.00	.00	.00	.00	.00	.00	1.14	.00
Silvetia (Rockweed)	259	2	0	0	0	0	98	0	0	0	0	0	0	0	100
	260	15	4	0	7	2	72	0	0	0	0	0	0	0	100
	261	14	1	0	1	0	79	0	0	0	5	0	0	0	100
	262	49	18	0	15	0	14	0	0	0	4	0	0	0	100
	263	7	0	0	2	0	86	0	0	0	5	0	0	0	100
	Mean	17.40	4.60	.00	5.00	.40	69.80	.00	.00	.00	2.80	.00	.00	.00	100.00
	StDev	18.45	7.67	.00	6.20	.89	32.64	.00	.00	.00	2.59	.00	.00	.00	.00
Mussels	201	0	0	0	2	0	0	91	2	0	5	0	0	0	100
	202	2	1	0	1	0	0	91	2	0	2	0	0	1	100
	264	0	0	0	0	0	0	94	2	1	2	0	0	1	100
	265	0	0	0	0	0	0	100	0	0	0	0	0	0	100
	266	9	3	0	0	0	0	87	0	0	0	0	0	1	100
	Mean	2.20	.80	.00	.60	.00	.00	92.60	1.20	.20	1.80	.00	.00	.60	100.00
	StDev	3.90	1.30	.00	.89	.00	.00	4.83	1.10	.45	2.05	.00	.00	.55	.00

B-2

**Table B2. Percent Cover of Index Species
Crook Point, San Miguel Island - Spring 2004 (5/9/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-3	Chthamalus/Balanus	137	85	15	0	0	0	0	0	0	0	0	0	0	100
		147	60	40	0	0	0	0	0	0	0	0	0	0	100
		148	63	37	0	0	0	0	0	0	0	0	0	0	100
		149	41	54	0	3	0	2	0	0	0	0	0	0	100
		495	28	63	0	7	0	1	0	0	0	1	0	0	100
	Mean	55.40	41.80	.00	2.00	.00	.00	.60	.00	.00	.00	.20	.00	.00	100.00
	StDev	21.87	18.32	.00	3.08	.00	.00	.89	.00	.00	.00	.45	.00	.00	.00
	Endocladia	386	45	10	0	30	11	0	0	1	3	0	0	0	100
		387	17	41	1	28	0	0	0	3	8	2	0	0	100
		388	10	17	0	58	12	0	0	0	3	0	0	0	100
		389	26	9	3	21	6	1	27	0	5	1	0	0	100
		390	40	22	0	16	1	0	18	0	2	1	0	0	100
	Mean	27.60	19.80	.80	30.60	6.00	.20	9.00	.00	1.40	4.00	.60	.00	.00	100.00
	StDev	14.84	12.99	1.30	16.30	5.52	.45	12.73	.00	1.14	2.65	.89	.00	.00	.00
	Silvetia (Rockweed)	396	27	19	0	23	5	2	18	0	3	0	0	0	100
		397	6	0	0	0	0	0	94	0	0	0	0	0	100
		398	41	18	0	6	0	2	21	0	2	10	0	0	100
		399	41	16	3	2	0	1	2	8	0	26	1	0	100
		400	70	4	4	16	2	0	0	0	4	0	0	0	100
	Mean	37.00	11.40	1.40	9.40	1.40	1.00	27.00	1.60	1.00	8.60	.20	.00	.00	100.00
	StDev	23.36	8.76	1.95	9.79	2.19	1.00	38.60	3.58	1.41	10.38	.45	.00	.00	.00
	Mussels	381	7	13	1	1	0	51	3	0	23	1	0	0	100
		382	1	0	0	0	0	99	0	0	0	0	0	0	100
		383	4	0	0	0	0	90	0	0	6	0	0	0	100
		384	6	5	0	0	0	88	0	0	1	0	0	0	100
		385	7	7	1	0	0	75	0	7	3	0	0	0	100
	Mean	5.00	5.00	.40	.20	.00	.00	80.60	.60	1.40	6.60	.20	.00	.00	100.00
	StDev	2.55	5.43	.55	.45	.00	.00	18.64	1.34	3.13	9.45	.45	.00	.00	.00

**Table B3. Percent Cover of Index Species
Cuyler Harbor, San Miguel Island - Spring 2004 (5/7/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-4	Chthamalus/Balanus	416	28	66	0	5	0	0	0	0	1	0	0	0	100
		417	26	41	0	33	0	0	0	0	0	0	0	0	100
		418	21	61	0	18	0	0	0	0	0	0	0	0	100
		419	46	17	0	37	0	0	0	0	0	0	0	0	100
		420	34	10	0	56	0	0	0	0	0	0	0	0	100
	Mean	31.00	39.00	.00	29.80	.00	.00	.00	.00	.00	.20	.00	.00	.00	100.00
	StDev	9.59	25.21	.00	19.38	.00	.00	.00	.00	.00	.45	.00	.00	.00	.00
	Endocladia	411	40	0	2	31	0	16	0	1	8	2	0	0	100
		412	10	13	0	34	0	12	2	0	29	0	0	0	100
		413	18	1	0	22	0	1	0	0	8	1	0	0	100
		414	16	0	0	68	0	0	0	0	16	0	0	0	100
		415	22	0	0	52	0	1	1	0	23	1	0	0	100
	Mean	21.20	2.80	.40	41.40	.00	10.00	5.80	.60	.20	16.80	.80	.00	.00	100.00
	StDev	11.37	5.72	.89	18.43	.00	21.81	7.63	.89	.45	9.26	.84	.00	.00	.00
	Silvetia (Rockweed)	406	23	0	0	0	46	1	1	0	22	7	0	0	100
		407	11	0	0	0	81	1	0	0	5	2	0	0	100
		408	11	0	0	1	73	0	0	0	12	3	0	0	100
		409	6	0	0	0	82	0	0	0	12	0	0	0	100
		410	21	0	2	0	62	0	0	0	9	6	0	0	100
	Mean	14.40	.00	.40	.20	.00	68.80	.40	.20	.00	12.00	3.60	.00	.00	100.00
	StDev	7.27	.00	.89	.45	.00	15.06	.55	.45	.00	6.28	2.88	.00	.00	.00
	Mussels	401	9	1	2	0	0	79	0	6	0	3	0	0	100
		402	8	0	0	0	0	83	0	2	4	3	0	0	100
		403	8	1	3	0	0	70	0	3	4	11	0	0	100
		404	31	5	9	0	0	29	0	3	11	12	0	0	100
		405	41	2	6	0	0	28	0	5	9	9	0	0	100
	Mean	19.40	1.80	4.00	.00	.00	.00	57.80	.00	3.80	5.60	7.60	.00	.00	100.00
	StDev	15.57	1.92	3.54	.00	.00	.00	27.16	.00	1.64	4.39	4.34	.00	.00	.00

**Table B4. Percent Cover of Index Species
Harris Point, San Miguel Island - Spring 2004 (5/8/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-5	Chthamalus/Balanus	440	22	73	0	5	0	0	0	0	0	0	0	0	100
		441	33	66	0	1	0	0	0	0	0	0	0	0	100
		442	9	87	0	4	0	0	0	0	0	0	0	0	100
		443	45	50	0	0	0	0	0	0	0	0	5	0	100
		444	48	50	0	1	0	0	0	0	0	1	0	0	100
		Mean	31.40	65.20	.00	2.20	.00	.00	.00	.00	.00	.20	1.00	.00	100.00
		StDev	16.23	15.80	.00	2.17	.00	.00	.00	.00	.00	.45	2.24	.00	.00
	Endocladia	431	17	29	1	33	3	12	1	0	4	0	0	0	100
		432	19	29	1	24	15	0	1	0	11	0	0	0	100
		433	23	37	2	26	9	0	0	0	3	0	0	0	100
		434	47	6	1	39	6	0	0	0	0	1	0	0	100
		435	14	0	0	31	40	0	0	0	15	0	0	0	100
		Mean	24.20	20.20	1.00	30.60	14.60	.00	2.40	.40	.00	.20	.00	.00	100.00
		StDev	13.27	16.18	.71	5.94	14.88	.00	5.37	.55	.00	.45	.00	.00	.00
	Mussels	426	12	1	4	4	0	70	0	0	8	1	0	0	100
		427	22	7	10	21	3	5	0	0	30	2	0	0	100
		428	48	9	3	6	1	8	0	0	25	0	0	0	100
		429	19	19	4	0	0	50	0	1	7	0	0	0	100
		430	10	4	1	0	0	71	0	2	12	0	0	0	100
		Mean	22.20	8.00	4.40	6.20	.80	40.80	.00	.60	16.40	.60	.00	.00	100.00
		StDev	15.24	6.86	3.36	8.67	1.30	32.43	.00	.89	10.45	.89	.00	.00	.00
	Tetraclita	436	20	20	25	0	0	25	0	1	7	2	0	0	100
		437	16	15	13	0	0	26	0	1	7	3	19	0	100
		438	18	0	13	12	0	0	3	0	52	2	0	0	100
		439	10	35	4	12	0	1	0	0	38	0	0	0	100
		445	48	10	26	3	0	8	0	0	2	3	0	0	100
		Mean	22.40	16.00	16.20	5.40	.00	12.00	.60	.40	21.20	2.00	3.80	.00	100.00
		StDev	14.79	12.94	9.26	6.15	.00	12.71	1.34	.55	22.38	1.22	8.50	.00	.00
	Hesperophycus	421	10	1	0	10	79	0	0	0	0	0	0	0	100
		422	17	2	0	17	57	0	2	0	5	0	0	0	100
		423	11	1	0	28	56	0	0	0	4	0	0	0	100
		424	21	3	0	30	46	0	0	0	0	0	0	0	100
		425	39	0	0	8	52	0	0	0	1	0	0	0	100
		Mean	19.60	1.40	.00	18.60	58.00	.00	.40	.00	2.00	.00	.00	.00	100.00
		StDev	11.74	1.14	.00	10.09	12.51	.00	.89	.00	2.35	.00	.00	.00	.00

**Table B5. Percent Cover of Index Species
Otter Harbor, San Miguel Island - Spring 2004 (5/10/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-6	Chthamalus/Balanus	370	86	11	0	0	0	0	0	0	3	0	0	0	100
		371	12	68	0	0	0	0	0	0	9	0	11	0	100
		372	34	62	0	0	0	0	0	0	1	3	0	0	100
		373	50	45	0	0	0	0	0	0	0	0	5	0	100
		374	21	0	0	0	0	0	24	0	54	1	0	0	100
	Mean	40.60	37.20	.00	.00	.00	.00	.00	4.80	.00	13.40	.80	3.20	.00	100.00
	StDev	29.13	30.39	.00	.00	.00	.00	.00	10.73	.00	22.96	1.30	4.87	.00	.00
	Endocladia	360	10	32	1	33	8	0	0	1	11	0	0	0	100
		361	29	0	0	63	0	0	0	0	5	0	0	0	100
		362	6	0	0	82	0	1	0	1	7	0	0	0	100
		363	6	0	0	73	0	0	1	0	20	0	0	0	100
		364	15	0	0	67	11	1	0	0	6	0	0	0	100
	Mean	13.20	6.40	.20	63.60	3.80	.40	2.00	.20	.40	9.80	.00	.00	.00	100.00
	StDev	9.58	14.31	.45	18.54	5.31	.55	1.87	.45	.55	6.14	.00	.00	.00	.00
	Silvetia (Rockweed)	355	41	6	1	35	0	4	0	0	8	0	5	0	100
		356	16	0	3	25	5	34	0	1	16	0	0	0	100
		357	30	0	1	39	3	8	0	0	18	1	0	0	100
		358	33	30	0	21	8	0	0	0	5	3	0	0	100
		359	20	57	0	7	3	0	0	0	10	1	2	0	100
	Mean	28.00	18.60	1.00	25.40	3.80	9.20	.00	.00	.20	11.40	1.00	1.40	.00	100.00
	StDev	10.07	24.77	1.22	12.60	2.95	14.25	.00	.00	.45	5.46	1.22	2.19	.00	.00
	Mussels	375	14	0	0	0	0	52	0	12	20	2	0	0	100
		376	26	1	1	0	0	49	0	0	20	3	0	0	100
		378	10	0	0	0	0	56	0	4	28	2	0	0	100
		379	22	0	0	0	0	56	0	6	16	0	0	0	100
		380	23	0	1	0	0	50	0	2	23	1	0	0	100
	Mean	19.00	.20	.40	.00	.00	.00	52.60	.00	4.80	21.40	1.60	.00	.00	100.00
	StDev	6.71	.45	.55	.00	.00	.00	3.29	.00	4.60	4.45	1.14	.00	.00	.00

**Table B6. Percent Cover of Index Species
Fraser Cove, Santa Cruz Island - Spring 2004 (3/31/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-7	Chthamalus/Balanus	876	11	50	0	31	0	0	1	0	0	7	0	0	100
		877	13	3	0	20	0	0	2	0	0	62	0	0	100
		878	14	20	0	0	0	0	0	0	0	66	0	0	100
		879	23	45	0	23	0	0	0	0	0	9	0	0	100
		880	1	6	0	7	0	0	0	0	0	86	0	0	100
		Mean	12.40	24.80	.00	16.20	.00	.00	.60	.00	.00	46.00	.00	.00	100.00
		StDev	7.86	21.76	.00	12.52	.00	.00	.89	.00	.00	35.87	.00	.00	.00
	Endocladia	881	16	6	0	46	0	0	4	0	0	28	0	0	100
		882	18	21	0	33	0	0	1	0	0	27	0	0	100
		883	22	3	0	61	12	0	0	0	0	2	0	0	100
		884	17	4	0	78	0	0	0	0	0	1	0	0	100
		885	11	2	0	72	0	0	0	0	0	15	0	0	100
		Mean	16.80	7.20	.00	58.00	2.40	.00	1.00	.00	.00	14.60	.00	.00	100.00
		StDev	3.96	7.85	.00	18.53	5.37	.00	1.73	.00	.00	13.01	.00	.00	.00
	Silvetia (Rockweed)	896	8	0	0	9	12	69	0	1	0	1	0	0	100
		897	22	1	0	6	4	53	0	0	0	14	0	0	100
		898	21	0	0	0	0	74	0	0	0	5	0	0	100
		899	10	0	0	4	17	67	0	0	0	2	0	0	100
		900	17	5	0	7	6	65	0	0	0	0	0	0	100
		Mean	15.60	1.20	.00	5.20	7.80	65.60	.00	.20	.00	4.40	.00	.00	100.00
		StDev	6.35	2.17	.00	3.42	6.72	7.80	.00	.45	.00	5.68	.00	.00	.00
B-7	Mussels	891	13	1	0	0	0	75	0	0	10	1	0	0	100
		892	18	6	0	0	0	70	1	1	4	0	0	0	100
		893	12	1	0	0	0	75	0	0	2	7	0	3	100
		894	6	3	0	0	0	87	0	2	0	2	0	0	100
		895	1	8	0	0	0	82	0	4	4	1	0	0	100
		Mean	10.00	3.80	.00	.00	.00	77.80	.20	1.40	4.00	2.20	.00	.60	100.00
		StDev	6.60	3.11	.00	.00	.00	6.69	.45	1.67	3.74	2.77	.00	1.34	.00
	Pollicipes	901	11	20	1	1	0	53	1	6	6	1	0	0	100
		902	17	8	0	21	0	20	1	9	15	0	0	9	100
		903	8	1	0	0	0	64	1	11	12	2	0	1	100
		904	11	5	5	0	0	64	0	5	8	1	0	1	100
		905	3	0	0	0	0	67	0	18	11	1	0	0	100
		Mean	10.00	6.80	1.20	4.40	.00	53.60	.60	9.80	10.40	1.00	.00	2.20	100.00
		StDev	5.10	8.04	2.17	9.29	.00	19.53	.55	5.17	3.51	.71	.00	3.83	.00

**Table B6. Percent Cover of Index Species
Fraser Cove, Santa Cruz Island - Spring 2004 (3/31/04) (continued)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Tar	906	26	12	0	0	0	0	0	0	0	7	0	54	1	100
	907	32	20	0	0	0	0	0	0	0	6	0	42	0	100
	908	18	21	0	0	0	0	0	0	0	3	0	58	0	100
	909	47	9	0	0	0	0	0	0	0	0	0	44	0	100
	910	26	5	0	0	0	0	0	0	0	0	0	69	0	100
	Mean	29.80	13.40	.00	.00	.00	.00	.00	.00	.00	3.20	.00	53.40	.20	100.00
	StDev	10.83	6.95	.00	.00	.00	.00	.00	.00	.00	3.27	.00	10.99	.45	.00
Hesperophycus	886	49	0	0	21	28	0	0	0	0	1	0	0	1	100
	887	50	3	0	18	18	0	0	0	0	11	0	0	0	100
	888	22	5	0	24	46	3	0	0	0	0	0	0	0	100
	889	40	7	0	19	30	4	0	0	0	0	0	0	0	100
	890	32	3	0	28	12	25	0	0	0	0	0	0	0	100
	Mean	38.60	3.60	.00	22.00	26.80	6.40	.00	.00	.00	2.40	.00	.00	.20	100.00
	StDev	11.82	2.61	.00	4.06	13.01	10.55	.00	.00	.00	4.83	.00	.00	.45	.00

**Table B7. Percent Cover of Index Species
Prisoner's Harbor, Santa Cruz Island - Spring 2004 (3/29/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-9	Chthamalus/Balanus	826	95	0	0	0	0	0	0	0	5	0	0	0	100
		827	21	4	0	1	0	6	0	0	67	1	0	0	100
		828	19	21	0	32	0	2	0	0	26	0	0	0	100
		829	29	17	0	34	0	1	0	0	19	0	0	0	100
		830	10	8	0	18	1	0	0	0	63	0	0	0	100
	Mean	34.80	10.00	.00	17.00	.20	.00	1.80	.00	.00	36.00	.20	.00	.00	100.00
	StDev	34.32	8.80	.00	16.28	.45	.00	2.49	.00	.00	27.57	.45	.00	.00	.00
	Endocladia	831	19	4	0	66	0	9	0	0	2	0	0	0	100
		832	3	16	0	72	5	3	0	0	0	1	0	0	100
		833	9	26	0	61	2	2	0	0	0	0	0	0	100
		834	15	15	0	64	4	2	0	0	0	0	0	0	100
		835	17	3	0	59	17	2	0	0	2	0	0	0	100
	Mean	12.60	12.80	.00	64.40	5.60	.00	3.60	.00	.00	.80	.20	.00	.00	100.00
	StDev	6.54	9.52	.00	5.03	6.66	.00	3.05	.00	.00	1.10	.45	.00	.00	.00
	Silvetia (Rockweed)	846	39	3	0	1	0	16	2	0	39	0	0	0	100
		847	39	5	2	2	0	5	19	0	27	1	0	0	100
		848	17	3	0	4	0	28	5	0	43	0	0	0	100
		849	13	2	0	0	0	47	0	0	36	2	0	0	100
		850	11	1	0	0	0	67	0	0	21	0	0	0	100
	Mean	23.80	2.80	.40	1.40	.00	32.60	5.20	.00	.00	33.20	.60	.00	.00	100.00
	StDev	14.04	1.48	.89	1.67	.00	24.74	7.98	.00	.00	9.01	.89	.00	.00	.00
	Mussels	841	3	2	0	1	0	26	0	0	68	0	0	0	100
		842	21	26	3	7	0	19	1	0	23	0	0	0	100
		843	6	14	0	1	0	75	0	0	4	0	0	0	100
		844	6	3	0	5	0	21	1	0	34	30	0	0	100
		845	7	16	6	2	0	16	0	0	52	1	0	0	100
	Mean	8.60	12.20	1.80	3.20	.00	.00	31.40	.40	.00	36.20	6.20	.00	.00	100.00
	StDev	7.09	9.96	2.68	2.68	.00	.00	24.64	.55	.00	24.88	13.31	.00	.00	.00
	Hesperophycus	836	31	5	0	58	2	0	0	0	4	0	0	0	100
		837	62	2	0	23	2	0	0	0	11	0	0	0	100
		838	55	2	0	28	3	0	0	0	12	0	0	0	100
		839	41	31	0	27	0	1	0	0	0	0	0	0	100
		840	43	17	0	30	6	2	0	0	2	0	0	0	100
	Mean	46.40	11.40	.00	33.20	2.60	.20	.40	.00	.00	5.80	.00	.00	.00	100.00
	StDev	12.20	12.58	.00	14.10	2.19	.45	.89	.00	.00	5.40	.00	.00	.00	.00

**Table B8. Percent Cover of Index Species
Scorpion Rock, Santa Cruz Island - Spring 2004 (3/16/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-10	Chthamalus/Balanus	801	26	24	0	49	0	0	1	0	0	0	0	0	100
		802	No photo available for scoring												
		803	49	10	0	40	0	0	0	0	0	0	0	1	100
		804	37	22	0	40	0	0	0	0	0	0	0	1	100
		805	70	30	0	0	0	0	0	0	0	0	0	0	100
		Mean	36.40	17.20	.00	25.80	.00	.00	.20	.00	.00	.00	.00	.40	80.00
		StDev	26.08	12.05	.00	23.84	.00	.00	.45	.00	.00	.00	.00	.55	44.72
	Endocladia	806	19	2	0	69	0	0	0	0	9	0	0	1	100
		807	3	4	2	64	0	0	3	0	22	0	0	0	100
		808	27	1	0	53	0	0	4	0	11	0	0	0	100
		809	28	6	0	64	0	0	0	0	1	1	0	0	100
		810	65	7	0	19	0	1	0	1	7	0	0	0	100
		Mean	28.40	4.00	.40	53.80	.00	.20	1.40	.00	1.40	10.00	.20	.20	100.00
		StDev	22.78	2.55	.89	20.32	.00	.45	1.95	.00	1.67	7.68	.45	.45	.00
	Mussels	816	6	13	18	0	0	49	0	0	6	8	0	0	100
		817	9	1	2	0	0	86	0	0	2	0	0	0	100
		818	48	22	12	0	0	6	0	1	11	0	0	0	100
		819	25	8	38	8	0	2	0	0	12	1	0	6	100
		820	33	8	12	5	0	4	5	0	33	0	0	0	100
		Mean	24.20	10.40	16.40	2.60	.00	29.40	1.00	.20	12.80	1.80	.00	1.20	100.00
		StDev	17.37	7.77	13.37	3.71	.00	37.19	2.24	.45	11.99	3.49	.00	2.68	.00
	Tetraclita	821	28	14	13	7	0	26	0	9	2	1	0	0	100
		822	40	3	1	12	0	38	0	4	2	0	0	0	100
		823	79	1	8	0	0	1	0	0	10	1	0	0	100
		824	72	0	18	0	0	1	0	0	6	3	0	0	100
		825	58	0	17	0	0	1	0	2	16	3	0	3	100
		Mean	55.40	3.60	11.40	3.80	.00	13.40	.00	3.00	7.20	1.60	.00	.60	100.00
		StDev	21.37	5.94	7.02	5.50	.00	17.50	.00	3.74	5.93	1.34	.00	1.34	.00
	Hesperophycus	811	59	1	0	13	26	0	0	1	0	0	0	0	100
		812	32	0	0	35	20	5	4	0	4	0	0	0	100
		813	15	0	0	24	26	35	0	0	0	0	0	0	100
		814	77	1	0	12	2	7	0	0	1	0	0	0	100
		815	19	0	0	35	30	8	0	0	8	0	0	0	100
		Mean	40.40	.40	.00	23.80	20.80	11.00	.80	.00	2.60	.00	.00	.00	100.00
		StDev	26.74	.55	.00	11.26	11.10	13.77	1.79	.00	3.44	.00	.00	.00	.00

**Table B9. Percent Cover of Index Species
Trailer, Santa Cruz Island - Spring 2004 (4/1/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	911	57	43	0	0	0	0	0	0	0	0	0	0	0	100
	912	54	46	0	0	0	0	0	0	0	0	0	0	0	100
	913	15	60	0	23	0	0	0	0	0	2	0	0	0	100
	914	19	81	0	0	0	0	0	0	0	0	0	0	0	100
	915	19	81	0	0	0	0	0	0	0	0	0	0	0	100
	Mean	32.80	62.20	.00	4.60	.00	.00	.00	.00	.00	.40	.00	.00	.00	100.00
	StDev	20.81	18.32	.00	10.29	.00	.00	.00	.00	.00	.89	.00	.00	.00	.00
Silvetia (Rockweed)	926	7	1	0	0	0	87	0	0	0	5	0	0	0	100
	927	17	3	0	0	0	78	0	0	0	2	0	0	0	100
	928	18	0	0	3	0	74	0	0	0	5	0	0	0	100
	929	7	0	0	0	0	86	0	0	0	7	0	0	0	100
	930	7	0	0	0	0	91	0	0	0	2	0	0	0	100
	Mean	11.20	.80	.00	.60	.00	83.20	.00	.00	.00	4.20	.00	.00	.00	100.00
	StDev	5.76	1.30	.00	1.34	.00	6.98	.00	.00	.00	2.17	.00	.00	.00	.00
Mussels	921	18	11	1	1	0	0	0	0	0	69	0	0	0	100
	922	11	9	0	0	0	0	53	0	0	26	1	0	0	100
	923	10	6	0	0	0	0	77	0	1	6	0	0	0	100
	924	18	5	1	0	0	0	74	0	0	2	0	0	0	100
	925	9	6	2	0	0	0	79	0	1	3	0	0	0	100
	Mean	13.20	7.40	.80	.20	.00	.00	56.60	.00	.40	21.20	.20	.00	.00	100.00
	StDev	4.44	2.51	.84	.45	.00	.00	33.31	.00	.55	28.46	.45	.00	.00	.00
Hesperophycus	916	40	4	0	25	5	25	0	0	0	1	0	0	0	100
	917	10	10	0	21	3	56	0	0	0	0	0	0	0	100
	918	20	0	0	21	24	35	0	0	0	0	0	0	0	100
	919	76	6	0	7	1	10	0	0	0	0	0	0	0	100
	920	32	6	0	39	12	5	0	0	0	6	0	0	0	100
	Mean	35.60	5.20	.00	22.60	9.00	26.20	.00	.00	.00	1.40	.00	.00	.00	100.00
	StDev	25.31	3.63	.00	11.44	9.35	20.49	.00	.00	.00	2.61	.00	.00	.00	.00

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**Table B10. Percent Cover of Index Species
Willows Anchorage, Santa Cruz Island - Spring 2004 (3/30/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Endocladia	931	28	1	0	71	0	0	0	0	0	0	0	0	0	100
	932	36	3	0	61	0	0	0	0	0	0	0	0	0	100
	933	49	3	0	43	0	0	0	0	0	4	1	0	0	100
	934	21	7	0	54	0	0	15	0	0	3	0	0	0	100
	935	39	9	3	33	0	0	0	0	0	16	0	0	0	100
	Mean	34.60	4.60	.60	52.40	.00	.00	3.00	.00	.00	4.60	.20	.00	.00	100.00
	StDev	10.69	3.29	1.34	14.89	.00	.00	6.71	.00	.00	6.62	.45	.00	.00	.00
Silvetia (Rockweed)	946	10	0	0	80	0	0	0	0	0	10	0	0	0	100
	947	39	7	1	47	0	0	0	0	0	6	0	0	0	100
	948	7	1	0	2	0	85	0	0	0	5	0	0	0	100
	949	0	0	0	0	0	100	0	0	0	0	0	0	0	100
	950	45	10	0	17	0	2	0	0	0	26	0	0	0	100
	Mean	20.20	3.60	.20	29.20	.00	37.40	.00	.00	.00	9.40	.00	.00	.00	100.00
	StDev	20.34	4.62	.45	34.05	.00	50.58	.00	.00	.00	9.94	.00	.00	.00	.00
Mussels	941	8	10	15	0	0	0	56	0	6	5	0	0	0	100
	942	4	0	0	0	0	0	87	0	3	3	3	0	0	100
	943	2	0	0	0	0	0	94	0	3	1	0	0	0	100
	944	4	1	0	0	0	0	93	0	2	0	0	0	0	100
	945	0	0	0	0	0	0	99	0	1	0	0	0	0	100
	Mean	3.60	2.20	3.00	.00	.00	.00	85.80	.00	3.00	1.80	.60	.00	.00	100.00
	StDev	2.97	4.38	6.71	.00	.00	.00	17.20	.00	1.87	2.17	1.34	.00	.00	.00
Hesperophycus	936	38	2	0	59	1	0	0	0	0	0	0	0	0	100
	937	77	9	0	0	0	4	1	0	0	9	0	0	0	100
	938	74	7	0	4	0	0	0	0	0	15	0	0	0	100
	939	10	1	0	0	3	83	0	0	0	3	0	0	0	100
	940	15	2	0	8	17	52	0	0	0	6	0	0	0	100
	Mean	42.80	4.20	.00	14.20	4.20	27.80	.20	.00	.00	6.60	.00	.00	.00	100.00
	StDev	31.68	3.56	.00	25.26	7.26	37.90	.45	.00	.00	5.77	.00	.00	.00	.00

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**Table B11. Percent Cover of Index Species
East Point, Santa Rosa Island - Spring 2004 (4/9/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-13	Chthamalus/Balanus	575	74	23	0	1	0	0	0	0	0	2	0	0	100
		576	21	4	0	5	68	0	0	0	2	0	0	0	100
		577	13	29	0	42	8	8	0	0	0	0	0	0	100
		578	82	17	0	0	0	0	0	0	0	0	1	0	100
		579	70	27	0	3	0	0	0	0	0	0	0	0	100
	Mean	52.00	20.00	.00	10.20	15.20	1.60	.00	.00	.00	.40	.40	.20	.00	100.00
	StDev	32.37	10.05	.00	17.88	29.72	3.58	.00	.00	.00	.89	.89	.45	.00	.00
	Endocladia	580	13	0	0	11	50	22	0	0	4	0	0	0	100
		581	5	0	0	19	72	1	0	0	3	0	0	0	100
		582	14	0	0	39	29	18	0	0	0	0	0	0	100
B-13		583	4	2	0	71	22	0	0	0	1	0	0	0	100
		584	13	0	0	48	37	2	0	0	0	0	0	0	100
	Mean	9.80	.40	.00	37.60	42.00	8.60	.00	.00	.00	1.60	.00	.00	.00	100.00
	StDev	4.87	.89	.00	23.87	19.74	10.53	.00	.00	.00	1.82	.00	.00	.00	.00
	Silvetia (Rockweed)	585	11	0	0	3	0	64	0	0	20	2	0	0	100
		586	22	0	0	8	1	51	0	0	16	2	0	0	100
		587	23	0	0	0	0	44	0	0	30	3	0	0	100
		588	3	0	0	0	0	86	0	0	7	4	0	0	100
		589	1	0	0	0	0	80	1	0	18	0	0	0	100
	Mean	12.00	.00	.00	2.20	.20	65.00	.20	.00	.00	18.20	2.20	.00	.00	100.00
B-13	StDev	10.30	.00	.00	3.49	.45	18.06	.45	.00	.00	8.26	1.48	.00	.00	.00
	Mussels	590	2	3	0	1	0	60	3	1	27	3	0	0	100
		591	0	25	0	1	0	41	6	1	15	11	0	0	100
		592	0	0	0	0	0	84	0	0	12	4	0	0	100
		593	1	0	0	0	0	94	0	0	4	1	0	0	100
		594	3	0	0	1	0	95	0	0	1	0	0	0	100
	Mean	1.20	5.60	.00	.60	.00	.00	74.80	1.80	.40	11.80	3.80	.00	.00	100.00
	StDev	1.30	10.92	.00	.55	.00	.00	23.57	2.68	.55	10.23	4.32	.00	.00	.00
	Hesperophycus	570	18	0	0	25	51	2	0	0	4	0	0	0	100
		571	28	4	0	13	53	0	0	0	2	0	0	0	100
B-13		572	19	1	0	4	73	2	0	0	1	0	0	0	100
		573	19	0	0	7	67	7	0	0	0	0	0	0	100
		574	35	2	0	21	21	13	0	0	6	2	0	0	100
	Mean	23.80	1.40	.00	14.00	53.00	4.80	.00	.00	.00	2.60	.40	.00	.00	100.00
	StDev	7.46	1.67	.00	8.94	20.15	5.26	.00	.00	.00	2.41	.89	.00	.00	.00

**Table B12. Percent Cover of Index Species
Ford Point, Santa Rosa Island - Spring 2004 (4/10/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	520	68	23	0	0	0	0	0	0	0	0	9	0	0	100
	521	52	44	0	0	0	0	1	0	0	0	3	0	0	100
	522	74	26	0	0	0	0	0	0	0	0	0	0	0	100
	523	33	20	0	45	0	0	0	0	0	0	2	0	0	100
	524	65	33	0	0	0	0	0	0	0	0	2	0	0	100
	Mean	58.40	29.20	.00	9.00	.00	.00	.20	.00	.00	.00	3.20	.00	.00	100.00
	StDev	16.32	9.58	.00	20.12	.00	.00	.45	.00	.00	.00	3.42	.00	.00	.00
Endocladia	525	12	2	0	67	0	0	7	0	0	11	1	0	0	100
	526	21	8	0	57	0	0	7	1	0	4	2	0	0	100
	527	35	2	0	35	0	0	6	1	0	21	0	0	0	100
	528	11	5	1	56	0	0	1	0	1	23	2	0	0	100
	529	32	4	1	52	0	0	0	1	0	9	1	0	0	100
	Mean	22.20	4.20	.40	53.40	.00	.00	4.20	.60	.20	13.60	1.20	.00	.00	100.00
	StDev	11.08	2.49	.55	11.67	.00	.00	3.42	.55	.45	8.11	.84	.00	.00	.00
Mussels	530	57	19	0	0	0	0	12	0	0	2	10	0	0	100
	531	24	25	0	0	0	0	17	1	0	29	4	0	0	100
	532	2	1	0	1	0	0	93	0	0	0	3	0	0	100
	533	28	0	0	0	0	0	57	0	1	13	1	0	0	100
	534	27	12	0	0	0	0	0	28	0	24	9	0	0	100
	Mean	27.60	11.40	.00	.20	.00	.00	35.80	5.80	.20	13.60	5.40	.00	.00	100.00
	StDev	19.58	10.97	.00	.45	.00	.00	38.48	12.42	.45	12.90	3.91	.00	.00	.00

**Table B13. Percent Cover of Index Species
Fossil Reef, Santa Rosa Island - Spring 2004 (4/13/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	605	63	35	0	0	0	0	0	0	0	2	0	0	0	100
	606	50	35	0	0	0	0	0	0	0	4	0	11	0	100
	607	59	31	0	0	0	0	0	0	0	6	3	1	0	100
	608	84	14	0	0	0	0	0	0	0	2	0	0	0	100
	609	74	18	0	0	0	0	0	0	0	6	1	1	0	100
	Mean	66.00	26.60	.00	.00	.00	.00	.00	.00	.00	4.00	.80	2.60	.00	100.00
	StDev	13.25	9.91	.00	.00	.00	.00	.00	.00	.00	2.00	1.30	4.72	.00	.00
Endocladia	610	41	26	0	29	0	0	0	0	0	4	0	0	0	100
	611	44	51	0	1	0	0	0	0	0	2	2	0	0	100
	612	74	4	0	0	0	1	0	0	0	19	2	0	0	100
	613	22	6	0	64	0	6	0	0	0	2	0	0	0	100
	614	55	2	0	3	0	24	0	0	0	14	2	0	0	100
	Mean	47.20	17.80	.00	19.40	.00	6.20	.00	.00	.00	8.20	1.20	.00	.00	100.00
	StDev	19.12	20.91	.00	27.68	.00	10.26	.00	.00	.00	7.82	1.10	.00	.00	.00
Silvetia (Rockweed)	615	73	18	0	1	0	0	0	0	0	7	1	0	0	100
	616	67	13	0	8	0	0	0	0	0	8	4	0	0	100
	617	62	4	0	12	0	9	0	0	0	13	0	0	0	100
	618	46	0	0	13	0	26	0	0	0	13	2	0	0	100
	619	30	1	0	24	0	41	0	0	0	3	1	0	0	100
	Mean	55.60	7.20	.00	11.60	.00	15.20	.00	.00	.00	8.80	1.60	.00	.00	100.00
	StDev	17.47	7.92	.00	8.38	.00	17.91	.00	.00	.00	4.27	1.52	.00	.00	.00
Mussels	620	9	0	2	0	0	0	19	3	0	47	20	0	0	100
	621	6	5	6	0	0	0	1	3	0	62	17	0	0	100
	622	20	11	21	2	0	0	18	0	1	23	4	0	0	100
	623	16	1	6	0	0	0	47	0	10	18	2	0	0	100
	624	0	1	1	0	0	0	1	32	0	31	34	0	0	100
	Mean	10.20	3.60	7.20	.40	.00	.00	17.20	7.60	2.20	36.20	15.40	.00	.00	100.00
	StDev	7.95	4.56	8.04	.89	.00	.00	18.82	13.72	4.38	18.13	13.03	.00	.00	.00

**Table B14. Percent Cover of Index Species
Johnson's Lee, Santa Rosa Island - Spring 2004 (4/11/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	500	55	44	0	0	0	0	0	0	0	1	0	0	0	100
	501	37	62	0	0	0	0	0	0	0	0	1	0	0	100
	502	71	28	0	0	0	0	1	0	0	0	0	0	0	100
	503	21	48	0	31	0	0	0	0	0	0	0	0	0	100
	504	49	27	0	6	0	0	1	0	0	10	7	0	0	100
	Mean	46.60	41.80	.00	7.40	.00	.00	.40	.00	.00	2.20	1.60	.00	.00	100.00
	StDev	18.84	14.67	.00	13.45	.00	.00	.55	.00	.00	4.38	3.05	.00	.00	.00
Endocladia	505	37	4	0	29	0	0	24	0	0	5	1	0	0	100
	506	39	17	1	42	0	0	0	0	0	0	1	0	0	100
	507	46	10	0	28	0	0	14	0	0	2	0	0	0	100
	508	18	17	0	42	0	0	19	0	2	1	1	0	0	100
	509	35	10	1	50	0	0	0	0	0	3	1	0	0	100
	Mean	35.00	11.60	.40	38.20	.00	.00	11.40	.00	.40	2.20	.80	.00	.00	100.00
	StDev	10.37	5.50	.55	9.44	.00	.00	10.99	.00	.89	1.92	.45	.00	.00	.00
Mussels	510	1	1	0	0	0	0	0	14	0	20	64	0	0	100
	511	0	0	0	0	0	0	2	0	0	1	97	0	0	100
	512	18	1	1	0	0	0	73	0	2	5	0	0	0	100
	513	17	2	0	0	0	0	2	21	0	19	39	0	0	100
	514	11	0	0	0	0	0	0	2	0	22	65	0	0	100
	Mean	9.40	.80	.20	.00	.00	.00	15.40	7.40	.40	13.40	53.00	.00	.00	100.00
	StDev	8.56	.84	.45	.00	.00	.00	32.21	9.58	.89	9.66	36.08	.00	.00	.00

**Table B15. Percent Cover of Index Species
NW Talcott, Santa Rosa Island - Spring 2004 (4/12/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	560	48	49	0	1	0	0	0	0	0	0	1	1	0	100
	561	25	75	0	0	0	0	0	0	0	0	0	0	0	100
	562	65	34	0	0	0	0	0	0	0	0	1	0	0	100
	563	47	6	0	7	0	33	0	0	0	7	0	0	0	100
	564	45	48	0	0	0	1	0	0	0	4	2	0	0	100
	Mean	46.00	42.40	.00	1.60	.00	6.80	.00	.00	.00	2.20	.80	.20	.00	100.00
	StDev	14.21	25.17	.00	3.05	.00	14.65	.00	.00	.00	3.19	.84	.45	.00	.00
Endocladia	555	26	0	0	33	0	35	0	0	0	6	0	0	0	100
	556	75	2	0	19	0	0	0	0	0	3	1	0	0	100
	557	35	0	0	25	0	30	0	5	0	4	1	0	0	100
	558	20	56	1	12	0	0	0	0	0	5	6	0	0	100
	559	61	11	0	0	0	0	0	1	0	23	4	0	0	100
	Mean	43.40	13.80	.20	17.80	.00	13.00	.00	1.20	.00	8.20	2.40	.00	.00	100.00
	StDev	23.61	24.02	.45	12.60	.00	17.89	.00	2.17	.00	8.35	2.51	.00	.00	.00
Silvetia (Rockweed)	565	6	0	0	0	0	94	0	0	0	0	0	0	0	100
	566	10	0	0	0	0	90	0	0	0	0	0	0	0	100
	567	9	0	0	0	0	80	0	0	0	6	5	0	0	100
	568	17	0	0	17	0	65	0	0	0	1	0	0	0	100
	569	74	0	0	4	0	17	0	0	0	5	0	0	0	100
	Mean	23.20	.00	.00	4.20	.00	69.20	.00	.00	.00	2.40	1.00	.00	.00	100.00
	StDev	28.68	.00	.00	7.36	.00	31.25	.00	.00	.00	2.88	2.24	.00	.00	.00
Mussels	550	25	0	0	0	0	0	46	4	8	8	9	0	0	100
	551	15	0	0	0	0	0	74	0	0	11	0	0	0	100
	552	22	0	0	0	0	0	57	0	10	9	2	0	0	100
	553	33	0	3	0	0	0	32	1	12	16	3	0	0	100
	554	22	0	2	0	0	0	50	0	11	10	5	0	0	100
	Mean	23.40	.00	1.00	.00	.00	.00	51.80	1.00	8.20	10.80	3.80	.00	.00	100.00
	StDev	6.50	.00	1.41	.00	.00	.00	15.40	1.73	4.82	3.11	3.42	.00	.00	.00

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**Table B16. Percent Cover of Index Species
Cat Rock, Anacapa Island - Fall 2004 (1/24/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-18	Chthamalus/Balanus	31	33	20	0	20	25	0	0	0	2	0	0	0	100
		32	46	16	0	20	17	0	0	0	1	0	0	0	100
		33	10	5	0	5	80	0	0	0	0	0	0	0	100
		35	26	33	0	5	36	0	0	0	0	0	0	0	100
		36	15	13	0	2	65	4	0	0	1	0	0	0	100
		37	6	1	0	2	66	18	0	0	7	0	0	0	100
		38	49	43	0	8	0	0	0	0	0	0	0	0	100
		39	57	30	0	3	10	0	0	0	0	0	0	0	100
		135	41	29	0	8	14	3	0	0	5	0	0	0	100
	Mean	31.44	21.11	.00	8.11	34.78	2.78	.00	.00	.00	1.78	.00	.00	.00	100.00
	StDev	18.28	13.78	.00	7.10	28.73	5.91	.00	.00	.00	2.54	.00	.00	.00	.00
	Endocladia	13	5	20	5	56	0	3	5	0	6	0	0	0	100
		14	27	30	11	20	0	0	9	0	3	0	0	0	100
		19	21	3	0	48	12	15	0	0	1	0	0	0	100
		51	19	14	5	5	7	0	1	20	29	0	0	0	100
		52	3	29	4	23	4	0	8	20	9	0	0	0	100
		54	10	17	5	26	3	0	3	21	13	0	0	2	100
		212	13	11	1	63	0	0	4	0	7	0	0	1	100
		467	13	27	4	41	1	0	8	1	5	0	0	0	100
		492	20	11	4	39	3	12	1	0	10	0	0	0	100
	Mean	14.56	18.00	4.33	35.67	3.33	3.33	4.33	6.89	.00	9.22	.00	.00	.33	100.00
	StDev	7.88	9.29	3.08	18.68	4.00	5.89	3.39	10.09	.00	8.26	.00	.00	.71	.00
	Silvetia (Rockweed)	2	18	2	0	33	10	36	0	0	1	0	0	0	100
		3	26	14	0	3	14	38	0	0	5	0	0	0	100
		4	14	2	0	2	7	73	0	0	2	0	0	0	100
		5	11	12	3	36	0	18	4	0	16	0	0	0	100
		6	9	0	0	8	12	70	0	0	1	0	0	0	100
		8	14	0	0	1	6	79	0	0	0	0	0	0	100
		9	0	0	0	5	3	92	0	0	0	0	0	0	100
		10	7	2	0	5	5	74	0	0	7	0	0	0	100
		55	14	30	6	28	5	0	4	0	12	1	0	0	100
	Mean	12.56	6.89	1.00	13.44	6.89	53.33	.89	.00	.00	4.89	.11	.00	.00	100.00
	StDev	7.25	10.15	2.12	14.45	4.43	31.37	1.76	.00	.00	5.75	.33	.00	.00	.00

**Table B16. Percent Cover of Index Species
Cat Rock, Anacapa Island - Fall 2004 (1/24/05) (continued)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Mussels	56	11	15	8	0	0	0	49	0	0	15	2	0	0	100
	164	15	12	9	2	0	0	54	0	1	7	0	0	0	100
	203	12	13	10	0	0	0	52	1	1	10	1	0	0	100
	204	6	2	9	0	0	0	79	0	1	3	0	0	0	100
	468	9	11	7	0	0	0	32	0	0	38	3	0	0	100
	470	31	19	10	6	0	0	21	0	0	9	4	0	0	100
	471	10	20	9	8	0	0	18	0	0	35	0	0	0	100
	472	8	5	10	0	0	0	73	0	2	2	0	0	0	100
	473	18	8	10	6	0	0	36	0	0	21	1	0	0	100
	Mean	13.33	11.67	9.11	2.44	.00	.00	46.00	.11	.56	15.56	1.22	.00	.00	100.00
	StDev	7.55	6.00	1.05	3.28	.00	.00	21.31	.33	.73	13.23	1.48	.00	.00	.00

**Table B17. Percent Cover of Index Species
Middle-East, Anacapa Island - Fall 2004 (1/6/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	243	44	27	12	1	0	0	4	0	0	12	0	0	0	100
	244	62	12	2	17	0	0	0	0	0	7	0	0	0	100
	245	56	11	9	16	0	0	3	0	0	5	0	0	0	100
	Mean	54.00	16.67	7.67	11.33	.00	.00	2.33	.00	.00	8.00	.00	.00	.00	100.00
	StDev	9.17	8.96	5.13	8.96	.00	.00	2.08	.00	.00	3.61	.00	.00	.00	.00
Endocladia	240	23	5	2	29	18	20	0	0	0	3	0	0	0	100
	241	29	23	16	6	0	0	15	0	0	9	0	0	2	100
	242	60	5	1	18	8	0	0	0	0	7	0	0	1	100
	Mean	37.33	11.00	6.33	17.67	8.67	6.67	5.00	.00	.00	6.33	.00	.00	1.00	100.00
	StDev	19.86	10.39	8.39	11.50	9.02	11.55	8.66	.00	.00	3.06	.00	.00	1.00	.00
Silvetia (Rockweed)	53	7	5	3	2	0	28	31	9	0	13	1	0	1	100
	237	2	0	0	0	0	95	0	0	0	3	0	0	0	100
	469	10	1	2	1	1	73	2	0	0	10	0	0	0	100
	Mean	6.33	2.00	1.67	1.00	.33	65.33	11.00	3.00	.00	8.67	.33	.00	.33	100.00
	StDev	4.04	2.65	1.53	1.00	.58	34.15	17.35	5.20	.00	5.13	.58	.00	.58	.00
Mussels	476	0	0	1	0	0	0	90	0	1	7	0	0	1	100
	477	0	0	0	0	0	0	100	0	0	0	0	0	0	100
	478	0	0	0	0	0	0	100	0	0	0	0	0	0	100
	Mean	.00	.00	.33	.00	.00	.00	96.67	.00	.33	2.33	.00	.00	.33	100.00
	StDev	.00	.00	.58	.00	.00	.00	5.77	.00	.58	4.04	.00	.00	.58	.00

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**Table B18. Percent Cover of Index Species
Middle-West, Anacapa Island - Fall 2004 (1/6/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-21	Chthamalus/Balanus	447	75	15	0	4	0	0	0	0	5	1	0	0	100
		448	28	12	2	20	0	0	8	7	23	0	0	0	100
		449	60	9	0	7	0	0	0	0	24	0	0	0	100
		450	60	3	0	5	8	0	0	0	24	0	0	0	100
		451	44	6	0	27	0	0	2	1	17	3	0	0	100
	Mean	53.40	9.00	.40	12.60	1.60	.00	2.00	1.60	.00	18.60	.80	.00	.00	100.00
	StDev	17.94	4.74	.89	10.31	3.58	.00	3.46	3.05	.00	8.14	1.30	.00	.00	.00
	Endocladia	457	13	0	0	29	0	0	35	0	1	22	0	0	100
		458	36	2	3	15	0	0	21	0	4	15	4	0	100
		459	48	4	0	17	0	0	4	0	0	24	3	0	100
B-21		460	62	9	0	26	0	0	0	0	3	0	0	0	100
		461	77	3	0	14	0	0	0	0	5	1	0	0	100
	Mean	47.20	3.60	.60	20.20	.00	.00	12.00	.00	1.00	13.80	1.60	.00	.00	100.00
	StDev	24.51	3.36	1.34	6.83	.00	.00	15.51	.00	1.73	9.58	1.82	.00	.00	.00
	Silvetia (Rockweed)	452	19	1	2	3	0	66	0	0	9	0	0	0	100
		453	16	1	3	0	2	69	0	0	9	0	0	0	100
		454	12	0	2	13	0	2	0	6	64	1	0	0	100
		455	9	0	0	1	0	68	2	3	15	2	0	0	100
		456	19	0	0	0	0	54	0	0	24	3	0	0	100
	Mean	15.00	.40	1.40	3.40	.40	51.80	.40	1.80	.00	24.20	1.20	.00	.00	100.00
B-21	StDev	4.42	.55	1.34	5.50	.89	28.48	.89	2.68	.00	23.08	1.30	.00	.00	.00
	Mussels	462	13	0	2	1	0	81	0	0	2	1	0	0	100
		463	17	1	2	0	0	60	0	0	19	1	0	0	100
		464	8	0	2	0	0	82	0	1	6	1	0	0	100
		465	3	0	0	0	0	94	0	0	3	0	0	0	100
		466	0	0	0	0	0	100	0	0	0	0	0	0	100
	Mean	8.20	.20	1.20	.20	.00	.00	83.40	.00	.20	6.00	.60	.00	.00	100.00
	StDev	6.98	.45	1.10	.45	.00	.00	15.36	.00	.45	7.58	.55	.00	.00	.00

**Table B19. Percent Cover of Index Species
S Frenchy's Cove, Anacapa Island - Fall 2004 (1/23/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	249	44	38	0	14	3	0	0	0	0	1	0	0	0	100
	250	27	50	0	23	0	0	0	0	0	0	0	0	0	100
	251	36	51	0	12	1	0	0	0	0	0	0	0	0	100
	252	29	53	0	16	0	0	0	0	0	1	0	1	0	100
	253	17	37	0	20	23	0	0	0	0	3	0	0	0	100
	Mean	30.60	45.80	.00	17.00	5.40	.00	.00	.00	.00	1.00	.00	.20	.00	100.00
	StDev	10.11	7.66	.00	4.47	9.91	.00	.00	.00	.00	1.22	.00	.45	.00	.00
Endocladia	154	28	10	0	58	0	1	1	0	0	2	0	0	0	100
	155			No photo available for scoring											
	256	24	1	0	61	2	6	0	0	0	6	0	0	0	100
	257	8	1	0	85	1	2	0	0	0	3	0	0	0	100
	258	9	0	0	45	0	46	0	0	0	0	0	0	0	100
	Mean	13.80	2.40	.00	49.80	.60	11.00	.20	.00	.00	2.20	.00	.00	.00	80.00
	StDev	11.76	4.28	.00	31.36	.89	19.70	.45	.00	.00	2.49	.00	.00	.00	44.72
Silvetia (Rockweed)	259	2	0	0	0	0	88	0	0	0	10	0	0	0	100
	260	6	8	0	5	0	76	1	0	0	4	0	0	0	100
	261	17	3	0	0	0	76	0	0	0	4	0	0	0	100
	262	23	17	0	37	0	17	0	1	0	3	0	0	2	100
	263	88	1	0	1	0	4	0	0	0	6	0	0	0	100
	Mean	27.20	5.80	.00	8.60	.00	52.20	.20	.20	.00	5.40	.00	.00	.40	100.00
	StDev	35.01	6.98	.00	16.01	.00	38.65	.45	.45	.00	2.79	.00	.00	.89	.00
Mussels	201	0	1	0	0	0	0	89	0	0	10	0	0	0	100
	202	4	4	0	0	0	0	87	1	0	4	0	0	0	100
	264	3	2	0	0	0	0	91	1	0	3	0	0	0	100
	265	4	0	0	0	0	0	96	0	0	0	0	0	0	100
	266	2	7	0	0	0	0	82	0	0	9	0	0	0	100
	Mean	2.60	2.80	.00	.00	.00	.00	89.00	.40	.00	5.20	.00	.00	.00	100.00
	StDev	1.67	2.77	.00	.00	.00	.00	5.15	.55	.00	4.21	.00	.00	.00	.00

B-22

**Table B20. Percent Cover of Index Species
Crook Point, San Miguel Island - Fall 2004 (1/23/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-23	Chthamalus/Balanus	137	75	25	0	0	0	0	0	0	0	0	0	0	100
		147	60	39	0	0	0	0	0	0	0	1	0	0	100
		148	37	63	0	0	0	0	0	0	0	0	0	0	100
		149	38	49	0	9	0	3	0	0	0	1	0	0	100
		495	16	69	0	12	0	1	0	0	1	1	0	0	100
	Mean	45.20	49.00	.00	4.20	.00	.00	.80	.00	.00	.20	.60	.00	.00	100.00
	StDev	22.80	17.83	.00	5.85	.00	.00	1.30	.00	.00	.45	.55	.00	.00	.00
	Endocladia	386	38	20	0	27	14	0	0	0	0	1	0	0	100
		387	23	14	2	8	0	0	0	0	53	0	0	0	100
		388	25	21	0	21	23	1	0	0	8	1	0	0	100
B-23		389	11	7	1	37	5	31	0	2	4	1	0	0	100
		390	28	22	0	23	0	16	0	4	7	0	0	0	100
	Mean	25.00	16.80	.60	23.20	8.40	.20	9.60	.00	1.20	14.40	.60	.00	.00	100.00
	StDev	9.72	6.30	.89	10.50	9.96	.45	13.76	.00	1.79	21.80	.55	.00	.00	.00
	Silvetia (Rockweed)	396	17	11	1	30	8	20	0	4	6	0	0	0	100
		397	7	3	0	0	0	86	0	0	4	0	0	0	100
		398	21	31	0	11	0	25	0	2	5	0	0	0	100
		399	32	14	0	0	0	0	9	0	40	3	0	0	100
		400	53	8	0	31	4	2	0	0	2	0	0	0	100
	Mean	26.00	13.40	.20	14.40	2.40	2.00	26.60	1.80	1.20	11.40	.60	.00	.00	100.00
B-23	StDev	17.55	10.64	.45	15.37	3.58	2.12	34.95	4.02	1.79	16.06	1.34	.00	.00	.00
	Mussels	381	19	3	0	0	0	45	0	1	32	0	0	0	100
		382	7	0	0	0	0	74	0	0	19	0	0	0	100
		383	2	0	0	0	0	93	0	0	5	0	0	0	100
		384	3	4	0	0	0	88	0	0	5	0	0	0	100
		385	14	3	0	0	0	74	0	4	5	0	0	0	100
	Mean	9.00	2.00	.00	.00	.00	.00	74.80	.00	1.00	13.20	.00	.00	.00	100.00
	StDev	7.31	1.87	.00	.00	.00	.00	18.67	.00	1.73	12.13	.00	.00	.00	.00

**Table B21. Percent Cover of Index Species
Cuyler Harbor, San Miguel Island - Fall 2004 (1/24/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	416	21	78	0	1	0	0	0	0	0	0	0	0	0	100
	417	20	54	0	26	0	0	0	0	0	0	0	0	0	100
	418	14	72	0	13	0	0	0	0	0	0	1	0	0	100
	419	34	30	0	34	0	1	0	0	0	1	0	0	0	100
	420	34	18	0	47	0	1	0	0	0	0	0	0	0	100
	Mean	24.60	50.40	.00	24.20	.00	.40	.00	.00	.00	.20	.20	.00	.00	100.00
	StDev	8.99	26.02	.00	17.91	.00	.55	.00	.00	.00	.45	.45	.00	.00	.00
Endocladia	411	39	0	2	33	0	0	17	0	0	7	2	0	0	100
	412	11	53	1	14	0	0	19	0	0	2	0	0	0	100
	413	12	2	1	27	0	47	1	0	0	9	1	0	0	100
	414	19	0	0	57	0	0	1	6	0	14	3	0	0	100
	415	19	0	0	62	0	1	0	0	0	18	0	0	0	100
	Mean	20.00	11.00	.80	38.60	.00	9.60	7.60	1.20	.00	10.00	1.20	.00	.00	100.00
	StDev	11.27	23.49	.84	20.35	.00	20.91	9.53	2.68	.00	6.20	1.30	.00	.00	.00
Silvetia (Rockweed)	406	25	1	1	3	0	45	0	0	0	18	7	0	0	100
	407	18	0	0	0	0	66	1	0	0	13	2	0	0	100
	408	10	0	3	3	0	77	0	0	0	7	0	0	0	100
	409	6	0	0	0	0	82	0	0	0	8	4	0	0	100
	410	11	0	5	0	0	79	1	0	0	1	3	0	0	100
	Mean	14.00	.20	1.80	1.20	.00	69.80	.40	.00	.00	9.40	3.20	.00	.00	100.00
	StDev	7.52	.45	2.17	1.64	.00	15.12	.55	.00	.00	6.43	2.59	.00	.00	.00
Mussels	401	5	0	1	0	0	0	77	0	7	0	10	0	0	100
	402	2	0	0	0	0	0	92	2	0	0	4	0	0	100
	403	7	0	0	0	0	0	84	0	2	2	5	0	0	100
	404	19	1	18	0	0	0	36	0	3	6	17	0	0	100
	405	30	0	14	0	0	0	43	2	2	3	6	0	0	100
	Mean	12.60	.20	6.60	.00	.00	.00	66.40	.80	2.80	2.20	8.40	.00	.00	100.00
	StDev	11.67	.45	8.71	.00	.00	.00	25.24	1.10	2.59	2.49	5.32	.00	.00	.00

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**Table B22. Percent Cover of Index Species
Harris Point, San Miguel Island - Fall 2004 (1/22/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-25	Chthamalus/Balanus	440	16	75	0	8	1	0	0	0	0	0	0	0	100
		441	23	76	0	1	0	0	0	0	0	0	0	0	100
		442	5	86	0	9	0	0	0	0	0	0	0	0	100
		443	31	69	0	0	0	0	0	0	0	0	0	0	100
		444	44	52	0	3	0	0	0	0	0	0	0	1	100
		Mean	23.80	71.60	.00	4.20	.20	.00	.00	.00	.00	.00	.00	.20	100.00
		StDev	14.79	12.54	.00	4.09	.45	.00	.00	.00	.00	.00	.00	.45	.00
	Endocladia	431	5	34	1	34	4	0	6	0	12	4	0	0	100
		432	17	34	0	33	14	0	0	0	2	0	0	0	100
		433	17	38	0	35	8	0	0	0	2	0	0	0	100
		434	34	7	0	46	13	0	0	0	0	0	0	0	100
		435	21	0	0	34	33	0	0	0	12	0	0	0	100
		Mean	18.80	22.60	.20	36.40	14.40	.00	1.20	.00	5.60	.80	.00	.00	100.00
		StDev	10.40	17.69	.45	5.41	11.15	.00	2.68	.00	5.90	1.79	.00	.00	.00
	Mussels	426	22	0	4	0	0	62	0	3	7	2	0	0	100
		427	20	8	11	15	5	6	0	0	32	3	0	0	100
		428	42	9	14	9	1	12	0	0	9	4	0	0	100
		429	10	23	7	0	0	52	0	0	8	0	0	0	100
		430	10	3	2	0	0	73	0	0	11	1	0	0	100
		Mean	20.80	8.60	7.60	4.80	1.20	.00	41.00	.00	13.40	2.00	.00	.00	100.00
		StDev	13.08	8.85	4.93	6.91	2.17	.00	30.22	.00	10.50	1.58	.00	.00	.00
	Tetraclita	436	18	12	30	0	0	31	0	0	9	0	0	0	100
		437	8	11	23	0	0	28	2	2	22	4	0	0	100
		438	9	0	4	7	0	0	5	0	75	0	0	0	100
		439	6	0	2	10	1	2	0	0	77	2	0	0	100
		445	37	4	23	2	0	20	3	0	6	5	0	0	100
		Mean	15.60	5.40	16.40	3.80	.20	.00	16.20	2.00	37.80	2.20	.00	.00	100.00
		StDev	12.82	5.81	12.58	4.49	.45	.00	14.46	2.12	35.39	2.28	.00	.00	.00
	Hesperophycus	421	21	4	1	10	63	0	0	0	1	0	0	0	100
		422	26	3	0	39	18	0	0	0	13	1	0	0	100
		423	21	2	0	51	16	0	0	0	10	0	0	0	100
		424	11	8	0	17	63	0	0	0	0	0	1	0	100
		425	40	0	0	12	47	0	0	0	1	0	0	0	100
		Mean	23.80	3.40	.20	25.80	41.40	.00	.00	.00	5.00	.20	.20	.00	100.00
		StDev	10.57	2.97	.45	18.21	23.22	.00	.00	.00	6.04	.45	.45	.00	.00

**Table B23. Percent Cover of Index Species
Otter Harbor, San Miguel Island - Fall 2004 (1/21/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	370	72	15	0	0	0	0	0	0	0	13	0	0	0	100
	371	12	65	0	0	0	0	0	0	0	16	0	7	0	100
	372	48	52	0	0	0	0	0	0	0	0	0	0	0	100
	373	14	49	0	1	0	0	0	0	0	32	0	4	0	100
	374	18	0	0	0	0	0	0	27	0	55	0	0	0	100
	Mean	32.80	36.20	.00	.20	.00	.00	.00	5.40	.00	23.20	.00	2.20	.00	100.00
	StDev	26.33	27.40	.00	.45	.00	.00	.00	12.07	.00	21.11	.00	3.19	.00	.00
Endocladia	360	14	20	2	15	0	18	3	0	0	28	0	0	0	100
	361	66	1	0	25	0	1	1	0	0	5	1	0	0	100
	362	8	0	0	84	0	0	1	0	0	7	0	0	0	100
	363	24	0	0	41	0	0	0	0	0	34	1	0	0	100
	364	4	0	0	62	0	17	1	0	0	16	0	0	0	100
	Mean	23.20	4.20	.40	45.40	.00	7.20	1.20	.00	.00	18.00	.40	.00	.00	100.00
	StDev	25.08	8.84	.89	27.95	.00	9.42	1.10	.00	.00	12.75	.55	.00	.00	.00
Silvetia (Rockweed)	355	42	8	2	14	0	1	0	0	0	27	3	3	0	100
	356	25	1	2	15	0	43	0	0	0	14	0	0	0	100
	357	25	0	2	29	0	5	0	0	0	37	2	0	0	100
	358	33	32	0	16	0	5	0	0	0	12	2	0	0	100
	359	14	52	0	10	0	0	0	0	0	22	0	2	0	100
	Mean	27.80	18.60	1.20	16.80	.00	10.80	.00	.00	.00	22.40	1.40	1.00	.00	100.00
	StDev	10.43	22.71	1.10	7.19	.00	18.14	.00	.00	.00	10.16	1.34	1.41	.00	.00
Mussels	375	3	0	2	0	0	0	49	0	9	32	5	0	0	100
	376	21	1	0	0	0	0	56	0	0	21	1	0	0	100
	378	12	0	2	0	0	0	57	1	5	23	0	0	0	100
	379	14	0	1	0	0	0	56	0	6	22	1	0	0	100
	380	7	0	1	0	0	0	54	0	4	33	1	0	0	100
	Mean	11.40	.20	1.20	.00	.00	.00	54.40	.20	4.80	26.20	1.60	.00	.00	100.00
	StDev	6.88	.45	.84	.00	.00	.00	3.21	.45	3.27	5.81	1.95	.00	.00	.00

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**Table B24. Percent Cover of Index Species
Landing Cove, Santa Barbara Island - Fall 2004 (11/10/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Phyllo-spadi-	Total
Chthamalus/Balanus	315	70	13	7	3	0	0	1	0	0	5	1	0	0	100
	316	28	8	2	7	0	0	0	13	0	41	1	0	0	100
	317	44	3	10	3	0	0	7	10	0	23	0	0	0	100
	318	15	2	27	0	0	0	34	1	0	20	1	0	0	100
	319	31	10	7	1	0	0	0	0	0	51	0	0	0	100
	Mean	37.60	7.20	10.60	2.80	.00	.00	8.40	4.80	.00	28.00	.60	.00	.00	100.00
	StDev	20.84	4.66	9.61	2.68	.00	.00	14.60	6.22	.00	18.14	.55	.00	.00	.00
Silvetia (Rockweed)	310	15	3	1	0	0	2	6	8	0	65	0	0	0	100
	311	17	5	0	0	0	1	3	9	0	65	0	0	0	100
	312	21	1	0	0	0	1	2	17	0	57	1	0	0	100
	313	15	2	0	0	0	0	0	31	0	52	0	0	0	100
	314	36	4	0	0	0	6	0	11	0	43	0	0	0	100
	Mean	20.80	3.00	.20	.00	.00	2.00	2.20	15.20	.00	56.40	.20	.00	.00	100.00
	StDev	8.84	1.58	.45	.00	.00	2.35	2.49	9.50	.00	9.32	.45	.00	.00	.00
Mussels	325	3	0	2	0	0	0	88	0	2	4	1	0	0	100
	326	2	0	3	0	0	0	8	0	1	80	6	0	0	100
	327	0	0	0	0	0	0	99	0	1	0	0	0	0	100
	328	0	0	3	0	0	0	51	0	0	43	3	0	0	100
	329	15	0	12	0	0	0	1	3	0	65	4	0	0	100
	Mean	4.00	.00	4.00	.00	.00	.00	49.40	.60	.80	38.40	2.80	.00	.00	100.00
	StDev	6.28	.00	4.64	.00	.00	.00	44.75	1.34	.84	35.77	2.39	.00	.00	.00
Red Algal Turf/	320	1	0	0	0	0	0	0	89	0	10	0	0	0	100
	321	0	0	0	0	0	0	9	56	0	33	2	0	0	100
	322	0	0	0	0	0	0	0	8	0	0	0	0	92	100
	323	0	0	0	0	0	0	0	24	0	16	0	0	60	100
	324	0	0	0	0	0	0	0	68	0	32	0	0	0	100
	Mean	.20	.00	.00	.00	.00	.00	1.80	49.00	.00	18.20	.40	.00	30.40	100.00
	StDev	.45	.00	.00	.00	.00	.00	4.02	32.85	.00	14.25	.89	.00	43.14	.00

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**Table B25. Percent Cover of Index Species
Sea Lion Rookery, Santa Barbara Island - Fall 2004 (11/11/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-28	Chthamalus/Balanus	345	43	7	1	4	0	0	4	2	1	38	0	0	100
		346	56	4	0	0	0	0	0	0	0	40	0	0	100
		347	35	10	0	0	0	0	0	0	0	55	0	0	100
		348	18	4	3	3	0	0	0	0	0	72	0	0	100
		349	44	10	2	0	0	0	0	0	0	44	0	0	100
	Mean	39.20	7.00	1.20	1.40	.00	.00	.80	.40	.20	49.80	.00	.00	.00	100.00
	StDev	14.02	3.00	1.30	1.95	.00	.00	1.79	.89	.45	14.04	.00	.00	.00	.00
	Endocladia	335	44	0	10	0	0	0	1	2	43	0	0	0	100
		336	32	0	2	2	0	0	1	0	63	0	0	0	100
		337	11	0	1	5	0	0	11	1	69	1	0	0	100
B-28		338	27	2	7	16	0	0	2	0	46	0	0	0	100
		339	24	1	15	22	0	0	0	0	38	0	0	0	100
	Mean	27.60	.60	7.00	9.00	.00	.00	2.60	.60	.60	51.80	.20	.00	.00	100.00
	StDev	12.01	.89	5.79	9.54	.00	.00	4.77	.55	.89	13.44	.45	.00	.00	.00
	Silvetia (Rockweed)	330	37	0	15	0	0	48	0	0	0	0	0	0	100
		331	14	0	2	6	0	60	1	3	13	0	0	0	100
		332	15	0	0	0	0	52	1	9	23	0	0	0	100
		333	10	0	1	1	0	32	5	22	27	2	0	0	100
		334	12	0	0	1	0	71	0	2	13	0	0	0	100
	Mean	17.60	.00	3.60	1.60	.00	43.00	11.00	6.80	.80	15.20	.40	.00	.00	100.00
	StDev	11.01	.00	6.43	2.51	.00	27.95	20.77	9.20	1.30	10.50	.89	.00	.00	.00
B-28	Mussels	350	0	0	0	0	0	100	0	0	0	0	0	0	100
		351	0	0	0	0	0	100	0	0	0	0	0	0	100
		352	0	0	1	0	0	99	0	0	0	0	0	0	100
		353	0	0	0	0	0	100	0	0	0	0	0	0	100
		354	0	0	0	0	0	91	0	9	0	0	0	0	100
	Mean	.00	.00	.20	.00	.00	.00	98.00	.00	1.80	.00	.00	.00	.00	100.00
	StDev	.00	.00	.45	.00	.00	.00	3.94	.00	4.02	.00	.00	.00	.00	.00

**Table B26. Percent Cover of Index Species
Fraser Cove, Santa Cruz Island - Fall 2004 (11/12/04)**

		Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total	
B-29	Chthamalus/Balanus	876	18	39	0	9	0	0	2	0	0	30	0	1	1	100
		877	43	19	0	14	0	0	2	0	0	22	0	0	0	100
		878	29	63	0	5	0	0	0	0	0	0	0	3	0	100
		879	16	59	0	18	0	0	0	0	0	5	0	2	0	100
		880	47	20	0	3	0	0	0	0	0	30	0	0	0	100
		Mean	30.60	40.00	.00	9.80	.00	.00	.80	.00	.00	17.40	.00	1.20	.20	100.00
		StDev	14.12	20.81	.00	6.22	.00	.00	1.10	.00	.00	14.10	.00	1.30	.45	.00
	Endocladia	881	20	15	0	37	0	0	8	0	0	20	0	0	0	100
		882	8	16	0	38	0	0	2	0	0	36	0	0	0	100
		883	14	7	0	62	10	0	0	0	0	7	0	0	0	100
		884	19	4	0	68	0	0	0	0	0	9	0	0	0	100
		885	12	0	0	80	0	0	0	0	0	7	0	0	1	100
		Mean	14.60	8.40	.00	57.00	2.00	.00	2.00	.00	.00	15.80	.00	.00	.20	100.00
		StDev	4.98	6.95	.00	18.95	4.47	.00	3.46	.00	.00	12.52	.00	.00	.45	.00
B-29	Silvetia (Rockweed)	896	14	1	0	18	24	43	0	0	0	0	0	0	0	100
		897	24	0	0	4	2	64	0	0	0	6	0	0	0	100
		898	21	2	0	1	0	74	0	0	0	2	0	0	0	100
		899	11	2	0	4	17	66	0	0	0	0	0	0	0	100
		900	15	4	0	4	4	73	0	0	0	0	0	0	0	100
		Mean	17.00	1.80	.00	6.20	9.40	64.00	.00	.00	.00	1.60	.00	.00	.00	100.00
		StDev	5.34	1.48	.00	6.72	10.53	12.51	.00	.00	.00	2.61	.00	.00	.00	.00
	Mussels	891	3	0	0	0	0	0	83	0	0	2	12	0	0	100
		892	20	3	0	0	0	0	71	0	0	3	3	0	0	100
		893	5	0	0	1	0	0	78	0	0	1	13	0	2	100
		894	13	0	0	1	0	0	78	0	0	2	6	0	0	100
		895	3	0	0	0	0	0	86	0	2	6	2	0	1	100
		Mean	8.80	.60	.00	.40	.00	.00	79.20	.00	.40	2.80	7.20	.00	.60	100.00
		StDev	7.50	1.34	.00	.55	.00	.00	5.72	.00	.89	1.92	5.07	.00	.89	.00
B-29	Pollicipes	901	13	19	5	1	0	0	49	0	3	7	2	0	1	100
		902	25	7	2	26	0	0	8	2	3	9	14	1	3	100
		903	3	1	0	0	0	0	59	2	13	9	12	0	1	100
		904	6	3	3	0	0	0	67	0	5	14	2	0	0	100
		905	4	2	0	0	0	0	68	3	14	2	5	0	2	100
		Mean	10.20	6.40	2.00	5.40	.00	.00	50.20	1.40	7.60	8.20	7.00	.20	1.40	100.00
		StDev	9.15	7.40	2.12	11.52	.00	.00	24.79	1.34	5.46	4.32	5.66	.45	1.14	.00

**Table B26. Percent Cover of Index Species
Fraser Cove, Santa Cruz Island - Fall 2004 (11/12/04) (continued)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Tar	906	32	25	0	0	0	0	0	0	0	0	0	43	0	100
	907	30	25	0	0	0	0	0	0	0	1	0	44	0	100
	908	30	14	0	0	0	0	0	0	0	0	0	56	0	100
	909	42	13	0	0	0	0	0	0	0	0	0	45	0	100
	910	30	8	0	0	0	0	0	0	0	0	0	62	0	100
	Mean	32.80	17.00	.00	.00	.00	.00	.00	.00	.00	.20	.00	50.00	.00	100.00
	StDev	5.22	7.65	.00	.00	.00	.00	.00	.00	.00	.45	.00	8.51	.00	.00
Hesperophycus	886	46	2	0	17	35	0	0	0	0	0	0	0	0	100
	887	60	3	0	18	10	0	0	0	0	9	0	0	0	100
	888	23	21	0	21	30	3	0	0	2	0	0	0	0	100
	889	35	3	0	10	48	3	0	0	0	1	0	0	0	100
	890	58	10	0	16	16	0	0	0	0	0	0	0	0	100
	Mean	44.40	7.80	.00	16.40	27.80	1.20	.00	.00	.40	2.00	.00	.00	.00	100.00
	StDev	15.63	8.04	.00	4.04	15.17	1.64	.00	.00	.89	3.94	.00	.00	.00	.00

**Table B27. Percent Cover of Index Species
Prisoner's Harbor, Santa Cruz Island - Fall 2004 (11/11/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-31	Chthamalus/Balanus	826	38	2	0	0	0	0	0	0	60	0	0	0	100
		827	45	9	0	0	0	0	0	0	46	0	0	0	100
		828	35	20	0	9	1	0	2	0	33	0	0	0	100
		829	25	50	0	4	1	0	5	1	14	0	0	0	100
		830	26	22	0	4	0	0	0	1	47	0	0	0	100
	Mean	33.80	20.60	.00	3.40	.40	.00	1.40	.40	.00	40.00	.00	.00	.00	100.00
	StDev	8.41	18.35	.00	3.71	.55	.00	2.19	.55	.00	17.39	.00	.00	.00	.00
	Endocladia	831	48	17	1	11	3	5	0	0	15	0	0	0	100
		832	26	27	0	31	10	3	0	0	3	0	0	0	100
		833	27	41	0	28	2	2	0	0	0	0	0	0	100
B-31		834	37	35	0	20	0	5	0	0	2	0	0	1	100
		835	51	8	0	17	14	9	0	0	0	0	0	1	100
	Mean	37.80	25.60	.20	21.40	5.80	.00	4.80	.00	.00	4.00	.00	.00	.40	100.00
	StDev	11.56	13.33	.45	8.14	5.93	.00	2.68	.00	.00	6.28	.00	.00	.55	.00
	Silvetia (Rockweed)	846	58	4	2	0	3	0	0	0	28	5	0	0	100
		847	74	2	3	0	2	6	0	0	11	2	0	0	100
		848	59	0	1	0	0	2	0	0	21	6	0	0	100
		849	23	0	0	0	17	0	0	0	57	3	0	0	100
		850	23	1	1	0	31	0	0	0	41	3	0	0	100
	Mean	47.40	1.40	1.40	.00	.00	12.80	1.60	.00	.00	31.60	3.80	.00	.00	100.00
B-31	StDev	23.16	1.67	1.14	.00	.00	11.88	2.61	.00	.00	17.91	1.64	.00	.00	.00
	Mussels	841	11	5	0	0	0	53	1	0	28	2	0	0	100
		842	2	11	2	0	0	76	1	0	7	1	0	0	100
		843	7	10	4	0	0	53	0	0	25	1	0	0	100
		844	1	2	0	0	0	87	0	0	9	1	0	0	100
		845	2	6	7	0	0	80	0	0	5	0	0	0	100
	Mean	4.60	6.80	2.60	.00	.00	.00	69.80	.40	.00	14.80	1.00	.00	.00	100.00
	StDev	4.28	3.70	2.97	.00	.00	.00	15.83	.55	.00	10.83	.71	.00	.00	.00
	Hesperophycus	836	69	6	0	16	2	0	0	0	3	4	0	0	100
		837	85	5	0	7	2	0	0	0	0	1	0	0	100
B-31		838	82	5	0	5	0	0	0	0	5	3	0	0	100
		839	35	53	0	4	7	1	0	0	0	0	0	0	100
		840	63	23	0	5	5	0	0	0	0	4	0	0	100
	Mean	66.80	18.40	.00	7.40	3.20	.20	.00	.00	.00	1.60	2.40	.00	.00	100.00
	StDev	19.95	20.80	.00	4.93	2.77	.45	.00	.00	.00	2.30	1.82	.00	.00	.00

**Table B28. Percent Cover of Index Species
Scorpion Rock, Santa Cruz Island - Fall 2004 (1/8/05)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-32	Chthamalus/Balanus	801	28	38	0	33	0	0	0	0	1	0	0	0	100
		802	26	41	0	33	0	0	0	0	0	0	0	0	100
		803	46	12	0	42	0	0	0	0	0	0	0	0	100
		804	23	25	0	51	0	0	0	0	1	0	0	0	100
		805	46	54	0	0	0	0	0	0	0	0	0	0	100
		Mean	33.80	34.00	.00	31.80	.00	.00	.00	.00	.40	.00	.00	.00	100.00
		StDev	11.28	16.05	.00	19.28	.00	.00	.00	.00	.55	.00	.00	.00	.00
	Endocladia	806	4	4	1	71	0	2	0	0	18	0	0	0	100
		807	2	1	0	67	0	2	0	0	28	0	0	0	100
		808	13	2	0	56	0	7	1	2	18	1	0	0	100
		809	29	16	0	49	0	1	0	2	3	0	0	0	100
		810	38	11	0	31	0	0	0	2	18	0	0	0	100
		Mean	17.20	6.80	.20	54.80	.00	2.40	.20	1.20	17.00	.20	.00	.00	100.00
		StDev	15.77	6.46	.45	15.91	.00	2.70	.45	1.10	8.94	.45	.00	.00	.00
	Mussels	816	11	6	26	0	0	19	0	4	27	7	0	0	100
		817	14	1	7	0	0	5	0	0	71	2	0	0	100
		818	7	1	27	0	0	14	2	4	44	1	0	0	100
		819	13	24	29	0	0	5	1	3	24	1	0	0	100
		820	12	1	29	0	0	8	7	0	41	2	0	0	100
		Mean	11.40	6.60	23.60	.00	.00	10.20	2.00	2.20	41.40	2.60	.00	.00	100.00
		StDev	2.70	9.96	9.37	.00	.00	6.14	2.92	2.05	18.66	2.51	.00	.00	.00
	Tetraclita	821	27	23	9	0	0	30	0	5	5	1	0	0	100
		822	30	20	3	9	0	19	0	4	10	5	0	0	100
		823	38	34	8	0	0	2	0	0	14	4	0	0	100
		824	32	52	7	0	0	2	0	0	5	2	0	0	100
		825	16	66	8	1	0	5	0	0	4	0	0	0	100
		Mean	28.60	39.00	7.00	2.00	.00	11.60	.00	1.80	7.60	2.40	.00	.00	100.00
		StDev	8.11	19.62	2.35	3.94	.00	12.46	.00	2.49	4.28	2.07	.00	.00	.00
	Hesperophycus	811	29	2	0	13	53	0	0	1	1	1	0	0	100
		812	35	0	0	21	32	3	0	0	6	0	0	0	100
		813	11	0	0	16	41	25	0	0	6	1	0	0	100
		814	63	0	0	17	8	6	0	0	6	0	0	0	100
		815	13	0	0	17	43	13	0	0	13	1	0	0	100
		Mean	30.20	.40	.00	16.80	35.40	9.40	.60	.20	6.40	.60	.00	.00	100.00
		StDev	21.00	.89	.00	2.86	17.04	9.96	1.34	.00	4.28	.55	.00	.00	.00

**Table B29. Percent Cover of Index Species
Trailer, Santa Cruz Island - Fall 2004 (11/13/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	911	50	50	0	0	0	0	0	0	0	0	0	0	0	100
	912	58	42	0	0	0	0	0	0	0	0	0	0	0	100
	913	29	54	0	14	0	0	0	0	0	2	1	0	0	100
	914	23	75	0	0	0	0	0	0	0	0	2	0	0	100
	915	50	48	0	0	0	0	0	0	0	0	2	0	0	100
	Mean	42.00	53.80	.00	2.80	.00	.00	.00	.00	.00	.40	1.00	.00	.00	100.00
	StDev	15.12	12.62	.00	6.26	.00	.00	.00	.00	.00	.89	1.00	.00	.00	.00
Silvetia (Rockweed)	926	6	0	0	0	0	92	0	0	0	1	0	0	1	100
	927	28	0	0	0	0	69	0	0	0	3	0	0	0	100
	928	15	2	0	4	0	75	0	0	0	3	0	0	1	100
	929	2	0	0	0	0	97	0	0	0	1	0	0	0	100
	930	1	0	0	0	0	99	0	0	0	0	0	0	0	100
	Mean	10.40	.40	.00	.80	.00	86.40	.00	.00	.00	1.60	.00	.00	.40	100.00
	StDev	11.28	.89	.00	1.79	.00	13.56	.00	.00	.00	1.34	.00	.00	.55	.00
Mussels	921	21	8	0	0	0	0	0	6	0	59	6	0	0	100
	922	7	1	0	0	0	0	66	0	0	21	4	0	1	100
	923	5	2	0	0	0	0	84	0	0	7	0	0	2	100
	924	8	8	0	1	0	0	76	0	0	5	2	0	0	100
	925	14	4	1	0	0	0	76	1	0	1	1	0	2	100
	Mean	11.00	4.60	.20	.20	.00	.00	60.40	1.40	.00	18.60	2.60	.00	1.00	100.00
	StDev	6.52	3.29	.45	.45	.00	.00	34.36	2.61	.00	23.81	2.41	.00	1.00	.00
Hesperophycus	916	43	2	0	15	7	33	0	0	0	0	0	0	0	100
	917	20	1	0	20	2	57	0	0	0	0	0	0	0	100
	918	20	0	0	16	8	56	0	0	0	0	0	0	0	100
	919	87	5	0	5	0	3	0	0	0	0	0	0	0	100
	920	37	11	0	20	21	6	0	1	0	4	0	0	0	100
	Mean	41.40	3.80	.00	15.20	7.60	31.00	.00	.20	.00	.80	.00	.00	.00	100.00
	StDev	27.46	4.44	.00	6.14	8.20	26.05	.00	.45	.00	1.79	.00	.00	.00	.00

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**Table B30. Percent Cover of Index Species
Willows Anchorage, Santa Cruz Island - Fall 2004 (11/14/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Endocladia	931	26	6	0	65	0	0	0	0	0	2	1	0	0	100
	932	33	0	0	67	0	0	0	0	0	0	0	0	0	100
	933	38	5	0	52	0	0	0	0	0	5	0	0	0	100
	934	17	3	0	46	0	0	1	0	0	33	0	0	0	100
	935	24	8	1	33	0	0	1	0	0	33	0	0	0	100
	Mean	27.60	4.40	.20	52.60	.00	.00	.40	.00	.00	14.60	.20	.00	.00	100.00
	StDev	8.14	3.05	.45	14.05	.00	.00	.55	.00	.00	16.89	.45	.00	.00	.00
Silvetia (Rockweed)	946	35	2	0	33	0	0	0	1	0	29	0	0	0	100
	947	28	5	0	31	0	0	0	0	0	36	0	0	0	100
	948	3	2	0	2	0	88	0	0	0	5	0	0	0	100
	949	0	0	0	0	0	100	0	0	0	0	0	0	0	100
	950	29	17	0	16	0	3	0	0	0	35	0	0	0	100
	Mean	19.00	5.20	.00	16.40	.00	38.20	.00	.20	.00	21.00	.00	.00	.00	100.00
	StDev	16.23	6.83	.00	15.53	.00	51.13	.00	.45	.00	17.19	.00	.00	.00	.00
Mussels	941	No photo available for scoring													
	942	4	0	0	0	0	0	94	0	1	1	0	0	0	100
	943	1	0	0	0	0	0	98	0	0	0	1	0	0	100
	944	0	0	0	0	0	0	100	0	0	0	0	0	0	100
	945	0	0	0	0	0	0	99	0	1	0	0	0	0	100
	Mean	1.00	.00	.00	.00	.00	.00	78.20	.00	.40	.20	.20	.00	.00	80.00
	StDev	1.73	.00	.00	.00	.00	.00	43.77	.00	.55	.45	.45	.00	.00	44.72
Hesperophycus	936	28	1	0	70	0	0	0	0	0	1	0	0	0	100
	937	69	15	0	0	0	8	0	0	0	8	0	0	0	100
	938	68	10	0	2	0	0	0	0	0	20	0	0	0	100
	939	16	0	0	0	0	80	0	0	0	4	0	0	0	100
	940	18	0	0	3	17	49	0	0	0	13	0	0	0	100
	Mean	39.80	5.20	.00	15.00	3.40	27.40	.00	.00	.00	9.20	.00	.00	.00	100.00
	StDev	26.59	6.91	.00	30.77	7.60	35.75	.00	.00	.00	7.53	.00	.00	.00	.00

**Table B31. Percent Cover of Index Species
East Point, Santa Rosa Island - Fall 2004 (12/9/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
B-35	Chthamalus/Balanus	575	81	18	0	0	0	0	0	0	1	0	0	0	100
		576	50	3	0	7	30	1	0	0	8	1	0	0	100
		577	32	25	0	31	6	1	0	0	4	1	0	0	100
		578	80	19	0	0	0	0	0	0	0	0	1	0	100
		579	69	26	0	4	0	0	0	0	0	0	1	0	100
	Mean	62.40	18.20	.00	8.40	7.20	.40	.00	.00	.00	2.60	.40	.40	.00	100.00
	StDev	21.08	9.20	.00	12.97	13.01	.55	.00	.00	.00	3.44	.55	.55	.00	.00
	Endocladia	580	51	0	0	21	15	10	0	0	3	0	0	0	100
		581	20	2	0	34	34	2	0	0	8	0	0	0	100
		582	18	1	0	56	14	4	0	0	7	0	0	0	100
B-35		583	28	2	0	63	6	0	0	0	1	0	0	0	100
		584	32	3	0	60	4	0	0	0	1	0	0	0	100
	Mean	29.80	1.60	.00	46.80	14.60	3.20	.00	.00	.00	4.00	.00	.00	.00	100.00
	StDev	13.16	1.14	.00	18.38	11.87	4.15	.00	.00	.00	3.32	.00	.00	.00	.00
	Silvetia (Rockweed)	585	16	0	0	5	0	62	0	0	17	0	0	0	100
		586	21	0	0	4	66	1	1	0	7	0	0	0	100
		587	48	0	0	1	15	0	0	0	34	2	0	0	100
		588	5	0	0	1	86	0	0	0	8	0	0	0	100
		589	4	0	0	0	79	0	0	0	15	2	0	0	100
	Mean	18.80	.00	.00	1.20	1.00	61.60	.20	.20	.00	16.20	.80	.00	.00	100.00
B-35	StDev	17.85	.00	.00	2.17	1.73	27.79	.45	.45	.00	10.85	1.10	.00	.00	.00
	Mussels	590	1	0	0	0	0	64	4	2	27	2	0	0	100
		591	5	0	0	0	0	29	12	0	51	3	0	0	100
		592	2	0	0	0	0	80	2	0	15	1	0	0	100
		593	1	0	0	0	0	93	0	0	5	1	0	0	100
		594	3	0	0	0	0	87	0	0	9	1	0	0	100
	Mean	2.40	.00	.00	.00	.00	.00	70.60	3.60	.40	21.40	1.60	.00	.00	100.00
	StDev	1.67	.00	.00	.00	.00	.00	25.66	4.98	.89	18.51	.89	.00	.00	.00
	Hesperophycus	570	51	3	0	35	7	0	0	0	3	1	0	0	100
		571	66	6	0	13	11	0	0	0	2	2	0	0	100
B-35		572	68	16	0	5	6	2	0	0	1	2	0	0	100
		573	68	10	0	5	7	7	0	0	0	2	1	0	100
		574	43	25	0	22	2	4	0	0	2	1	1	0	100
	Mean	59.20	12.00	.00	16.00	6.60	2.60	.00	.00	.00	1.60	1.60	.40	.00	100.00
	StDev	11.52	8.75	.00	12.73	3.21	2.97	.00	.00	.00	1.14	.55	.55	.00	.00

**Table B32. Percent Cover of Index Species
Ford Point, Santa Rosa Island - Fall 2004 (12/14/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	520	72	23	0	0	0	0	0	0	0	0	5	0	0	100
	521	62	34	0	0	0	0	1	0	0	0	3	0	0	100
	522	69	27	0	0	0	0	0	0	0	0	4	0	0	100
	523	41	24	0	32	0	0	0	0	0	0	3	0	0	100
	524	65	34	0	0	0	0	0	0	0	1	0	0	0	100
	Mean	61.80	28.40	.00	6.40	.00	.00	.20	.00	.00	.20	3.00	.00	.00	100.00
	StDev	12.24	5.32	.00	14.31	.00	.00	.45	.00	.00	.45	1.87	.00	.00	.00
Endocladia	525	21	1	0	44	0	0	6	1	0	26	1	0	0	100
	526	52	6	0	28	0	0	6	0	0	7	1	0	0	100
	527	17	0	0	41	0	0	3	1	0	36	2	0	0	100
	528	23	2	0	43	0	0	0	5	0	23	4	0	0	100
	529	33	1	0	46	0	0	0	0	0	20	0	0	0	100
	Mean	29.20	2.00	.00	40.40	.00	.00	3.00	1.40	.00	22.40	1.60	.00	.00	100.00
	StDev	14.04	2.35	.00	7.16	.00	.00	3.00	2.07	.00	10.50	1.52	.00	.00	.00
Mussels	530	64	8	0	1	0	0	15	2	0	6	4	0	0	100
	531	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	532	26	0	0	0	0	0	15	0	0	44	15	0	0	100
	533	38	2	0	10	0	0	21	3	1	24	1	0	0	100
	534	26	0	0	0	0	0	0	41	0	29	4	0	0	100
	Mean	30.80	2.00	.00	2.20	.00	.00	10.20	9.20	.20	20.60	4.80	.00	.00	80.00
	StDev	23.18	3.46	.00	4.38	.00	.00	9.63	17.82	.45	17.80	5.97	.00	.00	44.72

**Table B33. Percent Cover of Index Species
Fossil Reef, Santa Rosa Island - Fall 2004 (12/12/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	605	65	32	0	2	0	0	0	0	0	1	0	0	0	100
	606	62	27	0	0	0	0	0	0	0	2	0	9	0	100
	607	76	21	0	0	0	0	0	0	0	0	3	0	0	100
	608	81	18	0	0	0	0	0	0	0	1	0	0	0	100
	609	73	22	0	0	0	0	0	0	0	4	0	1	0	100
	Mean	71.40	24.00	.00	.40	.00	.00	.00	.00	.00	1.60	.60	2.00	.00	100.00
	StDev	7.83	5.52	.00	.89	.00	.00	.00	.00	.00	1.52	1.34	3.94	.00	.00
Endocladia	610	38	27	0	33	0	0	0	0	0	2	0	0	0	100
	611	43	49	0	7	0	0	0	0	0	0	1	0	0	100
	612	84	10	0	0	0	0	0	0	0	1	5	0	0	100
	613	25	3	0	51	0	19	0	0	0	2	0	0	0	100
	614	59	4	0	3	0	30	0	0	0	3	1	0	0	100
	Mean	49.80	18.60	.00	18.80	.00	9.80	.00	.00	.00	1.60	1.40	.00	.00	100.00
	StDev	22.66	19.53	.00	22.25	.00	13.97	.00	.00	.00	1.14	2.07	.00	.00	.00
Silvetia (Rockweed)	615	80	14	0	4	0	0	0	0	0	0	2	0	0	100
	616	63	9	0	13	0	1	0	0	0	13	1	0	0	100
	617	53	2	0	10	0	34	0	0	0	1	0	0	0	100
	618	27	0	0	9	0	58	0	0	0	5	1	0	0	100
	619	15	2	0	7	0	76	0	0	0	0	0	0	0	100
	Mean	47.60	5.40	.00	8.60	.00	33.80	.00	.00	.00	3.80	.80	.00	.00	100.00
	StDev	26.47	5.90	.00	3.36	.00	33.86	.00	.00	.00	5.54	.84	.00	.00	.00
Mussels	620	10	0	2	0	0	0	7	14	0	46	21	0	0	100
	621	22	6	6	0	0	0	10	0	0	44	12	0	0	100
	622	22	3	12	0	0	0	53	1	1	7	1	0	0	100
	623	29	3	4	0	0	0	40	0	7	13	4	0	0	100
	624	1	0	2	0	0	0	0	45	0	29	23	0	0	100
	Mean	16.80	2.40	5.20	.00	.00	.00	22.00	12.00	1.60	27.80	12.20	.00	.00	100.00
	StDev	11.17	2.51	4.15	.00	.00	.00	23.12	19.38	3.05	17.66	9.83	.00	.00	.00

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**Table B34. Percent Cover of Index Species
Johnson's Lee, Santa Rosa Island - Fall 2004 (12/11/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	500	56	44	0	0	0	0	0	0	0	0	0	0	0	100
	501	35	62	0	0	0	0	0	0	0	0	3	0	0	100
	502	65	31	0	0	0	0	0	0	0	0	4	0	0	100
	503	30	40	0	28	0	0	0	0	0	0	2	0	0	100
	504	55	3	0	2	0	0	0	0	0	35	5	0	0	100
	Mean	48.20	36.00	.00	6.00	.00	.00	.00	.00	.00	7.00	2.80	.00	.00	100.00
	StDev	14.96	21.62	.00	12.33	.00	.00	.00	.00	.00	15.65	1.92	.00	.00	.00
Endocladia	505	55	5	1	20	0	0	15	0	0	4	0	0	0	100
	506	49	7	0	38	0	0	3	0	0	0	3	0	0	100
	507	42	3	0	37	0	0	14	0	0	2	2	0	0	100
	508	28	15	2	29	0	0	18	0	1	1	6	0	0	100
	509	34	1	1	49	0	0	0	0	0	13	2	0	0	100
	Mean	41.60	6.20	.80	34.60	.00	.00	10.00	.00	.20	4.00	2.60	.00	.00	100.00
	StDev	10.92	5.40	.84	10.83	.00	.00	7.97	.00	.45	5.24	2.19	.00	.00	.00
Mussels	510	1	0	0	0	0	0	0	4	0	1	94	0	0	100
	511	9	0	0	0	0	0	1	1	0	16	73	0	0	100
	512	19	0	0	0	0	0	77	0	1	1	2	0	0	100
	513	4	0	0	0	0	0	0	23	0	15	58	0	0	100
	514	0	0	0	0	0	0	0	18	0	40	42	0	0	100
	Mean	6.60	.00	.00	.00	.00	.00	15.60	9.20	.20	14.60	53.80	.00	.00	100.00
	StDev	7.77	.00	.00	.00	.00	.00	34.33	10.57	.45	15.95	34.73	.00	.00	.00

**Table B35. Percent Cover of Index Species
NW Talcott, Santa Rosa Island - Fall 2004 (12/13/04)**

Zone	Plot	Bare Rock	Acorn Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other	Total
Chthamalus/Balanus	560	57	37	0	4	0	0	0	0	0	0	0	2	0	100
	561	25	73	0	1	0	1	0	0	0	0	0	0	0	100
	562	74	18	0	2	0	0	0	0	0	5	1	0	0	100
	563	36	6	0	7	0	48	0	0	0	3	0	0	0	100
	564	62	14	0	0	0	8	0	0	0	5	11	0	0	100
	Mean	50.80	29.60	.00	2.80	.00	11.40	.00	.00	.00	2.60	2.40	.40	.00	100.00
	StDev	19.92	26.80	.00	2.77	.00	20.73	.00	.00	.00	2.51	4.83	.89	.00	.00
Endocladia	555	9	0	0	24	0	64	0	0	0	3	0	0	0	100
	556	66	2	0	16	0	15	0	0	0	0	1	0	0	100
	557	24	0	0	28	0	33	0	8	0	7	0	0	0	100
	558	42	5	1	14	0	0	2	3	0	31	2	0	0	100
	559	74	0	1	1	0	0	0	2	0	21	1	0	0	100
	Mean	43.00	1.40	.40	16.60	.00	22.40	.40	2.60	.00	12.40	.80	.00	.00	100.00
	StDev	27.42	2.19	.55	10.43	.00	26.93	.89	3.29	.00	13.15	.84	.00	.00	.00
Silvetia (Rockweed)	565	7	0	0	0	0	93	0	0	0	0	0	0	0	100
	566	20	1	0	0	0	73	0	0	0	6	0	0	0	100
	567	12	0	0	0	0	70	0	1	0	11	6	0	0	100
	568	8	0	0	5	0	87	0	0	0	0	0	0	0	100
	569	68	1	0	3	0	19	0	1	0	7	1	0	0	100
	Mean	23.00	.40	.00	1.60	.00	68.40	.00	.40	.00	4.80	1.40	.00	.00	100.00
	StDev	25.67	.55	.00	2.30	.00	29.22	.00	.55	.00	4.76	2.61	.00	.00	.00
Mussels	550	23	0	0	1	0	0	46	4	3	14	9	0	0	100
	551	19	0	0	0	0	0	72	1	0	6	2	0	0	100
	552	19	0	0	0	0	0	64	0	8	7	2	0	0	100
	553	28	0	2	0	0	0	38	3	8	20	1	0	0	100
	554	21	0	2	0	0	0	55	0	6	11	5	0	0	100
	Mean	22.00	.00	.80	.20	.00	.00	55.00	1.60	5.00	11.60	3.80	.00	.00	100.00
	StDev	3.74	.00	1.10	.45	.00	.00	13.60	1.82	3.46	5.68	3.27	.00	.00	.00

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Appendix C. Trip Reports

The following are trip reports from the Rocky Intertidal Monitoring 2004 field season (March 2004 through January 2005). Reports were prepared by Dan Richards and Paula Rich. The reports summarize the work done during each monitoring event, provide a quick summary of the data collected, include many of the data tables and site specific graphs, and serve as metadata for the information collected.

General note about motile invertebrate tables: the totals of *Littorina* spp., limpets <5 mm, and limpets 5-15 mm are extrapolated values for the full 50x75 cm plot calculated from either 10x10 cm or 20x20 cm sub-samples.

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Spring 2004 Rocky Intertidal Monitoring Trip Reports

Santa Cruz Island March 15-16, 2004

(Database event #2004-A)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park

PROCEDURE and general observations: rode out to Scorpion Monday on the *Ocean Ranger* and returned on the *Island Adventure* on Tuesday. I conducted the monthly Beachwalk survey at Smugglers and Yellowbanks beaches according to standard Beachwalk protocol. I kayaked to Scorpion Rock to conduct intertidal monitoring. Photos were taken with an Olympus 5050 digital camera. Motile invertebrate counts were made in each plot. Because of limited time, seastar and abalone searches were not done.

15 March 2004, Smugglers Beach. Low tide -0.6 ft at 1231 hrs, Overcast sky with calm sea and wind. Because of delays getting gear onto the island, I decided to survey the beaches and put off the intertidal monitoring until Tuesday. Everything went well. There was very little of interest on the beaches. Two mummified birds were found at the north end of Smugglers, both were probably common murrelets and at least one had been there for several months. Live birds were not much more abundant, with only four killdeer and two California gulls present. Balloons and plastic bottles were the most common debris items but debris overall was not abundant. Part of a wooden boat hull is exposed on the northern portion of Smugglers.

16 March 2004, Scorpion Rock, Low tide -0.8 ft at 1318 hrs. Good conditions with overcast sky in the morning clearing over the island about mid day and very calm. Three Black Oystercatchers and one American Oystercatcher were observed at Scorpion Rock. On site from 0900-1500 hrs.

Monitoring was a bit rushed with only one person. I began counting motile invertebrates in the plots as soon as I arrived on site. The sun came out by the time I began taking photos which caused difficulties with shading the plots (to reduce contrast in the photos). Motile invertebrates were counted in all plots, but in the rush to finish I missed photographing plot B2. No search was made for abalone. There was not enough time to count or measure seastars as the boat was scheduled to depart at 1500 and I was counting in plots until then. The seastar numbers look about the same as in January with large *Pisaster ochraceus* along the reef edges and in the tidepool beside M2. Several ochre stars were in mussel plot M1. Mussel plot M2 was the only plot with *Mytilus californianus* in abundance. Young *M. californianus* were recruiting into plot M5. With *M. californianus* numbers reduced, I could see *Modiolus capax*, *Diplodontia orbellus*, and *Psuedochama exogyra* in the plots.

Endocladia muricata looked good with relatively high cover. *Balanus glandula* were common, in typical abundance for this area. *Hesperophycus californicus* was healthy but in only moderate abundance. *Silvetia compressa* was only slightly less common. Snails and chitons were not at all common in the *Hesperophycus* zone. In general *Littorina* spp. were abundant throughout most zones. *Ocenebra circumtexta* were common in all but the barnacle and *Hesperophycus* zones. One mussel plot had 30 *O. circumtexta*.

**Photoplot summary – mean percent cover by zone at Scorpion Rock, Santa Cruz Island,
spring 2004 (5 plots/zone)**

Zone	Bare Rock	Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc Algae	Misc Animal	Other
Barnacle	36.4	17.2	0.0	25.8	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.4
Endocladia	28.4	4.0	0.4	53.8	0.0	0.2	1.4	0.0	1.4	10.0	0.2	0.2
Mussels	24.2	10.4	16.4	2.6	0.0	0.0	29.4	1.0	0.2	12.8	1.8	1.2
Tetraclita	55.4	3.6	11.4	3.8	0.0	0.0	13.4	0.0	3.0	7.2	1.6	0.6
Hespero- phycus	40.4	0.4	0.0	23.8	20.8	11.0	0.8	0.0	0.2	2.6	0.0	0.0

**Motile invertebrate counts and size frequency measurements for Scorpion Rock, Santa
Cruz Island, spring 2004**

	<i>Nucella emarginata</i>	<i>Acanthina spp.</i>	<i>Tegula funnebralis</i>	<i>Ceratostoma nuttali</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
count	8	19	4	1	84	8
avg size (mm)	17	16	17	29	12	41
min size (mm)	11	7	15	29	4	12
max size (mm)	22	22	19	29	36	63

zone	Barnacle					Endocladia					Hesperophycus				
plot #	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815
Lepidochitona spp.							2	1				3	3		
Nuttalina spp.								1						1	
Fissurella volcano															
Pachygrapsus					4			3	2		1				
Pagurus spp.															
large limpets(>15mm)											1		7		
S. purpuratus									1						
Amphissa versicolor															
Nucella emarginata	1						3				1				
Acanthina spp.			1		3			1	2			2			9
Tegula funnebralis						1									3
Ceratostoma nuttali															
Ocenebra circumtexta			1			2	2	3	5	8			7		
Lottia gigantea															
Pisaster ochraceus															
Littorina spp.	325	2563	413	1363	938	253	197	253	344	1225	100	69	7	34	1
subsample1	3	94	18	48	18	41	24	56	75	37	26	8		9	
subsample2	9	77	11	31	24	16	20	22	14	42	2	1		2	
subsample3	14	34	4	30	33	24	19	3	21	19	4	13		0	
Limpet < 5 mm	9	6	1	13	0	18	41	63	66	19	34	9	2	3	2
subsample1							5	0	2	0	5	2		1	
subsample2							3	14	1	2	3	0		0	
subsample3							5	6	18	4	3	1		0	
Limpet 5-15 mm	19	5	19	9	0	12	15	18	10	0	78	41	19	94	17
subsample1											11	7		5	
subsample2											7	1		18	
subsample3											7	5		7	

zone		Mytilus					Tetraclita				Total Count
plot #	816	817	818	819	820	821	822	823	824	825	
Lepidochitona spp.	2		2		3					2	18
Nuttalina spp.	5	1	4		9	1	2	3	1	7	35
Fissurella volcano	12		4		16	1					33
Pachygrapsus	2	2	5		4	4	1				28
Pagurus spp.					1						1
large limpets(>15mm)								8	5	1	22
S. purpuratus	1	1			3						6
Amphissa versicolor		5	2				1				8
Nucella emarginata	3										8
Acanthina spp.			1								19
Tegula funebris											4
Ceratostoma nuttali				1							1
Ocenebra circumtexta	30	10	5	8	4	5	10	4	3	6	113
Lottia gigantea		1			1		1	3	2		8
Pisaster ochraceus	2										2
Littorina spp.	0	0	0	0	2	113	0	4	32	41	8274
subsample1						0				1	
subsample2						16				4	
subsample3						20				8	
Limpet < 5 mm	41	22	41	134	22	41	81	4	3	59	733
subsample1	7	7	7	7		7	11			4	
subsample2	5	0	2	11		3	9			9	
subsample3	1	0	4	25		3	6			6	
Limpet 5-15 mm	103	197	125	297	127	194	216	88	175	303	2180
subsample1	17	33	23	30		17	35		38	11	
subsample2	6	17	7	29		29	17		12	54	
subsample3	10	13	10	36		16	17		6	32	

Santa Cruz Island March 29-April 2, 2004

(Database event #2004-B)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
David Kushner, Marine Biologist, Channel Islands National Park
Susan Coppelli, Volunteer
Harold Neufeldt, Volunteer
Carol Blanchette, Marine Biologist, PISCO, UCSB
Sean Hoobler, PISCO, UCSB

PROCEDURE and general observations: The *Ocean Ranger* took us to Santa Cruz Island, arriving at Prisoners at approximately 1100 hrs. Standard procedures were used for monitoring the rocky intertidal sites. Motile invertebrates were counted in the photoplots at all sites. All plots and site overviews were photographed with an Olympus 5050 digital camera. Surfgrass transects were read at Trailer and Fraser Cove. Black abalone were searched for in defined areas and measured when encountered. Seastars were counted at all sites. The maximum number of shorebirds and pinnipeds seen at any one time was recorded. Plot repairs were conducted as needed.

29 March 2004, Prisoners Harbor. Low tide +0.4 ft at 1155 hrs, Unseasonably warm and sunny. Very calm conditions allowed us to complete the site without a minus tide. There were no shorebirds or pinnipeds present in the area. We were onsite from 1200-1530 hrs.

The most noticeable change was the high recruitment of mussels into the mussel plots. One year ago, the mussels were gone from the top of the reef, probably due to pig foraging. *Mytilus californianus* from 2 to 20 mm were covering much of the area in all the plots. Some of the algae and surfgrass at the site were bleached, possibly from this warm calm weather. *Silvetia compressa* were dry and crispy, definitely a direct result of the weather. Most of the *S. compressa* were short. Very little *Hesperophycus californica* was present. *Porphyra perforata* was common below the *Hesperophycus* zone, but bleached. Because of the tide level we did not count seastars on 29 March. No abalone were seen but conditions were marginal. Carol Blanchette and Sean Hoobler from PISCO counted 83 *Pisaster ochraceus* on 1 April. No size measurements were made.

There were a fair number of motile invertebrates in most zones. *Nuttalina* spp. were abundant in several mussel plots as were *Ocenebra circumtexta*. *Acanthina* spp. were common in the Endocladia and *Hesperophycus* zones. *Tegula* spp. were not very common. One *Tegula gallina* was found among the 12 total *Tegula* found in plots.

Photoplot summary – mean percent cover by zone at Prisoners Harbor, Santa Cruz Island, spring 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal
Barnacle	34.8	10.0	0.0	17.0	0.2	0.0	1.8	0.0	0.0	36.0	0.2
Endocladia	12.6	12.8	0.0	64.4	5.6	0.0	3.6	0.0	0.0	0.8	0.2
Rockweed	23.8	2.8	0.4	1.4	0.0	32.6	5.2	0.0	0.0	33.2	0.6
Mussels	8.6	12.2	1.8	3.2	0.0	0.0	31.4	0.4	0.0	36.2	6.2
Hespero-phycus	46.4	11.4	0.0	33.2	2.6	0.2	0.4	0.0	0.0	5.8	0.0

Motile invertebrate counts and size frequency measurements for Prisoners Harbor, Santa Cruz Island, spring 2004

	<i>Nucella emarginata</i>	<i>Acanthina</i> spp.	<i>Tegula funebris</i>	<i>Tegula gallina</i>	<i>Ocenebra circumtexta</i>
count	26	48	11	1	44
mean size	17	16	15	11	11
min size	9	9	11	11	5
max size	23	22	20	11	17

zone	Barnacle					Endocladia					Hesperophycus				
plot #	826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
Lepidochitona spp.			1	1	3					3		3			
Nuttalina spp.						1	1	1							
Fissurella volcano															
Pachygrapsus			1			5	2	1		2		1			2
Pagurus spp.															
large limpets(>15mm)										1	1	1	2	1	
S. purpuratus															
Nucella emarginata						1	2	3							
Acanthina spp.				3		1	4	2	4	6	5	1	1		1
Tegula gallina							1								
Tegula funebris							2			5			3		
Ocenebra circumtexta						3	2	1	2	5					
Lottia gigantea															
Bulla/Haminoea				1											
Littorina spp.	10	322	531	559	253	303	181	600	278	294	309	175	218	1500	516
subsample1		1	11	37	24	21	12	32	15	17	15			83	62
subsample2		67	94	63	33	36	10	67	20	38	37			19	59
subsample3		35	65	79	24	40	36	93	54	39	47			18	44
Limpet < 5 mm	5	53	19	0	2	106	84	19	56	34	14	12	7	2	16
subsample1		7	0			14	6		5	1					
subsample2		6	4			8	4		9	2					
subsample3		4	2			12	17		4	8					
Limpet 5-15 mm	7	63	75	20	24	13	0	0	0	28	31	33	23	16	17
subsample1		7	14			2	0		0	4					
subsample2		6	7			1	0		0	2					
subsample3		7	3			1	0		0	3					

Zone	Mytilus						Silvetia				Total Count
plot #	841	842	843	844	845	846	847	848	849	850	
Lepidochitona spp.						5	4	2	4	11	37
Nuttalina spp.		38	41	10	30			4	1		127
Fissurella volcano		2	2	20	7						31
Pachygrapsus			1	1	1	2			3	3	25
Pagurus spp.											0
large limpets(>15mm)								3	2	11	22
S. purpuratus											0
Nucella emarginata				1	3	3		3	9	1	26
Acanthina spp.	2	1		1		7		1	4	4	48
Tegula gallina											1
Tegula funebris									1		11
Ocenebra circumtexta	1	5	8	4	12			1	1	1	46
Lottia gigantea											0
Bulla/Haminoea							1				2
Littorina spp.	1	2	0	0	0	194	34	7	116	55	6458
subsample1						28			20		
subsample2						21			11		
subsample3						13			6		
Limpet < 5 mm	3	32	45	15	650	53	15	38	122	81	1484
subsample1					17	5			20		
subsample2					25	11			14		
subsample3					10	1			5		
Limpet 5-15 mm	4	24	24	10	363	122	120	12	22	98	1147
subsample1					13	11			1		
subsample2					11	16			3		
subsample3					5	12			3		

30 March 2004, Willows Anchorage. Low tide +0.1 ft at 1236 hrs. The weather was sunny and nice; the sea was calm, though there were occasional moderate swells. There were only two Black Oystercatchers at the site but five were seen at the offshore rocks. We were on site from 0900-1400 hrs. PISCO personnel showed up unexpectedly to replace and relocate larval collectors. Photos were taken of the mussel plots with the new collectors nearby.

Seastar numbers seemed lower than last fall, but this was probably just an artifact of the higher tide making it appear so. *Mytilus californianus* recruitment was high, particularly in the upper reaches of the zone. Mussels in the plots were very dense and few snails were found in the motile invertebrate counts. Some of the *Endocladia muricata* was bleached. Bleaching is often noticed during Santa Ana weather conditions. We did not check the beach at Willows, but another group was at Coches Prietos the same day and found numerous *Janthina janthina* shells. These are an interesting pelagic snail not often seen on the islands.

Five black abalone (50-105 mm) were found. A high of 671 *Pisaster ochraceus* were counted in a 30-minute search. A sample of 50 *P. ochraceus* was measured and the colors were noted. The size range was 26-150 mm with a mean of 88 and std dev of 24.

Photoplot summary – mean percent cover by zone at Willows Anchorage, Santa Cruz Island, spring 2004 (5 plots/zone)

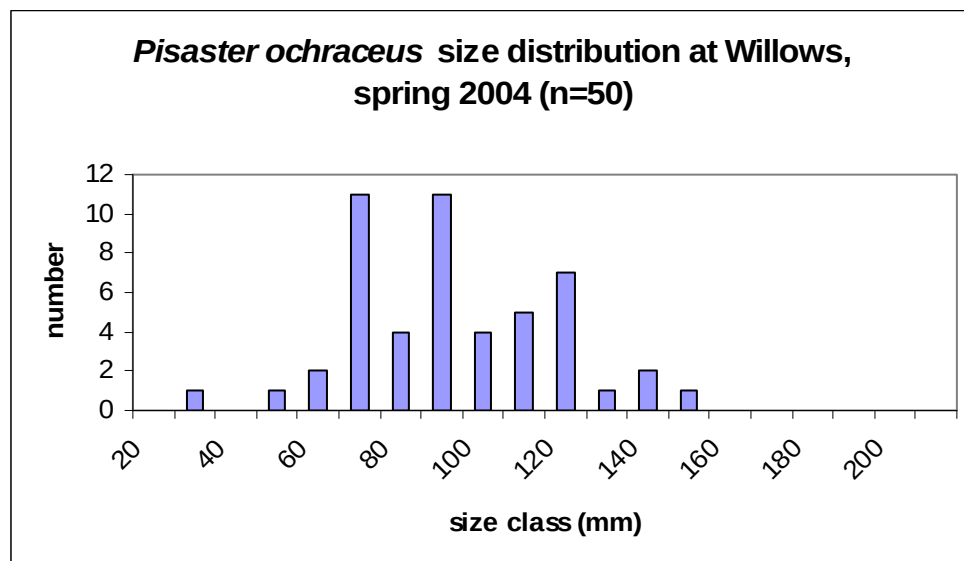
Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal
Endocladia	34.6	4.6	0.6	52.4	0.0	0.0	3.0	0.0	0.0	4.6	0.2
Rockweed	20.2	3.6	0.2	29.2	0.0	37.4	0.0	0.0	0.0	9.4	0.0
Mussels	3.6	2.2	3.0	0.0	0.0	0.0	85.8	0.0	3.0	1.8	0.6
Hespero-phycus	42.8	4.2	0.0	14.2	4.2	27.8	0.2	0.0	0.0	6.6	0.0

Black Abalone (*Haliotis cracherodii*) size distribution for Willows Anchorage, Santa Cruz Island, spring 2004

Site Code	Count	Size (mm)	Mean Size	StDev	Min Size	Max Size	% < 45mm	% 45-126mm	% 127-145mm	% > 145mm
SCWA	5		71.00	22.37	50	105	-	100 %	-	-

***Pisaster ochraceus* color and size classes at Willows Anchorage, Santa Cruz Island, spring 2004**

Willows	orange	brown	purple	total
small (<75mm)	3	10	36	49
med (75-150mm)	99	78	333	510
large (>150mm)	3	0	3	6
total	105	88	372	565 grand total



Motile invertebrate counts and size frequencies at Willows Anchorage, Santa Cruz Island, spring 2004

	<i>Nucella emarginata</i>	<i>Acanthina</i> spp.	<i>Tegula funebris</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
count	16	27	2	8	12
avg size	19	13	18	11	23
min size	16	9	16	8	13
max size	24	18	20	14	43

Zone	Endocladia					Hesperophycus				
plot #	931	932	933	934	935	936	937	938	939	940
Lepidochitona spp.	2		2	2	5		1		7	10
Nuttalina spp.	2			5	3				2	
Fissurella volcano										
Pachygrapsus			3						1	
Pagurus spp.									37	
large limpets(>15mm)				1						1
S. purpuratus										
Nucella emarginata					1					
Acanthina spp.									5	4
Tegula funebris										2
Ocenebra circumtexta										
Lottia gigantea										
Littorina spp.	87	300	259	62	81	228	1022	634	88	36
subsample1		47	21		13	37	97	57		
subsample2		30	28		5	12	99	66		
subsample3		19	34		8	24	131	80		
Limpet < 5 mm	28	59	59	32	38	11	39	81	59	70
subsample1		6	4		4			7		
subsample2		4	8		5			6		
subsample3		9	7		3			13		
Limpet 5-15 mm	27	63	31	29	59	19	29	34	37	46
subsample1		9	3		10			6		
subsample2		5	3		2			2		
subsample3		6	4		7			3		

zone	Mytilus					Silvetia					Total Count
plot #	941	942	943	944	945	946	947	948	949	950	
Lepidochitona spp.	1							24	15	2	71
Nuttalina spp.	27	4	3	2	5		6				59
Fissurella volcano		3									3
Pachygrapsus	8	4	7	1	11			3	3	1	42
Pagurus spp.						4		55	3	3	102
large limpets(>15mm)		2	1	2				6		2	15
S. purpuratus	1	23	8	2						1	35
Nucella emarginata	13	3						1			18
Acanthina spp.						3	7	5		3	27
Tegula funebris											2
Ocenebra circumtexta							1	4	3		8
Lottia gigantea	7	1	1	2	1						12
Littorina spp.	0	0	0	0	1	0	10	8	8	0	2825

subsample1											
subsample2											
subsample3											
Limpet < 5 mm	5	3	5	0	1	65	177	13	0	431	1177
subsample1										26	
subsample2										68	
subsample3										44	
Limpet 5-15 mm	48	18	20	31	15	18	109	21	3	194	851
subsample1										24	
subsample2										15	
subsample3										23	

31 March 2004, Fraser/Forneys Cove. Low tide-0.1 ft at 1308 hrs. the weather was sunny but the swell was high and the wind was moderate. At Forneys Cove there were six Black Oystercatchers, one Whimbrel, one Black Turnstone, and one Bonaparte's Gull on the beach. At Fraser there were 10 Black Oystercatchers, one American oystercatcher, and six Black Turnstones near the beach. We were on site from 1000-1700 hrs.

Carol Blanchette and Sean Hoobler helped out with motile invertebrate counts in the barnacle zone and a seastar count. We were able to finish all but four motile invertebrate counts and one of the surfgrass transects which were completed on 1 April when the tide and surf were both a bit lower. After leaving Fraser Cove, we were able to count motile invertebrates in six of the higher plots at the Trailer site.

Sean counted 81 *Pisaster ochraceus* at Fraser Cove of which 24 were orange colored. We did not measure size frequencies of sea stars. No black abalone were found, though conditions were not the best for searching. Both rockweed species looked good at Forney's Cove. Surfgrass was somewhat abraded and about 50% was bleached; *Phyllospadix* cover was down a little in the transects. *Tegula funebris* was abundant in the Silvetia zone plots and *Nucella emarginata* were abundant in the mussel and goose barnacle plots. *Littorina* spp. were not very abundant in any of the plots. *Pollicipes polymerus* recruits were seen.

Photoplot summary – mean percent cover by zone at Fraser Cove, Santa Cruz Island, spring 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other
Barnacle	12.4	24.8	0.0	16.2	0.0	0.0	0.6	0.0	0.0	46.0	0.0	0.0	0.0
Endocladia	16.8	7.2	0.0	58.0	2.4	0.0	1.0	0.0	0.0	14.6	0.0	0.0	0.0
Rockweed	15.6	1.2	0.0	5.2	7.8	65.6	0.0	0.2	0.0	4.4	0.0	0.0	0.0
Mussels	10.0	3.8	0.0	0.0	0.0	0.0	77.8	0.2	1.4	4.0	2.2	0.0	0.6
Pollicipes	10.0	6.8	1.2	4.4	0.0	0.0	53.6	0.6	9.8	10.4	1.0	0.0	2.2
Tar	29.8	13.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.2	0.0	53.4	0.2
Hespero-phycus	38.6	3.6	0.0	22.0	26.8	6.4	0.0	0.0	0.0	2.4	0.0	0.0	0.2

Surfgrass transects at Fraser Cove, Santa Cruz Island, spring 2004
(additional taxa removed when not represented)

Location: Fraser Cove		Site Code: SCFC		
Date: 31-Mar-04		Recorder: Dan Richards		
<u>Taxa</u>	<u>Transect 1</u>	<u>Transect 2</u>	<u>Transect 3</u>	
Rock	1	4		
Sand			5	
Egregia menziesii		1		
Erect coralline	29	5	17	
Encrusting coralline	1			
other red algae	17	16	15	
Phyllospadix sp. overstory	45	71	62	
Mytilus californianus	2	1		
Anthopleura spp.	4			
Phragmatopoma californica			1	
Chthamalus/Balanus	1	2		
total	100	100	100	

Motile invertebrate counts and size frequency measurements at Fraser and Forney's Cove, Santa Cruz Island, spring 2004

	<i>Nucella emarginata</i>	<i>Acanthina spp.</i>	<i>Tegula funebris</i>	<i>Lottia gigantea</i>	<i>Tegula gallina</i>
count	90	37	68	11	2
avg size	16.89	12.46	14.57	24.18	18
min size	8	5	4	13	18
max size	26	23	25	51	18

<u>Zone</u>	<u>Barnacle</u>					<u>Endocladia</u>				<u>Hesperophycus</u>						
<u>plot #</u>	<u>876</u>	<u>877</u>	<u>878</u>	<u>879</u>	<u>880</u>	<u>881</u>	<u>882</u>	<u>883</u>	<u>884</u>	<u>885</u>	<u>886</u>	<u>887</u>	<u>888</u>	<u>889</u>	<u>890</u>	
Lepidochitona spp.														2	1	
Nuttalina spp.						1	1								1	
Fissurella volcano																
Pachygrapsus									1				1			
Pagurus spp.												6				
large limpets(>15mm)															1	
S. purpuratus																
Nucella emarginata					1	1	2		2	1			1			
Acanthina spp.	3					1					1			1	3	
Tegula gallina						1									1	
Tegula funebris				5							1	26			7	
Ocenebra circumtexta																
Lottia gigantea																
Littorina spp.	322	128	422	116	203	14	48	24	33	22	95	20	145	31	17	
subsample1	34	18	38	17	20											
subsample2	40	11	38	10	29											
subsample3	29	12	59	10	16											
Limpet < 5 mm	0	3	0	19	9	18	18	7	4	15	3	2	3	9	3	
subsample1	0	1	0	0	0											
subsample2	0	0	0	1	0											
subsample3	0	0	0	5	3											
Limpet 5-15 mm	6	3	6	13	13	35	88	35	4	39	32	32	44	45	32	
subsample1	1	0	0	2	0											
subsample2	0	1	0	0	0											
subsample3	1	0	2	2	4											

<u>Zone</u>	<u>Silvetia</u>						<u>Mytilus</u>				<u>Pollicipes</u>					
<u>plot #</u>	<u>896</u>	<u>897</u>	<u>898</u>	<u>899</u>	<u>900</u>	<u>891</u>	<u>892</u>	<u>893</u>	<u>894</u>	<u>895</u>	<u>901</u>	<u>902</u>	<u>903</u>	<u>904</u>	<u>905</u>	
Lepidochitona spp.	1	2	1	1	1		1	2			1			1	1	
Nuttalina spp.	1	1								1	4	2	2	5	1	
Fissurella volcano																
Pachygrapsus	1				1	1	1	3						2	1	
Pagurus spp.		3						1								
large limpets(>15mm)	1															
S. purpuratus																
Nucella emarginata		1			1	5	2	14	8	5	8	10	18	22	16	
Acanthina spp.	4	5	4	8	6	1										
Tegula gallina																
Tegula funebris	10	20	20	22			5									
Ocenebra circumtexta																
Lottia gigantea							3	1	1		1	1	2	1	1	
Littorina spp.	1	2	0	3	4	1	0	0	0	0	0	2	1	1	0	
subsample1																
subsample2																
subsample3																
Limpet < 5 mm	4	2	2	4	5	0	0	0	6	9	7	9	5	15	15	
subsample1																
subsample2																
subsample3																
Limpet 5-15 mm	23	43	37	30	38	19	20	45	39	52	47	30	57	51	72	
subsample1																
subsample2																
subsample3																

<u>Count</u>	<u>Tar</u>					<u>Total</u>
<u>plot #</u>	<u>906</u>	<u>907</u>	<u>908</u>	<u>909</u>	<u>910</u>	<u>Count</u>
Lepidochitona spp.						15
Nuttalina spp.						20
Fissurella volcano						0
Pachygrapsus						12
Pagurus spp.						10
large limpets(>15mm)						2
S. purpuratus						0
Nucella emarginata						118
Acanthina spp.						37
Tegula gallina						2
Tegula funebris						116
Ocenebra circumtexta						0
Lottia gigantea						11
Littorina spp.	116	341	294	163	34	2602
subsample1		38	34	15		
subsample2		52	30	30		
subsample3		19	30	7		
Limpet < 5 mm	0	0	0	1	1	198
subsample1		0	0			
subsample2		0	0			
subsample3		0	0			
Limpet 5-15 mm	0	0	0	0	0	1030
subsample1		0	0			
subsample2		0	0			
subsample3		0	0			

1 April 2004, Trailer. Low tide -0.3 ft at 1335 hrs. The weather was sunny. There was a light breeze inshore but white caps offshore. It was a pleasant day. There were six Black Turnstones and three Black oystercatchers at the site. Two harbor seals watched us from the water. We were on-site from 1045-1430 hrs.

Sean had counted 150 *Pisaster ochraceus* in a 30-minute search on 31 March. I measured 61 and kept track of color. The *P. ochraceus* ranged from 44-120 mm with a mean of 83 mm (SD 17). David conducted a 30-minute search finding six *Haliotis cracherodii* (100-130 mm).

Silvetia compressa was doing very well. *Hesperophycus californica* was doing well but there was not very much of it. *Endocladia muricata* was common. There were some dense patches of *Balanus glandula* and overall it was doing quite well. There were more open patches in the mussel beds than there have been in recent years as the *P. ochraceus* move up the reef. A couple of the mussel plots were affected. *Codium fragile* was common in pools; especially around the area of surfgrass transect 3. *Pollicipes polymerus* recruitment was noted here as well as at Fraser Cove. *Nucella emarginata* were common in the mussel plots and *Tegula funebris* and *Acanthina* spp. were common in both rockweed zones. *Tegula gallina* were found in small numbers.

Photoplot summary – mean percent cover by zone at Trailer, Santa Cruz Island, spring 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal
Barnacle	32.8	62.2	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Rockweed	11.2	0.8	0.0	0.6	0.0	83.2	0.0	0.0	0.0	4.2	0.0
Mussels	13.2	7.4	0.8	0.2	0.0	0.0	56.6	0.0	0.4	21.2	0.2
Hespero-phycus	35.6	5.2	0.0	22.6	9.0	26.2	0.0	0.0	0.0	1.4	0.0

Surfgrass transects at Trailer, Santa Cruz Island, spring 2004
(additional taxa removed when not represented)

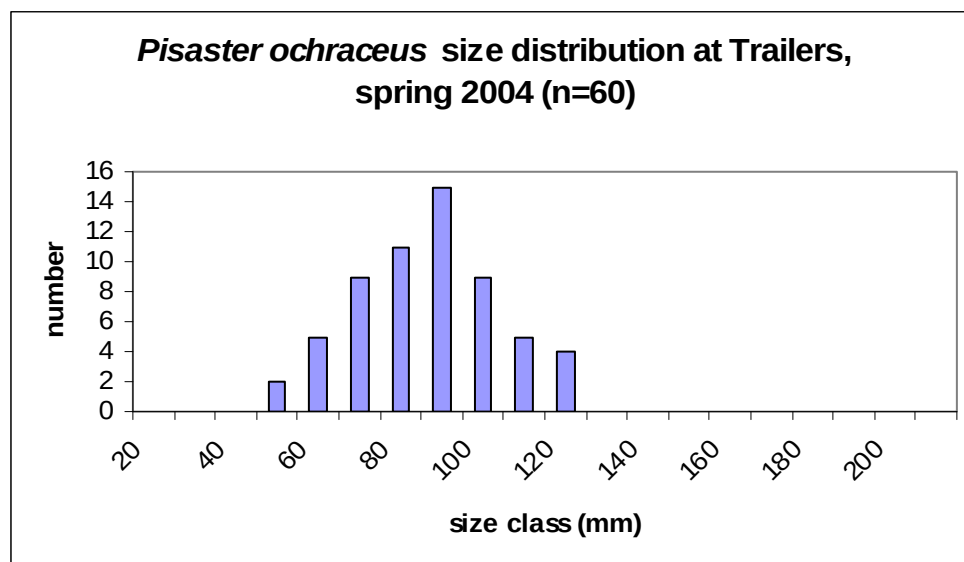
Location: Trailer	Site Code: SCTR		
Date: 1-Apr-04	Recorder: Dan Richards		
Taxa	Transect 1	Transect 2	Transect 3
Phyllospadix sp. overstory	59	53	50
<i>Phyllospadix sp. understory</i>	3	0	1
Rock	1		2
other green algae		3	
<i>Egregia menziesii</i>	6	2	1
Erect coralline	4	3	6
other red algae	29	30	41
<i>Mytilus californianus</i>	1	2	
<i>Phragmatopoma californica</i>		5	
<i>Chthamalus/Balanus</i>		2	
total	103	100	101

Black Abalone (*Haliotis cracherodii*) size distribution for Trailer, Santa Cruz Island, spring 2004

Site Code	Count	Size (mm)	Mean Size	StDev	Min Size	Max Size	% < 45mm	% 45-126mm	% 127-145mm	% > 145mm
SCTR	6		112	13.68	100	130	-	66.67%	33.33%	-

Seastar counts at Trailer, Santa Cruz Island, spring 2004 (*Pisaster ochraceus*)

	orange	brown/purple	Total
small (<75mm)	2	18	20
med (75-150mm)	10	31	41
large (>150mm)	0	0	0
Total	12	49	61



Motile invertebrate counts and size frequency measurements at Trailer, Santa Cruz Island, spring 2004

	<i>Nucella emarginata</i>	<i>Acanthina</i> spp.	<i>Tegula funebris</i>	<i>Lottia gigantea</i>	<i>Tegula gallina</i>
count	40	31	85	6	5
avg size	18	17	18	25	12
min size	12	5	5	17	9
max size	23	23	24	35	15

<i>Zone</i>	<i>Barnacle</i>					<i>Hesperophycus</i>				
<u>plot #</u>	<u>911</u>	<u>912</u>	<u>913</u>	<u>914</u>	<u>915</u>	<u>916</u>	<u>917</u>	<u>918</u>	<u>919</u>	<u>920</u>
Lepidochitona spp.								6		1
Nuttalina spp.										
Fissurella volcano										
Pachygrapsus										1
Pagurus spp.										
large limpets(>15mm)										1
S. purpuratus										
Nucella emarginata										
Acanthina spp.						2	2	3		3
Tegula gallina										
Tegula funebris						3	24	20		10
Ocenebra circumtexta										
Lottia gigantea					1					
Littorina spp.	419	478	259	656	322	100	20	18	38	56
subsample1	30	67	33	55	58	11				
subsample2	74	61	24	93	37	4				
subsample3	30	25	26	62	8	17				
Limpet < 5 mm	22	16	13	3	38	3	1	0	0	1
subsample1	4	1	0	1	8	1				
subsample2	0	1	3	0	2	0				
subsample3	3	3	1	0	2	0				
Limpet 5-15 mm	156	156	153	181	397	81	18	14	6	46
subsample1	13	9	11	7	59	15				
subsample2	15	19	31	22	35	0				
subsample3	22	22	7	29	33	11				

<i>Zone</i>	<i>Mytilus</i>					<i>Silvetia</i>					<i>Total Count</i>
<u>plot #</u>	<u>921</u>	<u>922</u>	<u>923</u>	<u>924</u>	<u>925</u>	<u>926</u>	<u>927</u>	<u>928</u>	<u>929</u>	<u>930</u>	
Lepidochitona spp.					1	5	9	3	7	1	33
Nuttalina spp.	1	3	9	2	1						16
Fissurella volcano			1								1
Pachygrapsus				1	2						4
Pagurus spp.										10	10
large limpets(>15mm)	1					1	1	3	1	1	9
S. purpuratus	1	1	1								3
Nucella emarginata		6	13	14	13	3			1		50
Acanthina spp.						3	1	2	19	5	40
Tegula gallina							1		1	3	5
Tegula funebris						82	115	7	86	142	489

Ocenebra circumtexta											0
Lottia gigantea		1	2	1	1						6
Littorina spp.	5	0	1	0	2	2	1	4	1	3	2385
subsample1											
subsample2											
subsample3											
Limpet < 5 mm	47	31	32	29	26	0	2	1	2	1	267
subsample1											
subsample2											
subsample3											
Limpet 5-15 mm	34	14	18	46	46	26	35	28	10	9	1475
subsample1											
subsample2											
subsample3											

Santa Rosa Island April 7-14, 2004

(Database event #2004-C)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Paula Rich, bio-tech, Channel Islands National Park

PROCEDURE and general observations: We rode the *Ocean Ranger* to Santa Rosa Island, arriving there approximately 1100 hrs. Standard procedures were used for monitoring the rocky intertidal sites. Most photoplots were scored in the field. Motile invertebrates were counted in the photoplots at all sites. All plots and site overviews were photographed with an Olympus 5050 digital camera. Owl limpets were measured at Johnson's Lee, and Northwest-Talcott to more carefully follow the dynamics at those sites. Surfgrass transects were read at Northwest-Talcott and East Point. Black abalone were searched for in defined areas and measured when encountered. Seastars were counted and measured at all sites. The maximum number of shorebirds and pinnipeds seen at any one time was recorded. Plot repairs were conducted as needed. We conducted beachwalk surveys at eight beaches according to standard protocol established for the beachwalk monitoring on Santa Cruz Island. This was done primarily for counting beached organisms as part of the monitoring associated with the bald eagle reintroduction. One bald eagle sighting was made near Officers Beach/Johnson's Lee on 4/11/04 about 0800 hrs

7 April 2004, Soledad Canyon Beach. We conducted a beachwalk survey of the entire beach. On site from 1400-1600 hrs. We had pleasant weather; mostly sunny with a light breeze. We were prevented from walking on to Arlington by the presence of harbor seals with pups on the pocket beach between Soledad and Arlington. We found carcasses of six elephant seals, eight California sea lions, one harbor seal pup and three seabirds (sooty shearwater, western gull, and pacific loon). One of the elephant seal carcasses was a large male about 4m long. The others were all young animals, possibly weaners or 1-2 years old. All of the sea lions were adults including one large male. The shearwater had a fishing hook in its breast. The western gull was actually just wings, breast bone, neck, and head. Live birds were limited to 12 common ravens and eight western gulls which all seemed to be scavenging on the carcasses. Six black oystercatchers were on the rocks to the west. Marine debris included 79 lobster floats and 13 wire traps. Other items were glass bottles, plastic containers, 12 balloons, four trash cans from beaches. Kelp and surfgrass wrack was moderate and beach hoppers and rove beetles were active and abundant as were kelp flies which were swarming on the rocks.

8 April 2004. Arlington/Tecalote Canyon Beaches, China Camp/Cluster Point. Onsite at Arlington and Tecalote beaches from 0915-1045 with cloudy and cool conditions. The wind was light but the swell was moderate. We found carcasses of six young elephant seals, four sea lions, one unidentified pinniped (probably a young sea lion) and one horned grebe. Live birds, on the rocky points, beaches, and flying over, included two peregrine falcons, 42 western gulls, 4 double-crested cormorants, one black oystercatcher, 28 mallard ducks on the lagoons, one American pipit, one common loon (on the beach), one great blue heron, one lesser yellowlegs, four common raven. Debris included 32 wire traps, 75 fishing buoys, plastic bottles and buckets. *Lithopoma undosum* shell were abundant, kelp and surfgrass wrack was moderate for this site but still in large piles. Beach hoppers and rove beetles were active.

We conducted the beachwalk survey at China Camp and Cluster Point beaches in the afternoon from 1410-1515 hours. The breeze had picked up some and it was still cool and cloudy. Only two carcasses were found: a California sea lion adult female and an immature elephant seal. Approximately 1000 elephant seals were on China camp and in the dunes with a few on Cluster Point beach. Shorebirds included six American pipit, 39 western gulls, one black oystercatcher, five black turnstone, and 12 common ravens. There was a moderate kelp wrack on the beach, active beach hoppers, and the usual types of debris in small quantities.

9 April 2004. East Point and Skunk Point Beach. Low tide -0.5 ft at 0759 hrs. Conditions were good with a dense marine layer clearing about noon and cool breeze. A large northerly swell did not impact us too much though we were racing to stay ahead of the incoming tide. We were onsite from 0830-1430 hrs. A peregrine falcon flew over the site as we approached. The only shore birds at the site were four black oystercatchers. Wildflowers were abundant at the point.

Many motile invertebrates in the plots slowed the counts considerably, making the day one of racing ahead of the incoming tide. All the plots were field-scored except the Endocladia zone plots. A 30-minute search was conducted first for abalone and seastars. One *Haliotis cracherodii* (128 mm) and 126 *Pisaster ochraceus* were found.

Tegula funebris were abundant in most of the rockweed plots. One *T. gallina* was found. *Silvetia compressa* was moderately bleached but otherwise looked good. *Hesperophycus californicus* was also common and was well into the Endocladia zone. *Pachygrapsus crassipes* were very abundant and all over the rocks in the surge channels, but only Mytilus plots had many in counts. *Acanthina* spp. were common in most zones, though *Nucella emarginata* were most common in Mytilus zone plots and *Littorina* spp. were most abundant in the barnacle zone.

The brackets for the temperature logger apparently rusted away and the housing and unit were lost.

There were six carcasses on Skunk Point including two immature harbor seals, one adult female sealion, one harbor seal pup, a surf scoter and a western gull. There were also two mummified northern fulmars on the beach south of Skunk Point. Relatively minor amounts of debris were encountered including plastic and glass bottles, straws, fishing floats, and a handful of balloons. Deer and skunk tracks were on present. A few by-the-wind-sailors (*Verella velella*) were washed up. Live birds included 15 western gulls, two semi-palmated plovers, a red-necked phalarope, six least sandpipers, six black oystercatchers, and 17 western snowy plovers north of the point. There were an additional eight snowy plovers between oat point and skunk point. We were surveying the beaches between 1530-1730 hrs.

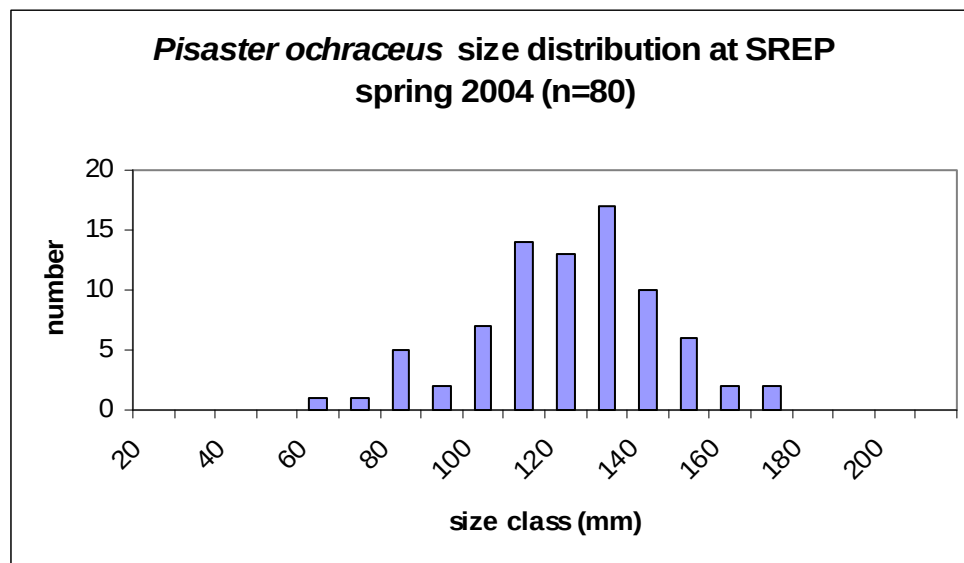
Approximately two dozen harbor seals were seen on the small access beach to Southeast Anchorage.

Photoplot summary – mean percent cover by zone at East Point, Santa Rosa Island, spring 2004 (5 plots/zone)

ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	52.0	20.0	0.0	10.2	15.2	1.6	0.0	0.0	0.0	0.4	0.4	0.2
Endocladia	9.8	0.4	0.0	37.6	42.0	8.6	0.0	0.0	0.0	1.6	0.0	0.0
Rockweed	12.0	0.0	0.0	2.2	0.2	65.0	0.2	0.0	0.0	18.2	2.2	0.0
Mussels	1.2	5.6	0.0	0.6	0.0	0.0	74.8	1.8	0.4	11.8	3.8	0.0
Hespero-phycus	23.8	1.4	0.0	14.0	53.0	4.8	0.0	0.0	0.0	2.6	0.4	0.0

Seastars at East Point, Santa Rosa Island, spring 2004

<i>Pisaster ochraceus</i> Radius (mm)	Total found	(orange)	(purple/brown)
Small (<75)	9	1	8
Medium (75-150)	111	33	78
Large (>150)	6	2	4
<i>Pisaster giganteus</i>	2		
<i>Patiria miniata</i>	2		



Surfgrass transects at East Point, Santa Rosa Island, spring 2004
(additional taxa removed when not represented)

<i>Location</i> East Point		<i>Site Code</i> SREP		
<i>Date:</i> 9-Apr-04		<i>recorder:</i> Dan Richards		
<u>Taxa</u>	<u>Transect 1</u>	<u>Transect 2</u>	<u>Transect 3</u>	
Rock			1	
Sand			2	
Erect coralline			1	
other green algae			2	
other red algae	2		5	
Phyllospadix sp. overstory	98	100	89	
total	100	100	100	

Motile invertebrate counts and size frequency measurements at East Point, Santa Rosa Island, spring 2004

	<i>Nucella sp.</i>	<i>Acanthina spp.</i>	<i>Tegula funebris</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
count	75	118	133	2	12
mean size (mm)	15	14	14	13	17
min size (mm)	9	8	5	12	12
max size (mm)	20	21	21	13	26

<u>Zone</u>	<u>Barnacle</u>				<u>Endocladia</u>						<u>Silvetia</u>				
<u>plot #</u>	<u>575</u>	<u>576</u>	<u>577</u>	<u>578</u>	<u>579</u>	<u>580</u>	<u>581</u>	<u>582</u>	<u>583</u>	<u>584</u>	<u>585</u>	<u>586</u>	<u>587</u>	<u>588</u>	<u>589</u>
Lepidochitona spp.		2	1			6			1	4	15	9	4	28	16
Nuttalina spp.						1		1				1			1
Fissurella volcano			1												
Pachygrapsus		1						1	1	1	1			3	
Pagurus spp.		5									1	9			
Large Limpets															
Nucella emarginata		1	5			3		3		2		2	1	2	2
Acanthina spp.		16	1			18	12	8	7	4	14	12	22	8	9
Tegula funebris		20				7	13	7	3	4	55	59	43	35	23
Strongylocentrotus purpuratus															
Ocenebra circumtexta										1					
Amphissa versicolor															
Lottia gigantea															
Littorina spp.	3775	2725	1163	1413	1013	391	38	716	738	631	2	32	25	6	203
subsample1	84	75	44	34	25	81	3	155	108	106					23
subsample2	126	63	28	38	16	39	6	21	70	62					42
subsample3	92	80	21	41	40	5	3	53	58	34					0
Limpet < 5 mm	0	0	13	28	6	20	13	16	0	4	2	13	9	5	59
subsample1			2	0			1	0	0						13
subsample2			1	2			2	4	0						6
subsample3			1	7			1	1	0						0
Limpet 5-15 mm	1	0	103	88	65	18	19	22	3	4	15	39	23	18	63
subsample1			15	8			0	3	1						11
subsample2			11	11			4	2	0						6
subsample3			7	9			2	2	0						3

	Zone	Hesperophycus					Mytilus					Total Count
	plot #	570	571	572	573	574	590	591	592	593	594	
Lepidochitona spp.		1	2	2	7	1	1		2			102
Nuttalina spp.							10	7	9	6	16	52
Fissurella volcano							5	1	7	4	4	22
Pachygrapsus		1			1	2	15	3	6	16	8	60
Pagurus spp.							1					16
Large Limpets					1				1			2
Nucella emarginata		2	4	1	2	1	34	3	22	20	41	151
Acanthina spp.		6		1	10	1	2			1	1	153
Tegula funebris		12	2	3	7	17	2		2			314
Strongylocentrotus purpuratus							1		1	2		4
Ocenebra circumtexta									1			2
Amphissa versicolor			1									1
Lottia gigantea			1				2		2	3	4	12
Littorina spp.		1063	2538	1913	2588	488	10	66	50	10	81	21673
subsample1		65	64	36	45	10		12	9		10	
subsample2		13	82	81	91	21		3	5		9	
subsample3		7	57	36	71	8		6	2		7	
Limpet < 5 mm		12	22	9	28	0	103	278	103	181	88	1012
subsample1			1	0			7	14	12	17	11	
subsample2			4	0			9	19	11	24	10	
subsample3			2	3			17	56	10	17	7	
Limpet 5-15 mm		41	78	59	12	12	197	169	203	284	266	1801
subsample1			9	3			24	22	33	38	27	
subsample2			10	6			21	9	25	28	32	
subsample3			6	10			18	23	7	25	26	

10 April 2004. Ford Point and Water Canyon Beach. Low tide -0.3 ft at 0920 hrs. Conditions were excellent with low surf, calm air and thick marine layer. Water temperature was 14°C. We were onsite from 0830-1330 hrs. Shorebirds at the site consisted of two black oystercatchers and two black turnstones,

No beached organisms were found at Water Canyon beach. Live birds included two killdeer, a pair of surf scoters resting on the beach, a pair of mallard ducks, one common raven feeding on a red sea urchin, and several western gulls. A pair of eared grebes and 11 western grebes swam just offshore along with a curious harbor seal and a young elephant seal.

At Ford Point, a piece of the lower rock shelf broke right through mussel plot 531. The sandstone rock piece with the plot just settled in the same place, however another block broke off and flipped over lodging against the next shelf inshore. The break must have happened quite recently as there was no growth at all on the new rock faces.

Tegula funebris was common in a few plots and one *T. gallina* was found. All sizes of *Littorina* spp. were found but the tiny snails were especially common. The plots seemed to have quite a diversity of snails and chitons in them. 514 *Pisaster ochraceus* were counted in a 30-minute search. I measured 100 *P. ochraceus* with sizes ranging from 45-140 mm.

As we departed, we noticed three harbor seals on the Ford Point beach. *Phragmatopoma californica* was abundant on the lower reef shelf with *Ulva sp.* and *Anthopleura* as usual. *Pisaster ochraceus* were abundant with many small individuals under 60 mm. Mussels were abundant in a variety of sizes. *Pollicipes polymerus* were common. *Tigriopus* copepods were common in pools as at several sites this week. Both *Balanus* and *Chthamalus* formed dense patches. *Endocladia* was common and widespread but not in large solid patches. *Spirorbis* were common in tidepools. Three black abalone were found.

Photoplot summary – mean percent cover by zone at Ford Point, Santa Rosa Island, spring 2004 (5 plots/zone)

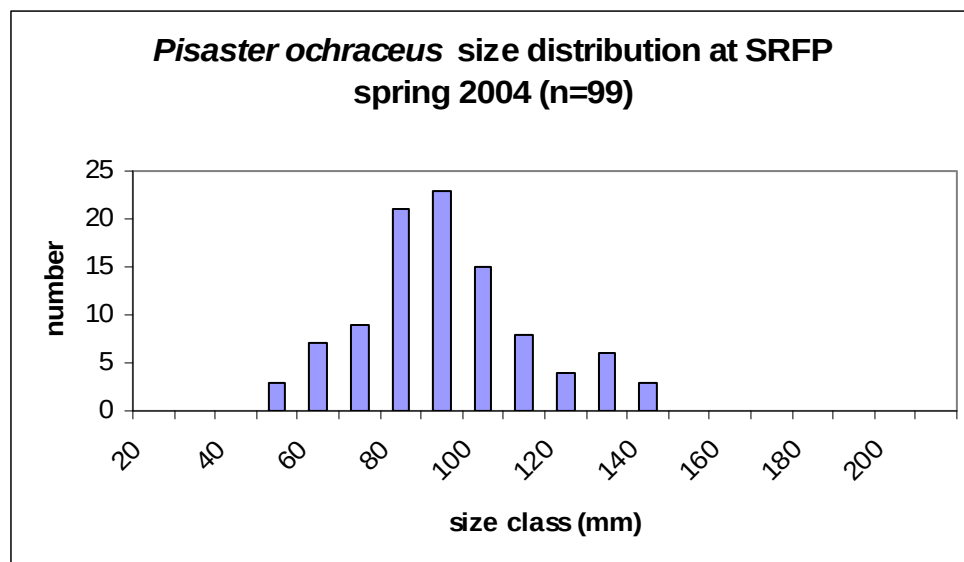
ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	58.4	29.2	0.0	9.0	0.0	0.0	0.2	0.0	0.0	0.0	3.2	0.0
Endocladia	22.2	4.2	0.4	53.4	0.0	0.0	4.2	0.6	0.2	13.6	1.2	0.0
Mussels	27.6	11.4	0.0	0.2	0.0	0.0	35.8	5.8	0.2	13.6	5.4	0.0

***Haliotis cracherodii* at Ford Point, Santa Rosa Island, spring 2004**

SiteCode	Year	Count Sized	Mean Size	StDev	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
FP	2004	3	121.67	43.68	85	170	-	66.67%	-	33.33%

Seastars at Ford Point, Santa Rosa Island, spring 2004

<i>Pisaster ochraceus</i> Radius (mm)	Total found	(orange)	(purple)
Small (<75)	71	10	61
Medium (75-150)	436	107	329
Large (>150)	7	3	4
<i>Pisaster giganteus</i>	3		



Motile invertebrate counts and size frequency measurements at Ford Point, Santa Rosa Island, spring 2004

	<i>Nucella</i> <i>sp.</i>	<i>Acanthina</i> <i>spp.</i>	<i>Tegula</i> <i>funnebralis</i>	<i>Ocenebra</i> <i>circumtexta</i>	<i>Lottia</i> <i>gigantea</i>	<i>Tegula</i> <i>gallina</i>
count	48	3	43	8	9	1
mean size (mm)	17	13	15	11	29	18
min size (mm)	9	9	5	8	17	18
max size (mm)	24	16	24	15	46	18

zone	Barnacle					Endocladia					Mytilus					Total Count
plot #	520	521	522	523	524	525	526	527	528	529	530	531	532	533	534	.
Lepidochitona spp.						1	1			1		1		3		7
Nuttalina spp.						2	2		1	1	6				5	17
Fissurella volcano									1			4	1		1	7
Pachygrapsus	1					1	5	1	2	2	2	1	9	5		29
Pagurus spp.									2							2
large limpets(>15mm)									2						1	3
S. purpuratus						1			3			11	7			22
Nucella emarginata				1		4	2	2	3	8	4	15	1	29	2	71
Acanthina spp.														2	1	3
Tegula funnebralis					1			5	31	18				14	2	71
Tegula gallina								1								1
Ocenebra circumtexta									1					1	5	7
Lottia gigantea							1			2			4	2		9
Littorina spp.	453	1250	1025	1325	675	75	306	538	75	338	194	6	12	213	75	6559
subsample1	18	12	21	39	24	11	16	8	5	13	12	2		23	16	
subsample2	34	82	31	19	10	6	44	22	13	3	27	0		27	5	
subsample3	93	6	30	48	20	7	38	13	6	11	23	0		18	3	
Limpet < 5 mm	7	56	0	363	3	353	522	463	463	688	1913	1388	122	53	700	7091
subsample1		0	0	18	1	40	59	23	39	26	52	27	7	9	31	
subsample2		12	0	3	0	38	89	8	40	23	48	33	15	2	23	
subsample3		6	0	8	0	35	19	6	69	6	53	51	17	6	2	
Limpet 5-15 mm	700	131	69	313	78	134	153	388	219	325	775	63	156	94	106	3703
subsample1	20	12	12	9	10	17	21	9	18	11	13	11	24	14	20	
subsample2	19	16	8	2	7	17	22	10	5	12	26	5	14	11	11	
subsample3	17	14	2	14	8	9	6	12	47	3	23	4	12	5	3	

11 April 2004 Johnson's Lee. Low tide -0.3 ft at 1051 hrs. Overcast morning, clearing about 1000 hrs. with light wind and swell. We were on site from 0830-1400 hrs. Two black oystercatchers, 11 black turnstones, and one surfbird(?) were at the site. We estimated that there were as many as 1000 elephant seals in Johnson's Lee mostly on the beach just west of Officers Beach. A few corner repairs were made, but nothing major was needed.

Phragmatopoma californica was abundant on the lower shelf along with *Ulva* and *Anthopleura sola*. *Pisaster ochraceus* were very abundant and many tiny individuals (<50 mm) were found. No large *Pisaster* were found. Only two black abalone were found (75, 173 mm). *Mytilus*

californianus were abundant on the upper reef shelf and were mostly large, though a variety of sizes were present. Both *Chthamalus* sp. and *Balanus glandula* were present in dense patches. *Endocladia muricata* was widespread but somewhat patchy, at least generally not growing in solid mats. The upper tidepools were active with copepods and spirobis worms.

Photoplot summary – mean percent cover by zone at Johnson's Lee, Santa Rosa Island, spring 2004 (5 plots/zone)

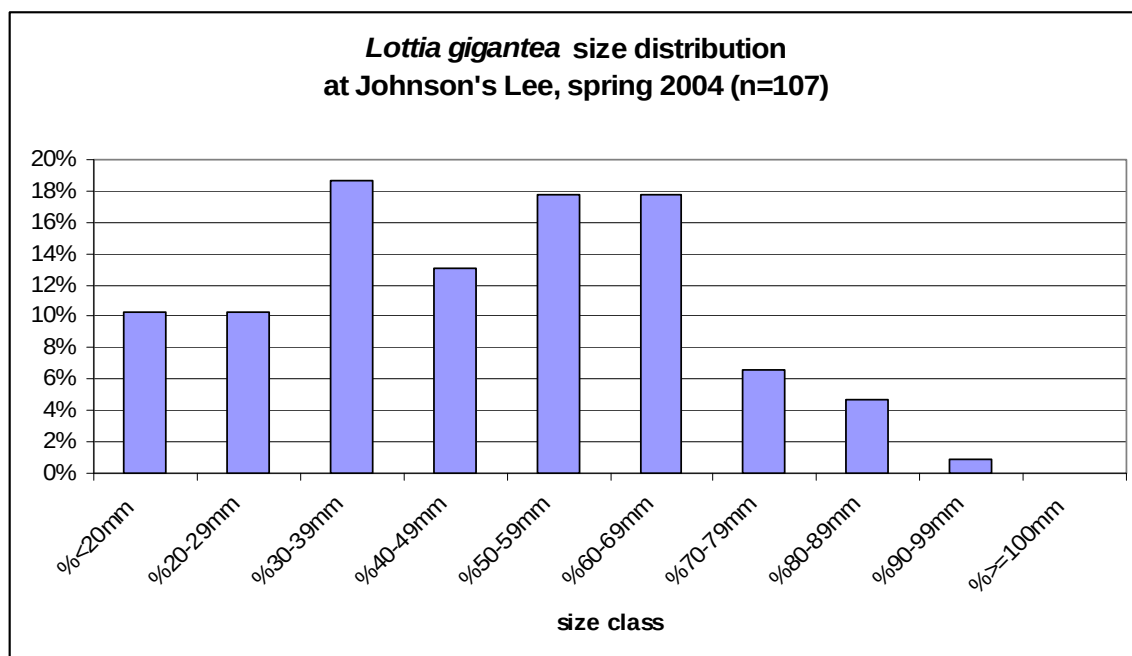
ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	46.6	41.8	0.0	7.4	0.0	0.0	0.4	0.0	0.0	2.2	1.6	0.0
Endocladia	35.0	11.6	0.4	38.2	0.0	0.0	11.4	0.0	0.4	2.2	0.8	0.0
Mussels	9.4	0.8	0.2	0.0	0.0	0.0	15.4	7.4	0.4	13.4	53.0	0.0

***Haliotis cracherodii* at Johnson's Lee, Santa Rosa Island, spring 2004**

SiteCode	Year	Count Sized	Mean Size	StDev	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
JL	2004	2	124.00	69.30	75	173	-	50.00%	-	50.00%

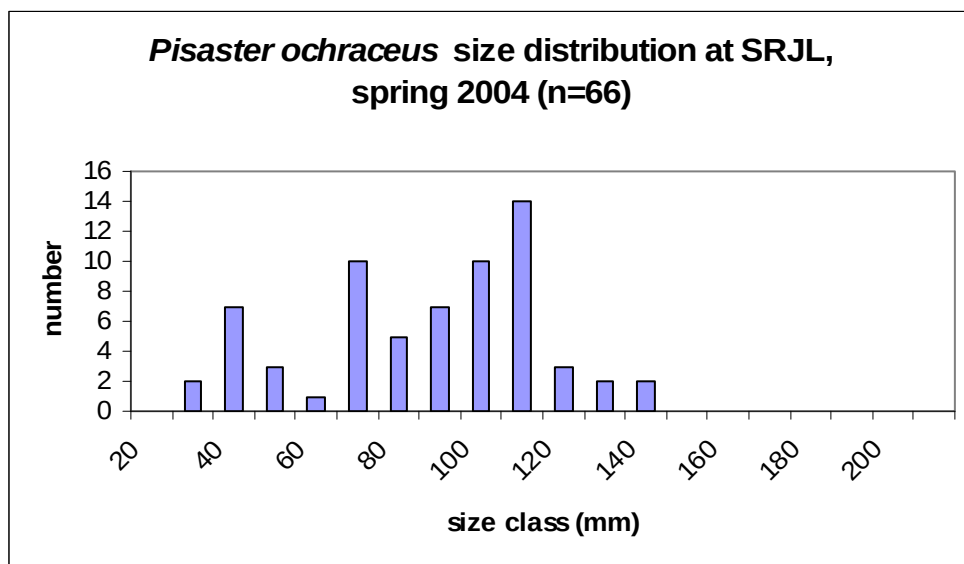
***Lottia gigantea* at Johnson's Lee, Santa Rosa Island, spring 2004**

SiteCode	Plot	Count	MeanSize	StDev	MinSize	MaxSize
JL	595	5	38.40	20.42	16	62
JL	596	18	66.44	13.62	33	87
JL	597	11	48.82	11.23	28	63
JL	598	35	45.26	21.08	13	94
JL	599	38	39.76	17.50	10	67



Seastars at Johnson's Lee, Santa Rosa Island, spring 2004

<i>Pisaster ochraceus</i> Radius (mm)	10x2 m transect	Area 2	Area 3
Small (<75)	6 orange, 23 purple	67 total	9 orange, 39 purple
Medium (75-150)	8 orange, 27 purple	140 total	40 orange, 95 purple
Large (>150)	0	0	0
<i>Pisaster giganteus</i>		1	1



Motile invertebrate counts and size frequency measurements at Johnson's Lee, Santa Rosa Island, spring 2004

	<i>Nucella</i> sp.	<i>Acanthina</i> spp.	<i>Tegula funebris</i>	<i>Lottia gigantea</i>
count	13	2	18	12
mean size (mm)	17	14	10	29
min size (mm)	12	12	5	15
max size (mm)	25	15	19	57

Zone		Barnacle				Endocladia						Mytilus				Total Count
plot #	500	501	502	503	504	505	506	507	508	509	510	511	512	513	514	
Lepidochitona spp.													3			3
Nuttalina spp.						1			2	1	2					6
Fissurella volcano																0
Pachygrapsus									1				9		1	11
Pagurus spp.											1			1	2	4
large limpets(>15mm)						2										2
S. purpuratus															59	59
Nucella emarginata						1	5	1	1	2			3			13
Acanthina spp.											1	1				2
Tegula funebris										5		2	9	1	1	18
Ocenebra circumtexta																0
Lottia gigantea					1	2		2	3				4			12
Amphissa versicolor					1											1

Littorina spp.	2525	2325	625	606	44	46	119	50	125	131	1	0	47	14	0	6658
subsample1	72	31	17	27	2		24	5	17	9			8			
subsample2	29	87	11	58	6		11	9	12	24			7			
subsample3	101	68	22	109	6		3	2	11	9			0			
Limpet < 5 mm	59	50	153	69	444	20	134	81	41	513	35	19	366	32	0	2015
subsample1	16	0	0	8	54		2	5	1	24			112			
subsample2	0	5	25	9	71		30	17	4	6			5			
subsample3	3	11	24	5	17		11	4	8	11			0			
Limpet 5-15 mm	44	225	303	238	341	159	372	306	259	413	7	2	175	37	1	2881
subsample1	8	23	7	28	36		29	37	27	11			19			
subsample2	0	23	51	22	54		50	40	21	4			19			
subsample3	6	26	39	26	19		40	21	35	18			18			

12 April 2004. Northwest-Talcott. Low tide -0.4 at 1210 hrs. Cool and sunny with calm seas. Water temperature was 16°C. We were onsite from 0930-1530hrs. Eight harbor seals, two black oystercatchers and 10 black turnstones were in the area.

Surfgrass, *Phyllospadix* spp., had a high proportion of bleached blades but average cover was over 90% in the three transects. Paula only found three *P. ochraceus* and one *P. giganteus* in the seastar search. Only one black abalone (152mm) was found in the same spot as last November, near plot 570. We measured owl limpets here because we had time. *Tegula funebris* were abundant with both small and large individuals common. A few *T. gallina* were found in the plots. *Neorhodomela larix* and its epiphyte *Soranthra ulvoidea* were common on the flats. *Pachygrapsus crassipes* were very common.

Photoplot summary – mean percent cover by zone at Northwest-Talcott, Santa Rosa Island, spring 2004 (5 plots/zone)

ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	46.0	42.4	0.0	1.6	0.0	6.8	0.0	0.0	0.0	2.2	0.8	0.2
Endocladia	43.4	13.8	0.2	17.8	0.0	13.0	0.0	1.2	0.0	8.2	2.4	0.0
Rockweed	23.2	0.0	0.0	4.2	0.0	69.2	0.0	0.0	0.0	2.4	1.0	0.0
Mussels	23.4	0.0	1.0	0.0	0.0	0.0	51.8	1.0	8.2	10.8	3.8	0.0

***Haliotis cracherodii* at Northwest-Talcott, Santa Rosa Island, spring 2004**

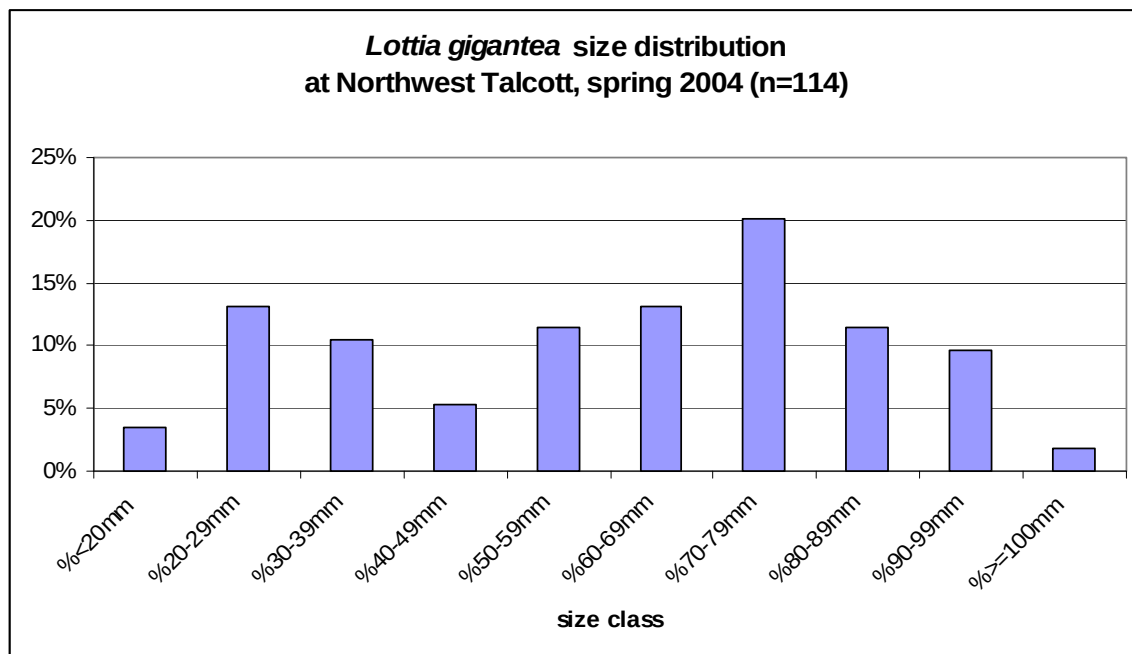
SiteCode	Year	Count Sized	Mean Size	StDev	MinSize	MaxSize	%<45mm	%45-126mm	%127-145mm	%>145mm
NWT	2004	1	152.00		152	152	-	-	-	100.00%

Surfgrass transects at Northwest-Talcott, Santa Rosa Island, spring 2004
(additional taxa removed when not represented)

Location: Northwest-Talcott		Site Code: SRNWT	
Date: 12-Apr-04		recorder: Dan Richards	
<u>Taxa</u>	<u>Transect</u>	<u>Transect</u>	<u>Transect</u>
	<u>1</u>	<u>2</u>	<u>3</u>
Rock	2		
Erect coralline	2	2	
Encrusting coralline		1	
Non-coralline crust			1
other brown algae			3
other green algae			1
other red algae			17
Phyllospadix sp. overstory	96	97	78
<i>Phyllospadix sp. understory</i>			3
total	100	100	103

***Lottia gigantea* at Northwest-Talcott, Santa Rosa Island, spring 2004**

<i>SiteCode</i>	<i>Plot</i>	<i>Count</i>	<i>MeanSize</i>	<i>StDev</i>	<i>MinSize</i>	<i>MaxSize</i>
NWT	701	26	64.35	32.49	15	103
NWT	702	21	63.90	27.03	16	99
NWT	703	33	55.82	19.62	20	89
NWT	704	21	60.14	20.95	20	92
NWT	705	13	56.92	17.17	32	77



**Motile invertebrate counts and size frequency measurements at Northwest-Talcott,
Santa Rosa Island, spring 2004**

	<i>Nucella sp.</i>	<i>Acanthina spp.</i>	<i>Tegula funnebralis</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>	<i>Tegula gallina</i>
count	32	12	24	5	54	2
mean size (mm)	20	15	19	15	31	17
min size (mm)	13	7	8	9	12	15
max size (mm)	32	25	26	22	80	18

Zone	Barnacle					Endocladia				
plot #	560	561	562	563	564	555	556	557	558	559
Lepidochitona spp.				2		1			1	
Nuttalina spp.								1	5	3
Fissurella volcano										
Pachygrapsus		2				1				
Pagurus spp.										
large limpets(>15mm)				2		5		1		4
S. purpuratus										
Nucella emarginata										1
Acanthina spp.				4		4	2	1		
Tegula funnebralis				8			1	5		
Tegula gallina				1						
Ocenebra circumtexta				1			1			1
Lottia gigantea										3
Leptasterias hexactis										
Littorina spp.	2875	419	132	8	838	2	7	1	253	35
subsample1	126	41			23				22	
subsample2	61	77			17				35	
subsample3	43	16			27				24	
Limpet < 5 mm	4	25	10	11	563	4	15	8	234	29
subsample1					15				16	
subsample2					19				36	
subsample3					11				23	
Limpet 5-15 mm	13	2	103	47	41	21	54	72	363	60
subsample1									39	
subsample2									33	
subsample3									44	

Zone	Silvetia					Mytilus					Total Count
plot #	565	566	567	568	569	550	551	552	553	554	-
Lepidochitona spp.	4	3	12	3	1						27
Nuttalina spp.						6		8	8	10	41
Fissurella volcano						1	5	2	3	1	12
Pachygrapsus		1	4			9	9	8	3	8	45
Pagurus spp.							1				1
large limpets(>15mm)	8	7	10		7	1	2		2	1	50
S. purpuratus							1		1		2
Nucella emarginata		1				6	2	9	9	4	32
Acanthina spp.		1									12
Tegula funnebralis	6	3		1							24

Tegula gallina	1										2
Ocenebra circumtexta						1			1		5
Lottia gigantea						14	9	10	12	28	76
Leptasterias hexactis										1	1
Littorina spp.	35	7	22	15	0	2	18	2	0	0	4670
subsample1											
subsample2											
subsample3											
Limpet < 5 mm	0	0	0	1	0	7	23	12	12	10	968
subsample1											
subsample2											
subsample3											
Limpet 5-15 mm	17	9	48	39	34	94	96	110	108	130	1461
subsample1											
subsample2											
subsample3											

13 April 2004. Fossil Reef and Sandy Point Beach. Low tide -0.5 ft at 1308 hrs. Clear but cold and windy. Water temperature as 14°C. We walked Sandy Point between 0900 and 1030 then worked the Fossil Reef site from 1050-1600 hrs. It was clear but the Northwest wind was strong and cold. Fortunately the swell was still low. We had six harbor seals and three young elephant seals at the site this morning. Seven black oystercatchers were on the reef.

Sandy Point beach had a moderate amount of kelp wrack and fresh tar pancakes. There were at least 43 elephant seals, most at the south end, two black oystercatchers, and about 80 western gulls attracted to the seal carcasses. Numerous marine mammal carcasses included 14 immature elephant seals, one adult female California sea lion, two harbor seal pups, and one grampus dolphin. Debris included the usual plastic bottles, rope, fishing floats, and a tire.

Paula found 133 *Pisaster ochraceus*; most were over 100 mm. We did not count seastars in the transect on the mussel reef. Nine black abalone (92-140 mm) were found in the old tagging area. No abalone were found in the plots. *Tegula funebris* were common with many small ones less than 12 mm. A few *T. gallina* were found. *Littorina* spp. were abundant and most in the plots were tiny, however larger littorines were common around the high pools. *Sargassum muticum* was abundant in pools on the reef flat. Surfgrass was pretty bleached and abraded here. *Silvetia compressa* was sparse overall and the plants were mostly older. There was little sign of recent recruitment. The mussels below the upper limit of *Pisaster ochraceus* were sparse, and most of the area was blanketed by *Phragmatopoma californica*.

Photoplot summary – mean percent cover by zone at Fossil Reef, Santa Rosa Island, spring 2004 (5 plots/zone)

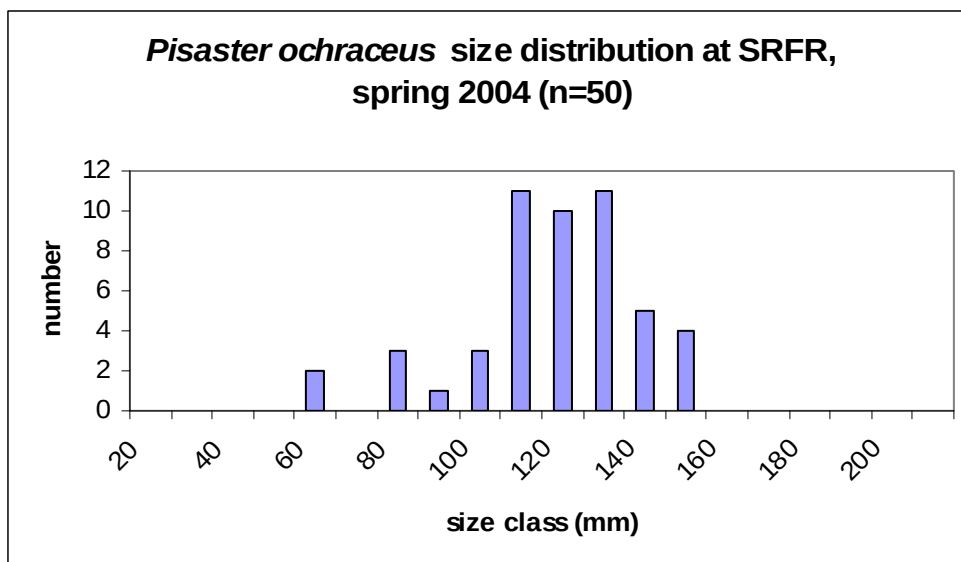
ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	66.2	26.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.8	2.4
Endocladia	47.2	17.8	0.0	19.4	0.0	6.2	0.0	0.0	0.0	8.2	1.2	0.0
Rockweed	55.6	7.2	0.0	11.6	0.0	15.2	0.0	0.0	0.0	8.8	1.6	0.0
Mussels	10.2	3.6	7.2	0.4	0.0	0.0	17.2	7.6	2.2	36.2	15.4	0.0

***Haliotis cracherodii* at Fossil Reef, Santa Rosa Island, spring 2004**

SiteCode	Year	Count Sized	Mean Size	StDev	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
FR	2004	9	121.44	16.46	92	140	-	55.56%	44.44%	-

Seastar counts at Fossil Reef, Santa Rosa Island, spring 2004

<i>Pisaster ochraceus</i> Radius (mm)	Total found
Small (<75)	14
Medium (75-150)	168
Large (>150)	1
<i>Pisaster giganteus</i>	1



**Motile invertebrate counts and size frequency measurements at Fossil Reef,
Santa Rosa Island, spring 2004**

	<i>Nucella</i> sp.	<i>Acanthina</i> spp.	<i>Tegula</i> <i>funnebralis</i>	<i>Ocenebra</i> <i>circumtexta</i>	<i>Lottia gigantea</i>
count	18	32	63	4	21
mean size (mm)	16	15	17	11	21
min size (mm)	7	9	6	9	14
max size (mm)	20	19	25	14	32

zone	<i>Barnacle</i>					<i>Endocladia</i>				
plot #	605	606	607	608	609	610	611	612	613	614
Lepidochitona spp.									3	1
Nuttalina spp.										
subsample1										
subsample2										
subsample3										
Fissurella volcano										
Pachygrapsus						2			2	1
Pagurus spp.										1
large limpets(>15mm)								4	1	8
S. purpuratus										
Nucella emarginata										
Acanthina spp.						5		1	11	3
Tegula funnebralis						6		8	2	44
Ocenebra circumtexta										
Lottia gigantea										
Mopalia										
Leptasterias										
Littorina spp.	675	613	550	638	700	388	700	156	363	181
subsample1	21	13	10	30	26	18	10	13	12	18
subsample2	29	15	10	13	25	4	17	17	15	26
subsample3	4	21	24	8	5	9	29	20	2	14
Limpet < 5 mm	75	0	0	0	19	0	13	9	13	59
subsample1	6	0	0	0	1	0	0	3	1	1
subsample2	0	0	0	0	4	0	1	0	0	12
subsample3	0	0	0	0	1	0	3	0	3	6
Limpet 5-15 mm	138	0	38	0	38	50	178	269	25	172
subsample1	3	0	1	0	4	4	12	22	3	11
subsample2	5	0	2	0	4	7	27	26	3	23
subsample3	3	0	9	0	4	5	18	38	2	21

zone	<i>Silvetia</i>					<i>Mytilus</i>					Total Count
plot #	615	616	617	618	619	620	621	622	623	624	
Lepidochitona spp.		1	1	4	4			1		1	16
Nuttalina spp.						38	46	19	15	97	215
subsample1										28	
subsample2										3	
subsample3										0	

Fissurella volcano									1	1	2
Pachygrapsus			1	2	2	3	4	13	6	2	38
Pagurus spp.				6		1					8
large limpets(>15mm)		1	1					1	1		17
S. purpuratus						8	4	7	12	6	37
Nucella emarginata							1	6	11		18
Acanthina spp.		5	1	2	4						32
Tegula funebris		23	22	160	7						272
Ocenebra circumtexta						1	3				4
Lottia gigantea							1	20	19		40
Mopalia				1							1
Leptasterias								1	1		2
Littorina spp.	1538	413	106	0	72	1	1	19	1	0	7112
subsample1	32	9	20	0	9			4			
subsample2	41	5	7	0	8			0			
subsample3	50	19	7	0	6			2			
Limpet < 5 mm	6	78	9	25	28	184	563	197	363	6	1647
subsample1	0	1	0	7	0	27	13	25	13	2	
subsample2	2	13	1	0	4	27	15	21	5	0	
subsample3	0	11	2	1	5	5	17	17	11	0	
Limpet 5-15 mm	91	113	63	116	119	81	91	131	150	9	1869
subsample1	13	4	10	15	9	21	13	19	10	3	
subsample2	4	17	1	11	7	5	9	15	23	0	
subsample3	12	15	9	11	22	0	7	8	15	0	

San Miguel Island May 6-11, 2004

(Database event #2004-D)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Paula Rich, Biological Technician, Channel Islands National Park
Bill Strojny, Volunteer

PROCEDURE and general observations: We flew out to San Miguel Island with Channel Islands Aviation arriving on the island about 1040 hours. Standard procedures were used for monitoring the rocky intertidal sites. Motile invertebrates were counted in the photoplots at all sites. All plots and site overviews were photographed with an Olympus 5050 digital camera. Black abalone were searched for in defined areas and measured when encountered. Seastars were counted and measured at all sites. The maximum number of shorebirds and pinnipeds seen at any one time was recorded. Plot repairs were conducted as needed. We conducted beachwalk surveys at eight beaches according to standard protocol established for the beachwalk monitoring on Santa Cruz Island. This was done primarily for counting beached carcasses as part of the monitoring associated with the bald eagle reintroduction

6 May 2004, Simonton Cove beachwalk survey. We hiked over to Simonton, checking on the beach spectacle pod, which seemed to be doing well. We found carcasses of four California sea lions (1 male, 2 female and one immature), four immature elephant seals, one northern fulmar, and one western gull (barely more than wings and skeleton). Live shore birds were one black-bellied plover and 22 whimbrels. There was one live elephant seal on the beach. The usual debris of mostly fishing floats, some heavy line, glass bottles, light bulbs, balloons, shoes, and plastic bottles was present. By-the-wind-sailors, *Velella velella*, were washed up on the beach in high numbers and their dried sails were in piles on the upper beach. Dried pieces of *Nereocystis lutkeana* were scattered along the beach. A peregrine falcon pair was seen over the north end of the beach. We stopped at the old station site in the canyon and pulled about two dozen fireweed plants.

7 May 2004, Cuyler Harbor. Low tide -1.2 ft at 0652hrs, Wind and swell were light but picked up as the day went on. The sky was clear and air temperature was pleasant. Five black oystercatchers were seen at the site, there were 13 elephant seals in the water immediately off the site, watching us. Approximately 100 western gulls and 50 elephant seals occupied the east end of Cuyler Harbor beach. We were on site from 0710-1245 hrs. We conducted a beachwalk survey of Cuyler Harbor on the way back.

Paula and Bill started measuring seastars right away while I started the field log and then counted motile invertebrates. Paula shot the photos and field scored all the plots. Some minor repairs were made, including new corners at 406 and 412 and additions to others.

Nucella emarginata were abundant in the mussel plots. Small *Lottia gigantea* were also very common in the mussel zone. Large *N. emarginata* (>25mm) were fairly common. *Tegula funebris* were common in several Endocladia and Silvetia plots but not all. *Littorina* spp. were mostly larger than 5mm and were present in all zones, though only abundant in the barnacle plots. *Mytilus californianus* were abundant and large, though a fair number of small (<10mm)

mussels nestled among the larger shells. *Endocladia muricata* was lush and common throughout the site. *Silvetia compressa* was common and doing well. There were about four clumps of *Hesperophycus californicus* just above plot 409. *Phragmatopoma californica* was abundant but most of the colonies were overgrown by algae. Some of the algae in the low intertidal zones along with surfgrass were bleached, probably from the low tides and warm days recently. No black abalone were found.

On the beach survey we found carcasses of common loon, two pelagic cormorants, one adult female California sea lion, and four harbor seal pups. Both cormorants were in breeding plumage and appeared to be predated. The cause of death could not be determined for any others. We only surveyed the beach east of Nidever Canyon. Many elephant seals were present on the western portion of beach.

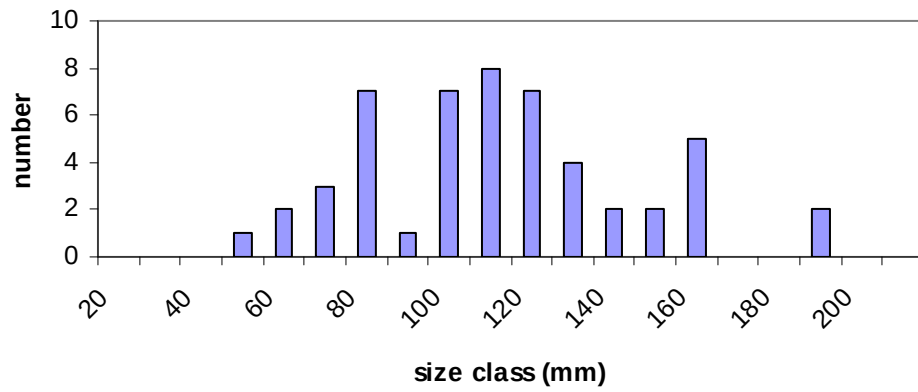
Photoplot summary – mean percent cover by zone at Cuyler Harbor, San Miguel Island, spring 2004 (5 plots/zone)

ZoneName	Bare Rock	Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	31.0	39.0	0.0	29.8	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Endocladia	21.2	2.8	0.4	41.4	0.0	10.0	5.8	0.6	0.2	16.8	0.8	0.0
Rockweed	14.4	0.0	0.4	0.2	0.0	68.8	0.4	0.2	0.0	12.0	3.6	0.0
Mussels	19.4	1.8	4.0	0.0	0.0	0.0	57.8	0.0	3.8	5.6	7.6	0.0

**Seastar counts at Cuyler Harbor, San Miguel Island, spring 2004
(*Pisaster ochraceus* sizes and colors)**

	brown	orange	purple	Total
<75mm	12	2	1	15
75-150mm	49	12	6	67
>150mm	10	3	0	13
Total	71	17	7	95 grand total
other sp.	<i>P. giganteus</i>	2		

***Pisaster ochraceus* size distribution at Cuyler harbor, spring 2004 (N=51)**



**Motile invertebrate counts and size frequency measurements for Cuyler Harbor,
San Miguel Island, spring 2004**

	<i>Acanthina</i> <i>spp.</i>	<i>Nucella</i> <i>emarginata</i>	<i>Tegula</i> <i>funnebralis</i>	<i>Ocenebra</i> <i>circumtexta</i>	<i>Lottia</i> <i>gigantea</i>
Count	27	93	73	16	56
Mean (mm)	13	20	20	13	25
Min (mm)	7	10	8	9	15
Max (mm)	19	29	26	17	40

Zone	Barnacle					Endocladia					Silvetia				
plot #	416	417	418	419	420	411	412	413	414	415	406	407	408	409	410
Lepidochitona spp.			1			1		5			4		3	7	10
Nuttalina spp.						2	3	1		2	5	1	1	2	1
Fissurella volcano															
Pachygrapsus						4	1	7	2	3	1	2	2	7	3
Pagurus spp.											1	3			
large limpets(>15mm)	1					3		1				3		1	
Nucella emarginata			1			8	8	3		2	5	1	8	2	2
Acanthina spp.					1	1		12	2	1	5	2	2	3	
Tegula funnebralis			1		1	8		21	21	26	18	21		16	1
Ocenebra circumtexta							1	4		1	17			5	4
Lottia gigantea						2					20		3		3
Strongylocentrotus purpuratus															1
Leptasterias hexactis															1
Littorina spp.	531	600	1025	700	209	37	170	107	90	19	30	12	52	14	32
subsample1	55	44	29	20	17										
subsample2	53	63	46	21	39										
subsample3	62	85	7	15	11										
Limpet < 5 mm	1	1	1	0	2	3	3	2	10	26	1	1	0	0	0
Limpet 5-15 mm	5	3	19	2	12	48	23	15	25	41	16	12	12	17	13

zone	Mytilus					Total Count
Plot #	401	402	403	404	405	
Lepidochitona spp.						31
Nuttalina spp.	7	3	3	18	16	65
Fissurella volcano			1			1
Pachygrapsus	8	5	8	5	9	67
Pagurus spp.						4
large limpets(>15mm)					1	10
Nucella emarginata	41	45	24	46	21	217
Acanthina spp.						29
Tegula funnebralis						134
Ocenebra circumtexta						32
Lottia gigantea	9	9	9	14	17	86
Strongylocentrotus purpuratus			2			3
Leptasterias hexactis		1				2
Littorina spp.	1	0	0	0	0	3630
Limpet < 5 mm	3	9	2	18	3	86
Limpet 5-15 mm	87	119	98	104	50	721

8 May 2004, Harris Point. Low tide -1.0 ft at 0754 hrs. The conditions were sunny, but windy and cool. Water temperature was 14°C. There was a harbor seal and a sea lion at the site when we arrived. The sea lion stayed around and was not acting normal but did not appear to be injured. I suspect it may be affected by Domoic Acid. There was one elephant seal watching us from the water most of the day. Three black oystercatchers were flying around all day. We were on site from 0800 to 1530 hrs.

Some *Velella velella* were washed up on the rocks at the site. Secret Cove beach was loaded with *V. velella*. Algae were very dense at the site. *Chondracanthus canaliculatus* and *Mastocarpus papillatus* were both especially dense. *Egregia menziesii* and *Laminaria setchelli* were abundant in the lowest zone. *Costaria costata*, an uncommon kelp at the islands, was present on the lower zones of the western part of the site. I don't recall it being present here before or at least not so noticeable. This is the first time I've seen it in that area. *Pachygrapsus crassipes* were abundant.

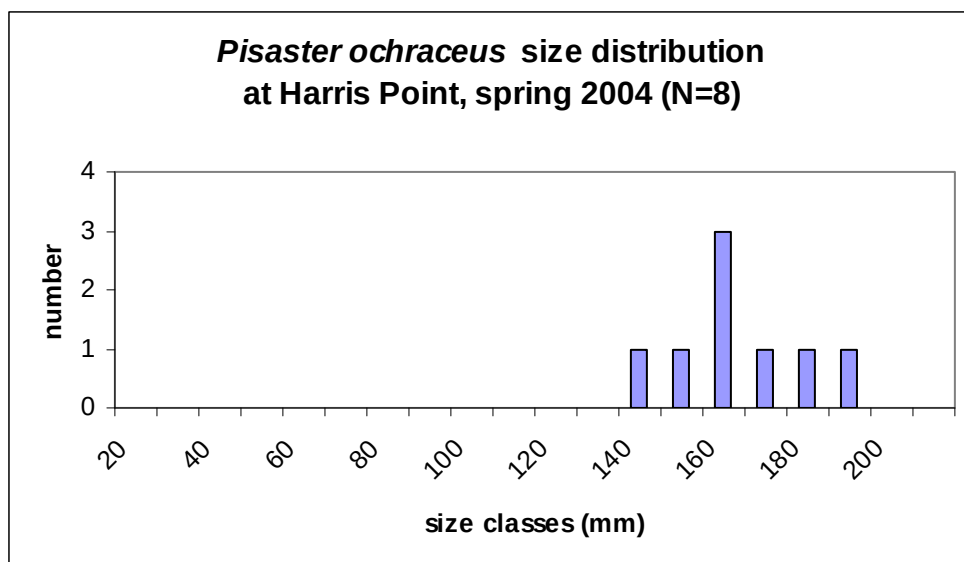
A total of 19 *Haliotis cracherodii* were found, two of them were in plot 443. No other plots had abalone. There were three groupings of abalone (abalone within one meter or less of each other) accounting for 10 of the 19. Red algae and tunicates were covering the rocks in plot 444. *Anthopleura elegantissima* were growing on the rock crevice in plot 445 and across from plot 442. Seastar numbers are typically low at this site. The total found this time was only eight *Pisaster ochraceus*, the same as last fall. Three *Patiria miniata* and one *P. giganteus* were also found.

Photoplot summary – mean percent cover by zone at Harris Point, San Miguel Island, spring 2004 (5 plots/zone)

ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	31.4	65.2	0.0	2.2	0.0	0.0	0.0	0.0	0.0	0.0	0.2	1.0
Endocladia	24.0	20.2	1.0	30.6	14.6	0.0	2.4	0.4	0.0	6.6	0.2	0.0
Mussels	22.2	8.0	4.4	6.2	0.8	0.0	40.8	0.0	0.6	16.4	0.6	0.0
Tetraclita	22.4	16.0	16.2	5.4	0.0	0.0	12.0	0.6	0.4	21.2	2.0	3.8
Hesperophycus	19.6	1.4	0.0	18.6	58.0	0.0	0.0	0.4	0.0	2.0	0.0	0.0

Seastar counts at Harris Point, San Miguel Island, spring 2004 (*Pisaster ochraceus* sizes and colors)

	brown	orange	purple	total
<75mm	0	0	0	0
75-150mm	2	0	0	2
>150mm	5	1	0	6
Total	7	1	0	8 grand total



Black abalone at Harris Point, San Miguel Island, spring 2004

Site Code	Count Sized	Mean Size	StDev	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
HP	19	108.63	17.46	70	145	-	84.21%	15.79%	-

Motile invertebrate counts and size frequency measurements for Harris Point, San Miguel Island, spring 2004

	<i>Nucella emarginata</i>	<i>Tegula funebris</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
Count	63	12	30	50
Mean size (mm)	18	22	16	23
Min (mm)	8	10	6	9
Max (mm)	27	28	21	46

zone	Barnacle					Endocladia					Hesperophycus				
plot #	440	B1	B2	B3	B4	431	432	433	434	435	421	422	423	424	425
Lepidochitona spp.						2		1		1					
Nuttalina spp.						2						1			
Fissurella volcano															
Pachygrapsus						1						1			
Pagurus spp.															2
large limpets(>15mm)						1	2			3		2	1		2
Nucella emarginata															
Acanthina spp.															
Tegula funebris															
Ceratostoma nuttali															
Ocenebra circumtexta					1	3									
Lottia gigantea						2									
S. purpuratus															

Amphissa versicolor															
Littorina spp.	825	597	988	644	669	55	497	263	125	181	169	206	113	100	353
subsample1	16	12	18	71	91		9	37	23	23	13	18	2	12	26
subsample2	26	62	26	55	66		59	19	9	14	30	28	8	13	28
subsample3	24	117	35	80	57		91	28	8	21	11	20	26	7	59
Limpet < 5 mm	0	1	4	0	0	3	25	25	56	6	0	3	3	22	13
subsample1							1	0	1	0	0	0	0	2	0
subsample2							0	3	4	2	0	1	0	4	1
subsample3							7	5	13	0	0	0	1	1	3
Limpet 5-15 mm	50	7	17	1	7	115	53	84	103	31	53	44	53	72	22
subsample1	5						7	2	2	2	5	1	0	2	2
subsample2	6						6	9	6	7	4	8	5	12	3
subsample3	5						4	16	25	1	8	5	12	9	2

<i>Zone</i>	<i>Mytilus</i>					<i>Tetraclita</i>					<i>Total Count</i>
<u>plot #</u>	<u>426</u>	<u>427</u>	<u>428</u>	<u>429</u>	<u>430</u>	<u>436</u>	<u>437</u>	<u>438</u>	<u>439</u>	<u>T1</u>	
Lepidochitona spp.		9				1			2		16
Nuttalina spp.	4		1		3	18	30	1	9	14	83
Fissurella volcano					1						1
Pachygrapsus	6	2			7	3	2	1	6	4	33
Pagurus spp.									3		5
large limpets(>15mm)		4	6	1	2			1	4	1	30
Nucella emarginata	5	10	5	5	6	20	10	2	12	9	84
Acanthina spp.											0
Tegula funebris				1				11	1		13
Ceratostoma nuttali											0
Ocenebra circumtexta		3	7					16	13		43
Lottia gigantea	10	1			6	23	36			18	96
S. purpuratus				3	8						11
Amphissa versicolor			1								1
Littorina spp.	19	16	119	91	3	11	5	9	19	9	6084
Subsample1			29					3	6		
Subsample2			5					0	0		
subsample3			4					0	0		
Limpet < 5 mm	7	106	47	15	19	3	47	56	81	38	581
subsample1		10	1				5	9	14		
subsample2		13	6				1	7	11		
subsample3		11	8				9	2	1		
Limpet 5-15 mm	82	247	234	126	132	112	188	103	147	144	2227
subsample1		25	23				30	13	22		
subsample2		30	25				15	7	20		
subsample3		24	27				15	13	5		

9 May 2004, Crook Point. Low tide -0.7 ft at 0905 hrs. Another sunny, windy, and cold day. There was high surf keeping the outer reef wet all day. Water temperature was 12°C. Five elephant seals were at the site and 20-30 were on the beach to the east. Four black oystercatchers, one American oystercatcher and one black turnstone were at the site. We were on site from 0745-1330 hrs.

The wind was pretty miserable but we managed to get it all done without incident, (though we did enjoy some refreshing sea spray). Lush algae adorned much of the site. I found several clumps of *Analipus japonica*. *Plocamium violaceum* was abundant in the outer edge of the reef shelf.

Seven black abalone were found in a 30-minute search ranging from 60-129 mm. No abalone were found in the plots. All of the abalone were singles. Paula measured *Pisaster ochraceus*, finding 57 in a 30 minute search, down from 122 last fall. The stars today were fairly cryptic and not very obvious. Most were relatively small, none were over 140 mm. Heavy surf may have limited our ability to find seastars and abalone. Paula scored all but four of the plots in the field. Motile invertebrates were not common except for *Littorina* spp. and small limpets. *Pachygrapsus crassipes* were common but not as abundant as at Harris Point and Cuyler Harbor.

I found the weed Tocolote (a star-thistle relative) growing in the trail on San Miguel Peak and a few plants coming up the backside of the peak. Both populations were relatively small areas so I stopped to pull all the plants that I could find. I pulled several hundred plants and bagged them.

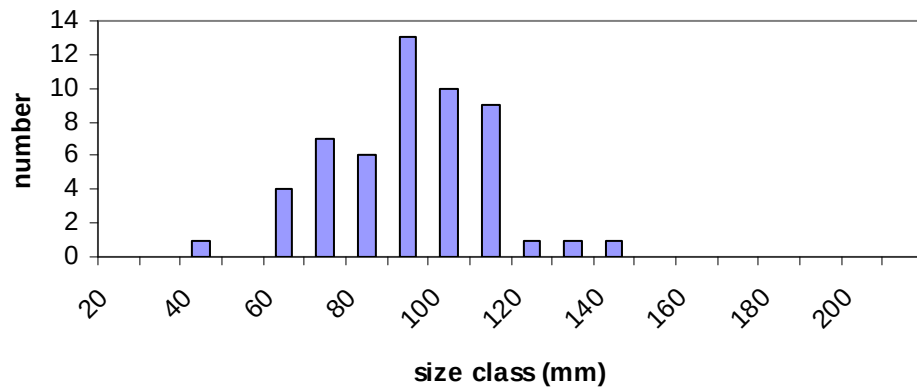
Photoplot summary – mean percent cover by zone at Crook Point, San Miguel Island, spring 2004 (5 plots/zone)

ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	55.4	41.8	0.0	2.0	0.0	0.0	0.6	0.0	0.0	0.0	0.2	0.0
Endocladia	27.6	19.8	0.8	30.6	6.0	0.2	9.0	0.0	1.4	4.0	0.6	0.0
Rockweed	37.0	11.4	1.4	9.4	1.4	1.0	27.0	1.6	1.0	8.6	0.2	0.0
Mussels	5.0	5.0	0.4	0.2	0.0	0.0	80.6	0.6	1.4	6.6	0.2	0.0

Seastar counts at Crook Point, San Miguel Island, spring 2004 (*Pisaster ochraceus* sizes and colors)

	brown	orange	purple
<75mm	10	3	0
75-150mm	35	8	1
>150mm	0	0	0

***Pisaster ochraceus* size distribution at Crook
Point, spring 2004 (N=53)**



Black Abalone at Crook Point, San Miguel Island, spring 2004

Site Code	Count Sized	Mean Size	StDev	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
CP	7	93.43	20.40	60	129	-	85.71%	14.29%	-

Motile invertebrate counts and size frequency measurements at Crook Point, San Miguel Island, spring 2004

	<i>Nucella emarginata</i>	<i>Tegula funebris</i>	<i>Lottia gigantea</i>
Count	19	23	2
Mean (mm)	17	12	12
Min (mm)	9	8	10
Max (mm)	22	16	14

Zone	Barnacle					Endocladia					Silvetia				
plot #	137	147	148	149	150	386	387	388	389	390	396	397	398	399	400
Lepidochitona spp.							1		1						
Nuttalina spp.									2		1				
Fissurella volcano															
Pachygrapsus					1						1				1
Pagurus spp.															
large limpets(>15mm)									1						
S. purpuratus															
Amphissa versicolor															
Nucella emarginata									2		5				
Acanthina spp.															
Tegula funebris												1	9		
Strongylocentrotus purpuratus															
Leptasterias hexactis															
Lottia gigantea															
Littorina spp.	650	3138	403	1766	1725	288	75	625	180	775	306	76	497	250	231
subsample1	18	52	14	95	36	13	16	10		11	25		45	20	28
subsample2	13	98	106	240	62	3	8	11		19	51		61	39	26
subsample3	21	101	9	230	40	7	0	29		32	22		53	21	20
Limpet < 5 mm	0	11	0	31	3	625	988	363	41	34	31	2	84	406	378
subsample1				8	0	19	33	9		1	1		4	33	19
subsample2				2	1	9	18	11		10	3		20	41	44
subsample3				0	0	22	28	9		0	6		3	56	58
Limpet 5-15 mm	3	47	6	250	72	288	538	475	88	169	172	23	209	284	338
subsample1				45	7	8	18	20		19	12		26	31	29
subsample2				28	12	1	18	12		18	20		11	37	42
subsample3				7	4	14	7	6		17	23		30	23	37

zone	Mytilus					Total Count
plot #	381	382	383	384	385	
Lepidochitona spp.					2	4
Nuttalina spp.		1		4	5	13
Fissurella volcano						0
Pachygrapsus			3	3	3	12
Pagurus spp.						0
large limpets(>15mm)		1	3			5
S. purpuratus						0
Amphissa versicolor						0
Nucella emarginata	1			2	9	19
Acanthina spp.						0
Tegula funebris		3	14			27
Strongylocentrotus purpuratus					2	4
Leptasterias hexactis			1			1
Lottia gigantea				1	1	2
Littorina spp.	124	23	10	1	1	11143
subsample1						
subsample2						
subsample3						
Limpet < 5 mm	57	0	2	194	103	3354
subsample1				3	11	
subsample2				2	6	
subsample3				57	16	
Limpet 5-15 mm	100	21	40	216	288	3625
subsample1				29	20	
subsample2				13	29	
subsample3				27	43	

10 May 2004. Otter Harbor. Low tide -0.5 ft at 1019 hrs. It was another clear but windy and cold day, not making for the best working conditions. The ocean looked very mean today. The beach at the Otter Harbor crook looked to be solid sea lions and seals. We had 14 harbor seals and two elephant seals on the reef. There were 17 elephant seals on the pocket beach and many more on the larger beach to the east. One dead elephant seal was high on the monitoring reef. Two western gull nests with three eggs each were found on the bluff and cove. Two eggs (oystercatcher?) were just on the soil next to the pocket beach. There were six black oystercatchers and one black turnstone at the site. At least 20 western gulls were flying around the area and perching on the bluff behind the site. Several pelagic cormorants were on the adjacent reef point.

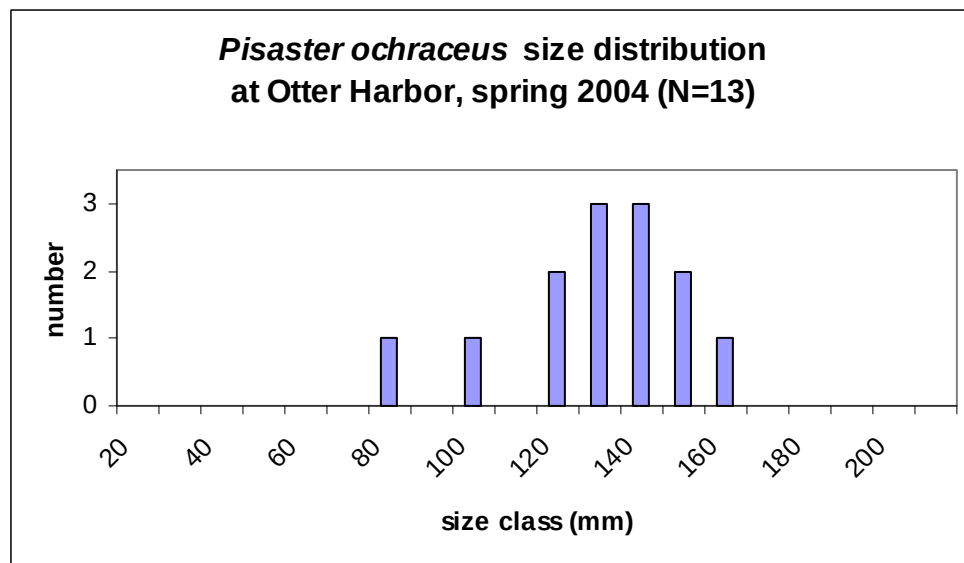
Kelp wrack had blown in from the storm into the channels and was on the lower rocks and blowing over the site. There was a lot of foam on the water and visibility was not very good, it looks like a diatom bloom. I found 48 black abalone in a 30-minute search ranging from 50-143mm. This is down a bit from last fall but the kelp wrack and general conditions may have affected the count. Paula only found 13 *Pisaster ochraceus*, down from counts in the forties in the last few samples. Conditions may have affected the seastar search.

Photoplot summary – mean percent cover by zone at Otter Harbor, San Miguel Island, spring 2004 (5 plots/zone)

ZoneName	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	40.6	37.2	0.0	0.0	0.0	0.0	0.0	4.8	0.0	13.4	0.8	3.2
Endocladia	13.2	6.4	0.2	63.6	3.8	0.4	2.0	0.2	0.4	9.8	0.0	0.0
Rockweed	28.0	18.6	1.0	25.4	3.8	9.2	0.0	0.0	0.2	11.4	1.0	1.4
Mussels	19.0	0.2	0.4	0.0	0.0	0.0	52.6	0.0	4.8	21.4	1.6	0.0

**Seastar counts at Otter Harbor, San Miguel Island, spring 2004
(*Pisaster ochraceus* sizes and colors)**

	brown	orange	purple	total
<75mm	0	0	0	0
75-150mm	10	1	1	12
>150mm	0	0	1	1
Total	10	1	2	13 grand total
Other sp.	<i>Patiria miniata</i> 1	<i>P. giganteus</i> 1		



Black abalone at Otter Harbor, San Miguel Island, spring 2004

Site Code	Count Sized	Mean Size	StDev	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
OH	48	102.42	20.17	50	143	-	91.67%	8.33%	-

Motile invertebrate counts and size frequency measurement at Otter Harbor, San Miguel Island, spring 2004

	<i>Nucella emarginata</i>	<i>Tegula funebris</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
count	37	21	3	53
Mean (mm)	20	16	11	29
Min (mm)	10	6	9	15
Max (mm)	30	26	12	60

zone	Barnacle					Endocladia					Silvetia				
plot #	370	371	372	373	374	360	361	362	363	364	355	356	357	358	359
Lepidochitona spp.								2				1	2		
Nuttalina spp.								2	1	2		1	1		
Fissurella volcano															
Pachygrapsus								2	4	1		3	1		
Pagurus spp.										3					
large limpets(>15mm)										1		13	4	1	
Nucella emarginata						5		1	2	1	1				
Acanthina spp.										1					
Tegula funebris					54	2				4		4		1	
Ocenebra circumtexta					1		9					1			
Lottia gigantea						1		1		1					
Littorina spp.	25	1125	438	431	2	747	22	6		81	39	58	95	404	688
subsample1		30	26	46		74	2								14
subsample2		24	6	72		154	1								15
subsample3		36	3	20		11	4								26
Limpet < 5 mm	0	19	63	1	5	22	72	25		13	7	66	107	15	128
subsample1		1	3			1	8								19
subsample2		2	7			3	13								14
subsample3		3	10			3	2								8
Limpet 5-15 mm	9	300	300	12	3	72	241	74		23	57	43	95	80	138
subsample1		42	42			16	44								12
subsample2		37	37			1	6								21
subsample3		17	17			6	27								11

zone	Mytilus					Total Count
plot #	375	376	378	379	380	
Lepidochitona spp.						5
Nuttalina spp.		4	7	1	5	24
Fissurella volcano						0
Pachygrapsus			2	1	1	15
Pagurus spp.		1				4
Large limpets(>15mm)	1	3	2	4		29
Nucella emarginata	3	2	2	5	15	35
Acanthina spp.						1
Tegula funebris						65
Ocenebra circumtexta						12
Lottia gigantea	10	13	8	10	13	56
Littorina spp.	4	0	0	0	0	4164

subsample1						
subsample2						
subsample3						
Limpet < 5 mm	16	24	24	39	63	708
subsample1					4	
subsample2					7	
subsample3					9	
Limpet 5-15 mm	149	75	113	192	219	2194
subsample1					24	
subsample2					28	
subsample3					18	

I stopped again on the way back to pull more weeds along the trail between the caliche forest and the weather station. I found one really dense patch of Tocolote thistles on top of the hill containing mostly young plants.

Anacapa Island June 7, 2004

(Database event #2004-E)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Paula Rich, Biological Technician, Channel Islands National Park

PROCEDURE and general observations: We departed Ventura at 0900 on the Pacific Ranger on the first day of the kelp forest monitoring cruise, stopping at Anacapa on the way to Santa Barbara Island. We skiffed ashore at Frenchy's Cove about 2.5 hours after the low tide but we were able to shoot photos of all the photoplots following standard protocol with the Olympus digital camera. Cover was scored from the digital images later, in the office. Shorebirds and mammals were counted upon arrival. Overview photos of the site were taken. Relative abundance of target organisms was noted.

The other Anacapa sites were not monitored in spring of 2004, mostly due to logistical problems. Anacapa monitoring was scheduled for June but transportation problems developed and getting to the island became very difficult. Morning tides and weekends are difficult to work and the early kelp forest cruise did not leave room for flexibility.

7 June 2004. South Frenchy's Cove. Low tide -0.8 ft at 0831 hrs. Winds were light but the swell was moderate from the south. We were on site from 1115-1200 hrs. There were three black oystercatchers in the area and no pinnipeds.

Plot 364 was the only one that was difficult to locate because three corners were overgrown by mussels. California mussels were abundant and seemed to be having very high recruitment. Both rockweed species, *Hesperophycus californianus* and *Silvetia compressa* were doing very well. No timed search was made, but no seastars were noticed on the reef. Owl limpet and motile invertebrate counts were not conducted because of the incoming tide. *Enteromorpha* sp. was noted growing on *Sargassum muticum*. *Chaetomorpha lineum* was doing well in the pool near plot 250. A few corners need repair but plots were mostly fine.

Photoplot summary – mean percent cover by zone at South Frenchy's Cove, Anacapa Island, spring 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Other
Barnacle	35.8	33.0	0.0	28.6	2.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Endocladia	17.4	4.2	0.0	62.6	1.4	13.0	0.0	0.0	0.0	0.0	0.0	1.4
Rockweed	17.4	4.6	0.0	5.0	0.4	69.8	0.0	0.0	0.0	2.8	0.0	0.0
Mussels	2.2	0.8	0.0	0.6	0.0	0.0	92.6	1.2	0.2	1.8	0.0	0.6

Fall 2004 Rocky Intertidal Trip Reports

Santa Barbara Island November 9-15, 2004

(Database event #2004-F)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Sarah Chaney, Ecologist, Channel Islands National Park
Santiago Arredondo, SCA Intern
Ann Fossum, SCA Intern

PROCEDURE and general observations: travel to SBI on the Sea Ranger. Typically, we did vegetation work in the morning then tidepools in the afternoon. Intertidal monitoring was done in standard fashion following the monitoring handbook to photograph plots with the digital camera (Olympus 5050). Motile invertebrates were counted in photoplots by searching the entire plot. Limpets and *Littorina* were counted in three 20 x 20 subplots. Seastars were counted during thirty-minute searches. There was about 0.1 inches of rain last weekend and nearly 2.5 inches in the last month. The island was very green with the grass about 6 inches tall and giant coreopsis leaves several inches long. Boxthorn and sagebrush were all leafed out. Goldfields and fiddlenecks were about one to two inches tall and carpet some hillsides. Crystalline iceplant and cheese weed seedlings were abundant. Several juvenile island night lizards were seen. Bird list appears at end of this report.

Results:

10 November 2004, Landing Cove. Low tide 0.0 ft at 1349 hrs, excellent conditions with very little swell, no wind, and clear sky. We were on site from 1200-1630 hrs. There were about 60 California sea lions in the Landing Cove area, though only four or five were on the rocks by the plots. Two black Oystercatchers, two Black Turnstones and one Wandering Tattler were present in the cove.

We located and marked the *Dudleya* monitoring plots at Cat Canyon this morning. Sarah and Ann stayed to do the monitoring while Santiago and I went back to do the intertidal monitoring.

We photographed all the intertidal plots, easily locating them all. I counted motile invertebrates in the barnacle, rockweed, and mussel plots. Since the turf plots are only at this island and few invertebrates are found in them I did not count motile invertebrates in them. *Mytilus californianus* cover was very high. Most individuals ranged from 5 to 50 mm and the bed was about 10 cm deep. All the bolts of 327 were obscured by mussels. Most of plot 326 was bare of mussels with *Egregia menziesii* and other algae growing there. The left side bolts were exposed and the right side was hidden by mussels, opposite of last year.

Endarachne binghamae was common in barnacle plots. *Phyllospadix* sp. dominated turf zone plots 322 and 323. The mixed red algal turf was dominant in the other turf plots consisting mostly of *Chondracanthus canaliculatus*, *Mazzaella affinis*, and *Pterocladia* sp. *Gelidium coulteri* was also fairly common. Three small *Pisaster ochraceus* (20 to 25 mm) were found in mussel plots, deep among the mussels. *Ocenebra circumtexta* were in most plots and all were small (around 10 mm). *Phragmatopoma californica* was fairly common under the mussels in

mussel plots and among the mussels in the rockweed plots and turf plots. All of the *P. californica* colonies were small and low profile.

The temperature logger was downloaded successfully about 1640 hrs.

Photoplot summary – mean percent cover by zone at Landing Cove, Santa Barbara Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	37.6	7.2	10.6	2.8	0.0	0.0	8.4	4.8	0.0	28.0	0.6	0.0
Rockweed	20.8	3.0	0.2	0.0	0.0	2.0	2.2	15.2	0.0	56.4	0.2	0.0
Mussels	4.0	0.0	4.0	0.0	0.0	0.0	49.4	0.6	0.8	38.4	2.8	0.0
Red Algal Turf	0.2	0.0	0.0	0.0	0.0	0.0	1.8	49.0	0.0	18.2	0.4	0.0

11 November 2004, Sea Lion Rookery. Low tide -0.6 at 1425 hrs. Excellent conditions with light wind and calm seas. There were about 150 California sealions in the area with about 50 to 60 lying on the rocks at the site. There were numerous Western Gulls on the mussel beds and two Black Oystercatchers and eight Black Turnstones were working the area. All of us went down to the site after monitoring *Dudleya traskei* plots in Cave Canyon this morning. We were on site from 1200-1715 hrs.

Sarah photographed the photoplots while I started counting motile invertebrates. All the plots were easily found, though the mussel bed was very deep and some bolts were buried or difficult to see. Sarah and Ann counted seastars, finding 109, mostly small (<75mm) or medium (75-150mm) sizes. Very few motile invertebrates were found in the barnacle or Endocladia zone plots. *Littorina* spp. were rare except in a few small areas with many micro-fissures in the rock. *Pachygrapsus crassipes* were uncommon in these two zones and chitons were uncommon. The few *Acanthina* sp., *Tegula funebris*, and *Ocenebra circumtexta* were all small. *O. circumtexta* and *Ceratostoma nuttalli* were the most common snails in the mussel plots. The mussel plots were difficult to search because of the dense small mussels. *Pagurus samuelis* were common in the rockweed plots.

Ulva sp. dominated the Endocladia and barnacle zone plot cover. Barnacles were uncommon with *Chthamalus/Balanus* covering only 4 to 10% of the plots, usually on the near vertical surfaces. *Mazzaella affinis* and *Endocladia muricata* were present in all of the Endocladia zone plots, though were mostly very low cover except on vertical surfaces. *Silvetia compressa* was dominant in all Silvetia zone plots except plot 330 which is a low rock among the mussel bed and is dominated by mussels and *Tetraclita rubescens*. *Mytilus californianus* cover in the mussel zone was nearly complete except for some *Pollicipes polymerus* in plot 354.

12 November 2004, Sea Lion Rookery. Low tide -0.9 ft at 1512 hrs. Excellent conditions again with light wind and seas. We shot vegetation photopoints around the island this morning. I worked alone at the site while the others went off to monitor *Dudleya* plots at Cat Canyon. There were 50 sea lions on the rocks at the site when I arrived. Three Black Oystercatchers and two Black Turnstones were in the area. About 100 Western Gulls were present on the outer mussel

beds. Most were just milling around some were picking at things among the mussels. I was at the site from 1330-1630 hrs.

I searched for at least 30-minutes for general species notes and added any new observations while doing measurements. I measured *Pisaster ochraceus* on the reef near the mussel plots and in towards the north covering much of the same ground as Sarah and Ann yesterday. There were many small *P. ochraceus* visible in small openings in the mussel bed. Typically they were clustered with several in each opening. No seastars were found on the south half of the site. I measured 60 in a 30-minute search. The sizes (radius) ranged from 35-170 mm. Orange color was noted and all eight bright orange stars that I found were 115 mm or larger. I noticed that all the stars less than 45mm were a grey-green color.

Lottia gigantea were common along the middle part of the reef slope. I measured over 100 for a general size distribution for the site. Plots might be possible to establish here but most limpets are spread out among the low boulders. The sizes ranged from 17 to 74 mm. The mean size (41mm) is essentially the same as we found in 1997 (40mm).

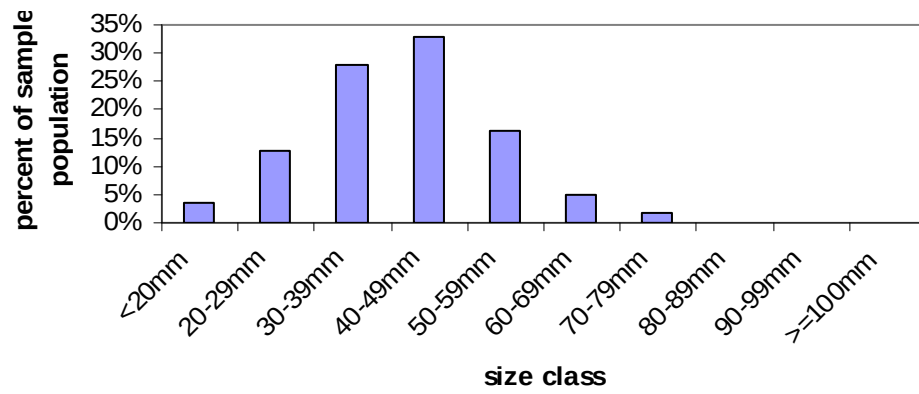
Photoplot summary – mean percent cover by zone at Se Lion Rookery, Santa Barbara Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	39.2	7.0	1.2	1.4	0.0	0.0	0.8	0.4	0.2	49.8	0.0	0.0
Endocladia	27.6	0.6	7.0	9.0	0.0	0.0	2.6	0.6	0.6	51.8	0.2	0.0
Rockweed	17.6	0.0	3.6	1.6	0.0	43.0	11.0	6.8	0.8	15.2	0.4	0.0
Mussels	0.0	0.0	0.2	0.0	0.0	0.0	98.0	0.0	1.8	0.0	0.0	0.0

***Lottia gigantea* size distribution at Sea Lion Rookery, Santa Barbara Island, fall 2004**

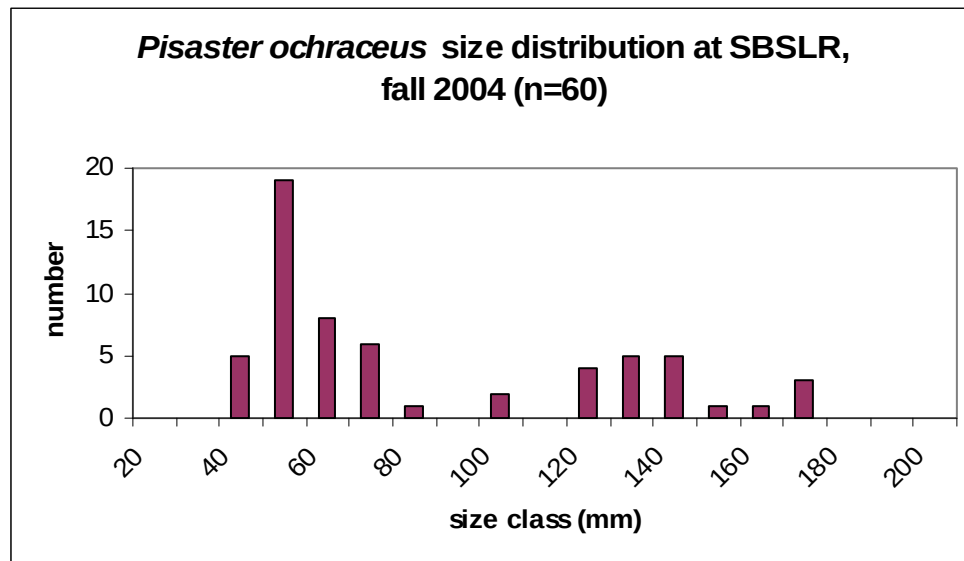
Count	Mean	StDev	Min	Max	%<	%20-	%30-	%40-	%50-	%60-	%70-	%80-	%90-	%>=
Sized	Size		Size	Size	20mm	29mm	39mm	49mm	59mm	69mm	79mm	89mm	99mm	100mm
118	41.04	12.09	17	74	3.39%	12.71%	27.97%	33.05%	16.10%	5.08%	1.69%	0.00%	0.00%	0.00%

***Lottia gigantea* at Sea Lion Rookery, Santa
Barbara Island (n=118)**



***Pisaster ochraceus* counts at Sea Lion Rookery, Santa Barbara Island, fall 2004**

	<i>orange</i>	<i>brown/purple</i>	<i>Total</i>
<75mm	1	37	38
75-150mm	13	30	43
>150mm	14	14	28
Total	28	81	109



Motile invertebrate counts and size frequency measurements at Sea Lion Rookery, Santa Barbara Island, fall 2004

	<i>Acanthina spp.</i>	<i>Tegula funebris</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
Count	7	2	30	8
Mean size (mm)	12	10	12	25
Min size (mm)	9	9	6	12
Max size (mm)	14	10	26	44

<i>SBSLR fall 2004</i>		<i>counts</i>									
<i>Zone</i>		<i>Endocladia</i>					<i>Silvetia</i>				
<i>plot #</i>		<i>335</i>	<i>336</i>	<i>337</i>	<i>338</i>	<i>339</i>	<i>330</i>	<i>331</i>	<i>332</i>	<i>333</i>	<i>334</i>
Lepidochitona spp.				1			5	5	2	1	7
Nuttalina spp.	1			4			4	2	1	2	
Fissurella volcano				1						2	5
Pachygrapsus							8	1	3	3	4
Pagurus spp.			1				7	57	108	64	22
large limpets(>15mm)			1	2			13	11	4	1	6
<i>S. purpuratus</i>											
<i>Amphissa versicolor</i>											
<i>Nucella emarginata</i>											
<i>Acanthina</i> spp.			1				1	1	1	1	
<i>Tegula funebris</i>											
<i>Ceratostoma nuttali</i>									1		
<i>Ocenebra circumtexta</i>				1			8	4			4

Lottia gigantea						1	2		2	
Pisaster ochraceus										
Littorina spp.	0	2	1	2	6	0	0	0	0	0
subsample 1						0				
subsample 2						0				
subsample 3						0				
Limpet < 5 mm	0	1	0	0	0	0	0	0	0	0
subsample 1						0				
subsample 2						0				
subsample 3						0				
Limpet 5-15 mm	9	6	14	15	16	84	35	21	22	28
subsample 1						8				
subsample 2						14				
subsample 3						5				

SBSLR fall 2004											
Zone	Barnacle					Mytilus					
plot #	345	346	347	348	349	350	351	352	353	354	Total
Lepidochitona spp.											21
Nuttalina spp.											14
Fissurella volcano						1		2	1	1	13
Pachygrapsus			3			3	1		1		27
Pagurus spp.											259
large limpets(>15mm)				1							39
S. purpuratus											0
Amphissa versicolor											0
Nucella emarginata											0
Acanthina spp.		1		1							7
Tegula funebris			2								2
Ceratostoma nuttali						3		1	3	1	9
Ocenebra circumtexta											17
Lottia gigantea											5
Pisaster ochraceus									1		1
Littorina spp.	81	231	122	6	13	0	0	0	0	0	464
subsample 1	10	44	6	0	0	0	0	0	0	0	
subsample 2	16	15	4	2	0	0	0	0	0	0	
subsample 3	0	15	29	0	4	0	0	0	0	0	
Limpet < 5 mm	0	0	0	0	0	0	0	0	0	0	1
subsample 1	0	0	0	0	0	0	0	0	0	0	
subsample 2	0	0	0	0	0	0	0	0	0	0	
subsample 3	0	0	0	0	0	0	0	0	0	0	
Limpet 5-15 mm	0	0	3	9	0	144	228	197	97	213	1141
subsample 1	0	0	1	0	0	18	28	20	10	12	
subsample 2	0	0	0	1	0	17	26	19	9	25	
subsample 3	0	0	0	2	0	11	19	24	12	31	

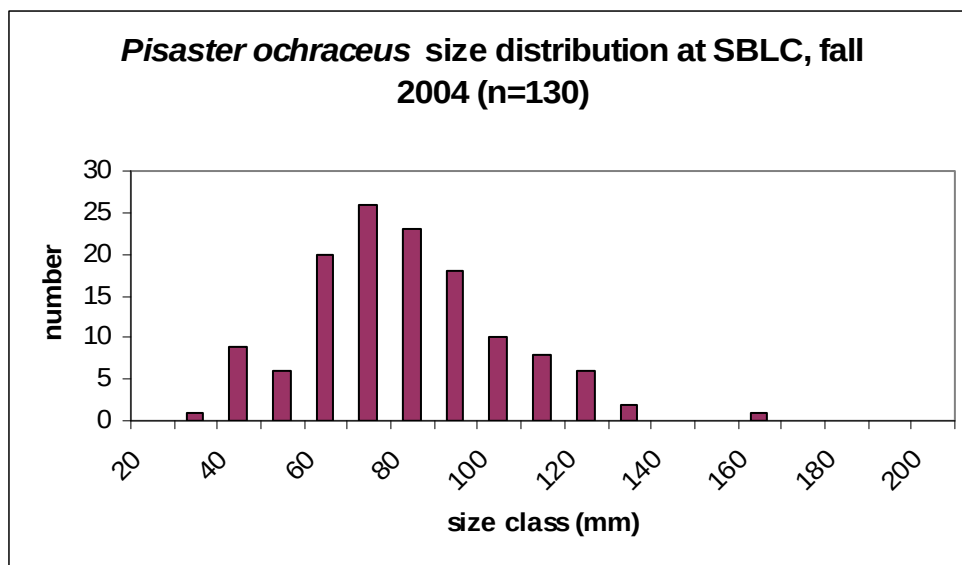
13 November 2004, Landing Cove. Low tide -1.0 at 1559 hrs. Excellent conditions with light surge and wind under mostly clear sky. I worked on notes and trip report in the morning before

going back to Landing Cove. Two Black Oystercatchers, one Wandering Tattler and six Western Gulls were present. I worked the entire time on the south section.

I scored all of the barnacle and mussel plots, repaired corners on the barnacle plots, removed the extra corner at 329, and measured seastars. There were 130 *Pisaster ochraceus* on the south reef. The 18x2m transect had only 14 *P. ochraceus* total. Sizes ranged from 30 to 157mm. One black abalone (66 mm) was found. *Strongylocentrotus purpuratus* were common in the tidepools. I did a general search for species list. Diversity seemed higher than at SBSLR but nothing exceptional was found.

***Pisaster ochraceus* at Landing Cove, Santa Barbara Island, fall 2004**

<i>SBLC</i>	<i>orange</i>	<i>brown/purple</i>	<i>Total</i>
<75mm	4	66	70
75-150mm	9	50	59
>150mm	0	1	1
Total	13	117	130



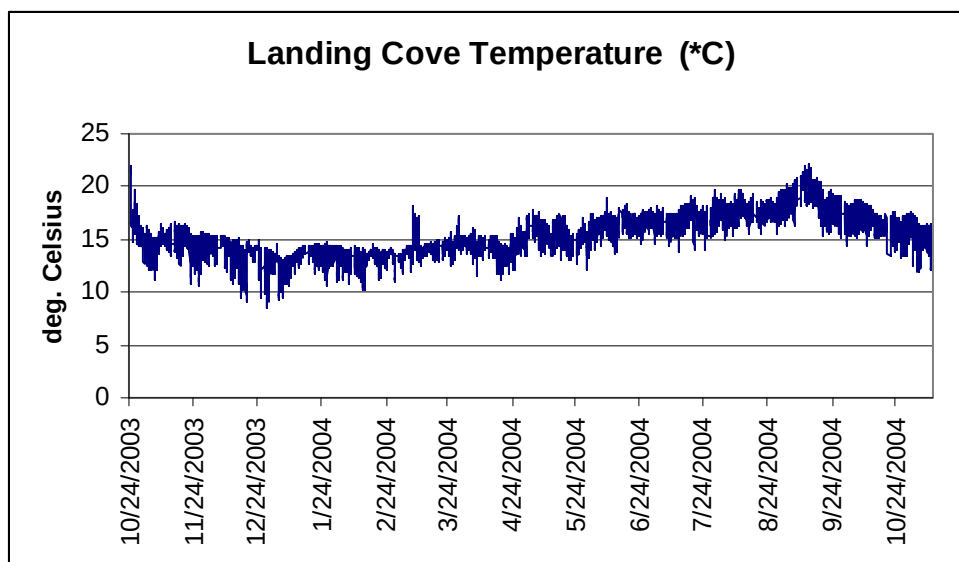
***Pisaster ochraceus* size range comparison at both sites, Santa Barbara Island, fall 2004**

	<i>SBLC</i>	<i>SBSLR</i>
Count measured	130	60
Mean size (mm)	75	80
Min size (mm)	30	35
Max size (mm)	157	170

**Motile invertebrate counts and size frequency measurements at Landing Cove,
Santa Barbara Island, fall 2004**

	<i>Ceratosoma nuttali</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
Count	6	75	4
Mean size (mm)	14	11	14
Min size (mm)	8	5	13
Max size (mm)	25	15	14

SBLC fall 2004																
Zone	<i>Silvetia</i>					<i>Barnacle</i>					<i>Mytilus</i>					
plot #	310	311	312	313	314	315	316	317	318	319	325	326	327	328	329	total
Lepidochitona spp.	1			2		1		3	1		1				1	10
Nuttalina spp.		1		2	1	1		5	24	2	5	3		6	5	55
Fissurella volcano					1							5		1	1	8
Pachygrapsus	3	1	1					1	1		3	1		3		14
Pagurus spp.																0
large limpets(>15mm)	1															1
S. purpuratus												24	3	2	8	37
Amphissa versicolor												1			2	3
Nucella emarginata																0
Acanthina spp.												1				1
Tegula funebris																0
Ceratosoma nuttali												1	2		3	6
Ocenebra circumtexta	8	3	1	6	3	1	2	8	9	1	16	5	7	3	5	78
Lottia gigantea											4					4
Pisaster ochraceus														2	1	3
Littorina spp.	0	3	3	0	0	6	0	0	3	0	0	0	0	0	0	16
subsample 1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	
subsample 2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
subsample 3	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	
Limpet < 5 mm	0	3	3	0	0	0	6	0	6	0	6	9	9	3	3	50
subsample 1	0	0	0	0	0	0	0	0	1	0	0	3	1	0	0	
subsample 2	0	1	1	0	0	0	0	0	1	0	2	0	2	0	0	
subsample 3	0	0	0	0	0	0	2	0	0	0	0	0	0	1	1	
Limpet 5-15 mm	97	38	53	31	153	50	47	100	153	44	203	25	22	44	47	1106
subsample 1	6	2	4	4	17	5	4	2	20	4	27	7	3	5	2	
subsample 2	9	2	4	2	18	5	5	15	12	7	22	1	1	2	6	
subsample 3	16	8	9	4	14	6	6	15	17	3	16	0	3	7	7	



14 November 2004. Low tide -1.0 at 1652. Significant swell hitting the island today but the weather was beautiful with light winds from the northeast. I helped Sarah with *Dudleya* plots at Arch Point and Middle Canyon before going back to both sites to reshoot a couple plots that did not come out well the first time. We found some giant coreopsis plants that were nine feet tall near the mouth of Middle Canyon. We also found some nice *Dudleya traskiae* including a number of new seedlings.

Re-shot plots 347 and 345 at Sea Lion Rookery. Four Black Turnstones and two Black Oystercatchers were seen in the area, and approximately 50-60 sea lions were on the site. Most of the site was still under water at 1500 hrs. At Landing Cove, I re-shot plots 322 and 323. Swells were rolling over the site at 1600 hrs. Two black oystercatchers and one wandering tattler were seen. Less than a dozen sea lions were on the Landing Cove reef this afternoon.

15 November 2004. We set out to check *Dudleya* on Signal Peak slope, but decided that it would be better to wait for assistance and rope in for safety. We took photos of badlands restoration area and scraped thousands of iceplant seedlings from the trails.

16 November 2004. Return to Ventura

Santa Barbara Island Bird list for the entire week

Western Brown Pelican	Peregrine Falcon	White Crowned Sparrow
Double-crested Cormorant	Barn Owl	Spotted Towhee
Pelagic Cormorant	Burrowing Owl	Chipping Sparrow
Western Gull	Flammulated Owl (?)	American Kestrel
Royal Tern	Belted Kingfisher	Hermit Thrush (?)
Black Oystercatcher	Say's Phoebe	Merlin
Black Turnstone	Black Phoebe	Orange Crowned Warbler (?)
Wandering Tattler	Horned Lark	Rock Wren
Northern Harrier		

(?)=ID unsure

Santa Cruz Island November 11-15, 2004

(Database event #2004-G)

PERSONNEL: Paula Rich, Biological Technician, Channel Islands National Park
Jacob Osbourne, PISCO

PROCEDURE and general observations: We took the Island Packer vessel *Island Adventure* to Santa Cruz Island, arriving at Prisoners at approximately 1300 hrs. Standard procedures were used for monitoring the rocky intertidal sites. All plots and site overviews were photographed with an Olympus Camedia 5050 digital camera. Surfgrass transects were read at Trailer and Fraser Cove. Seastars were counted and measured at all sites. The maximum number of shorebirds and pinnipeds seen at any one time was recorded. Due to time constraints imposed by the late tides and early darkness, abalone searches were not conducted and no plot repairs were done.

11 November 2004, Prisoners Harbor. Low tide -0.5 ft at 1451 hrs. Overcast sky and cool, calm conditions. There were no shorebirds or pinnipeds present in the area. We were onsite from 1345 -1715 hrs.

Photos were taken of all the plots and all except the *Endocladia* plots were field scored. No shade was used for the photos because of the heavily overcast conditions. Pans from reference bolts 1-3 and some additional area photos were also taken.

Mussel recruitment is still high, with the *Mytilus* plots now ranging from 53 to 87% *Mytilus* cover. No bleached algae were present; some of the algae and surfgrass at the site were bleached last spring. Most of the *Silvetia compressa* was long and healthy. The small amount of *Hesperophycus californica* present was short. *Scytosiphon* and *Endarachne* were common in the barnacle and *Silvetia* plots. The *Hesperophycus* and *Endocladia* plots were mostly bare rock.

Jacob counted and measured seastars, finding 8 orange and 46 brown/purple for a total of 54 at the site. The stars at this site were larger than at other sites, with 21 of the 50 measured being over 140mm. No effort was made to search for abalone.

Some plot repairs were noted on the photo log, but there was not enough time to make them.

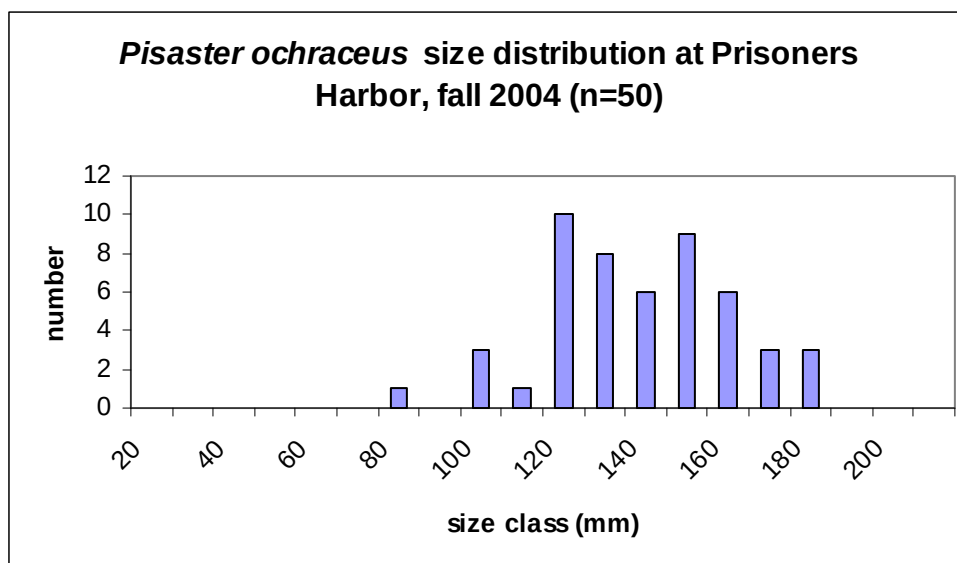
It was already getting quite dark at 1715, so we left the site and drove to the UC field station for the night.

Photoplot summary – mean percent cover by zone at Prisoners Harbor, Santa Cruz Island, fall 2004 (5 plots/zone)

Zone Name	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc. Algae	Misc. Animal	Tar	Other
Barnacle	33.8	20.6	0.0	3.4	0.4	0.0	1.4	0.4	0.0	40.0	0.0	0.0	0.0
Endocladia	37.8	25.6	0.2	21.4	5.8	0.0	4.8	0.0	0.0	4.0	0.0	0.0	0.4
Rockweed	47.4	1.4	1.4	0.0	0.0	12.8	1.6	0.0	0.0	31.6	3.8	0.0	0.0
Mussels	4.6	6.8	2.6	0.0	0.0	0.0	69.8	0.4	0.0	14.8	1.0	0.0	0.0
Hesperophycus	66.8	18.4	0.0	7.4	3.2	0.2	0.0	0.0	0.0	1.6	2.4	0.0	0.0

**Seastar (*Pisaster ochraceus*) measurements at Prisoners Harbor, Santa Cruz Island, fall 2004
(total count =54)**

<i>total</i>	50	<i>radius</i>	<i>brown/purple</i>	<i>orange</i>
Min size (mm)	74	<75mm	0	1
Max size (mm)	176	75-150mm	32	5
Mean size (mm)	133.58	>150mm	10	2
(four additional brown/purple stars found, not measured, not included above)				



12 November 2004, Fraser Cove. Low tide -0.8 ft at 1534 hrs. It was mostly sunny and cool, and the wind was about 15 knots from the northwest. The swell was relatively low, however, with waves about 3 to 4 feet. Five black oystercatchers and one willet were seen. We were on site from 1300-1700 hrs.

Photos were taken of all the photoplots, limpet plots, surfgrass transects, and panoramas from reference bolts 1-4. The limpet plots and surfgrass transects 2 and 3 were scored. I could not locate the G1 bolt, but took a photo of the general area. Jacob changed the PISCO tuffies and plates and counted and measured seastars. 37 brown/purple and 14 orange stars were found for a total of 51. One *Patiria miniata* was also observed. No effort was made to search for abalone. Overall, the mussel population and algae looked healthy.

Lottia counts ranged from only one found in plot 2 to 13 found in plot 1. Sizes ranged from 30mm to 81mm.

Surfgrass was bleached in low amounts, approximately 15%, and there was a moderate amount of epiphytic *Melobesia mediocris*. Transect 1 was not read as we were unable to find the marker bolts.

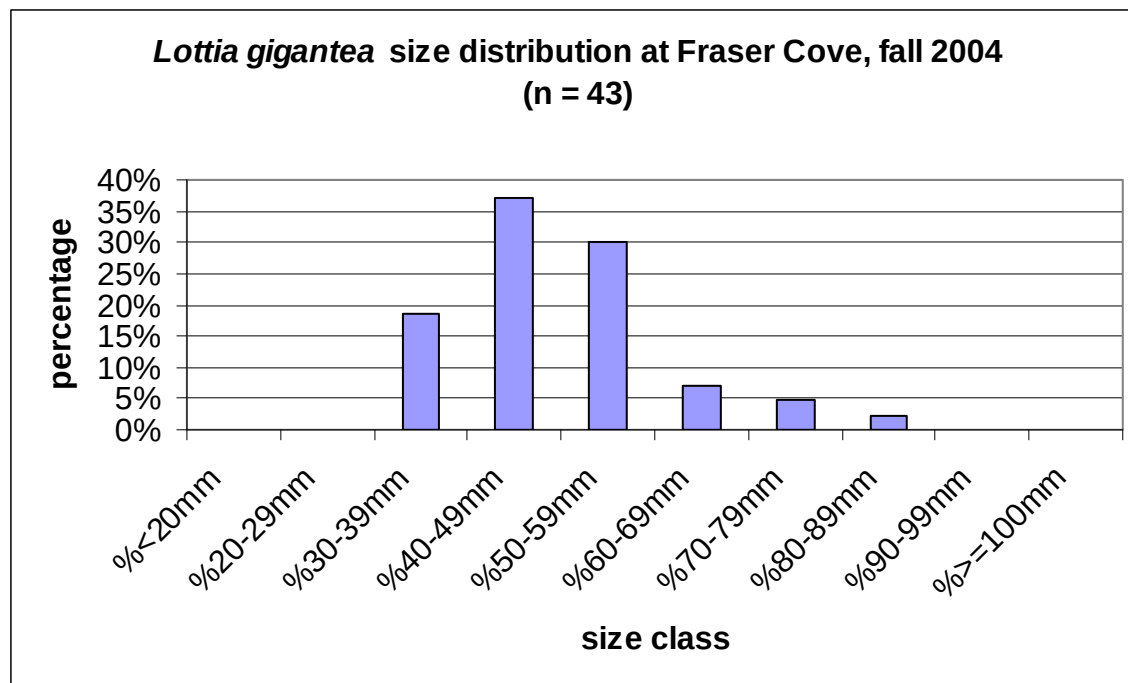
We were limited by daylight. We camped at the Trailer location.

**Photoplot summary – mean percent cover by zone at Fraser Cove, Santa Cruz,
fall 2004 (5 plots/zone)**

Zone Name	Bare Rock	Barnacle	Tetra- clita	Endo- cladia	Hespero- phycus	Silvetia	Mussels	Turf- weed	Leaf Barnacle	Misc. Algae	Misc. Animal	Tar	Other
Barnacle	30.6	40.0	0.0	9.8	0.0	0.0	0.8	0.0	0.0	17.4	0.0	1.2	0.2
Endocladia	14.6	8.4	0.0	57.0	2.0	0.0	2.0	0.0	0.0	15.8	0.0	0.0	0.2
Rockweed	17.0	1.8	0.0	6.2	9.4	64.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
Mussels	8.8	0.6	0.0	0.4	0.0	0.0	79.2	0.0	0.4	2.8	7.2	0.0	0.6
Pollicipes	10.2	6.4	2.0	5.4	0.0	0.0	50.2	1.4	7.6	8.2	7.0	0.2	1.4
Tar	32.8	17.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	50.0	0.0
Hesperophycus	38.6	3.6	0.0	22.0	26.8	6.4	0.0	0.0	0.0	2.4	0.0	0.0	0.2

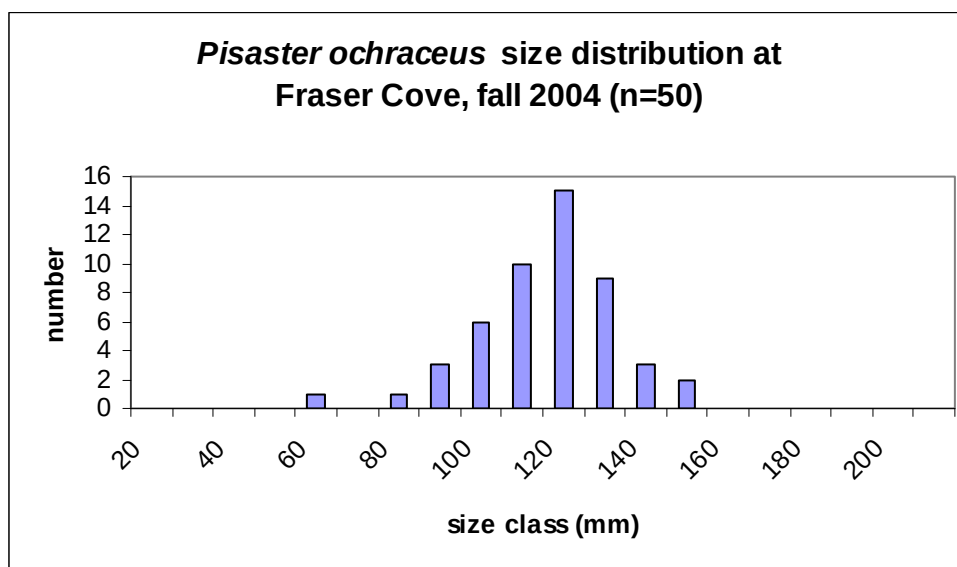
***Lottia gigantea* at Fraser Cove, Santa Cruz Island, fall 2004:**

Plot	Count	Density	Mean Size	St. Dev.	Min Size	Max Size
1	13	4.139	54.00	13.11	32	77
2	1	.318	49.00		49	49
3	7	2.229	53.57	15.20	30	81
4	11	3.502	40.91	6.04	32	50
5	11	3.502	48.64	7.65	36	60



Seastar (*Pisaster ochraceus*) counts at Fraser Cove, Santa Cruz Island, fall 2004

<i>total</i>	<i>50</i>	<i>radius</i>	<i>brown/purple</i>	<i>orange</i>
Min size (mm)	59	<75mm	1	0
Max size (mm)	146	75-150mm	35	14
Mean size (mm)	111.2	>150mm	0	0
Other species: <i>Patiria miniata</i> (1)				
(one additional brown/purple <i>P. ochraceus</i> found, not measured, not included above)				



Surfgrass transects at Fraser Cove, Santa Cruz Island, fall 2004

(additional taxa removed when not represented)

Location: <i>Fraser Cove</i> Site Code: <i>SCFC</i>			
Date: <i>12-Nov-04</i> recorder: <i>Paula Rich</i>			
<u>Taxa</u>	<u>Transect 1</u>	<u>Transect 2</u>	<u>Transect 3</u>
Erect coralline		3	9
other red algae		21	11
Phyllospadix sp. overstory		70	75
Anthopleura spp.		3	1
Phragmatopoma californica		3	4
total	Not	100	100
	sampld		

13 November 2004, Trailer and Forney's Cove. Low tide -1.0 ft at 1621 hrs. The weather was sunny, no wind, but with a moderate swell. There were two Black Oystercatchers and three California Sea Lions at the Trailer site. We were onsite from 1215-1530 hrs.

Photos were taken of all the photoplots, limpet plots, surfgrass transects, and pans from reference bolts 1 and 2. The limpet plots and surfgrass transects were scored. Jacob changed the PISCO tuffies and plates and counted and measured seastars. A total of 77 seastars were found, 61 brown/purple and 16 orange. No effort was made to search for abalone.

Lottia counts ranged from only 1 found in plot 3 and 5 to 23 found in plot 2. Sizes ranged from 28mm to 92mm. Barnacles and red algae have been encroaching upon plots 3 and 5, and some *Phragmatopoma* is present in plot 3 as well.

Silvetia compressa was abundant and doing very well. *Hesperophycus californica* was uncommon but appeared healthy. *Endocladia muricata* was common. *Chthamalus/Balanus* barnacles were abundant. *Tegula* and *Littorina* were noticeably abundant, even though we did not count motiles this trip. *Ligia* were abundant on the rocks at the entrance to the site.

In general the surfgrass looked very healthy, with low amounts of bleaching and abrasion. *Smithora* cover was moderate.

We left the site at 1530 in order to make it over to Forney's to take photos before dark. We arrived at Forney's about 1600 and took photos of the 10 photoplots there and a pan from the reference bolt. I also made quick sketches of the plots to aid in scoring later.

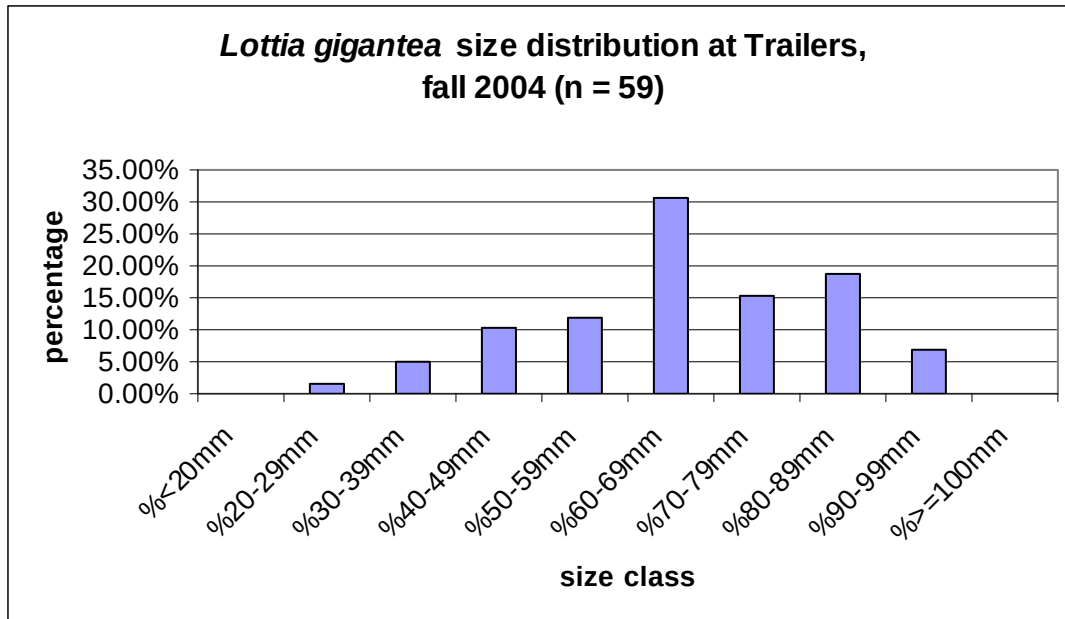
We camped at Trailer again that night.

Photoplot summary – mean percent cover by zone at Trailer, Santa Cruz Island, fall 2004 (5 plots/zone).

Zone Name	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc. Algae	Misc. Animal	Tar	Other
Barnacle	42.0	53.8	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.4	1.0	0.0	0.0
Rockweed	10.4	0.4	0.0	0.8	0.0	86.4	0.0	0.0	0.0	1.6	0.0	0.0	0.4
Mussels	11.0	4.6	0.2	0.2	0.0	0.0	60.4	1.4	0.0	18.6	2.6	0.0	1.0
Hesperophycus	41.4	3.8	0.0	15.2	7.6	31.0	0.0	0.2	0.0	0.8	0.0	0.0	0.0

***Lottia gigantea* at Trailer, Santa Cruz Island, fall 2004:**

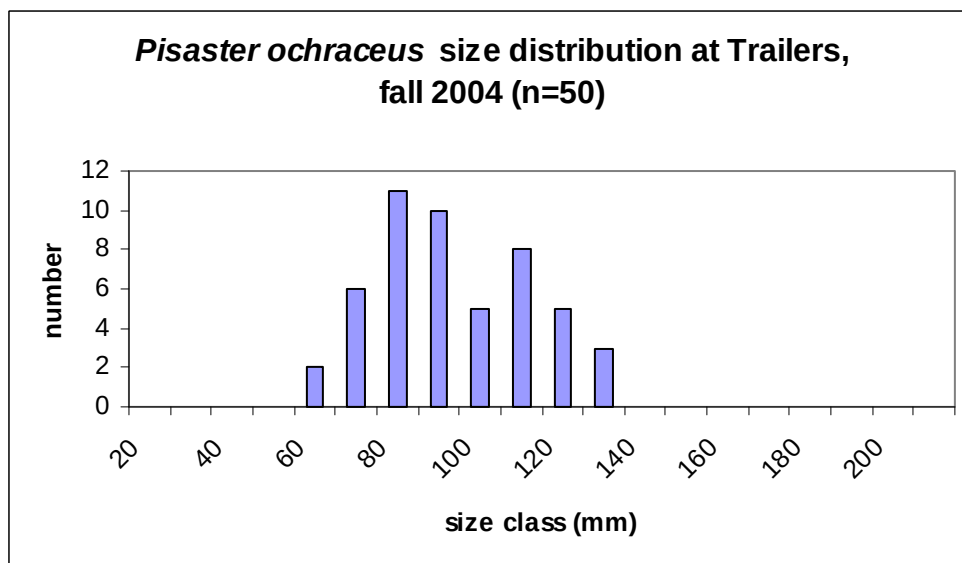
Plot	Count	Density	Mean Size	St. Dev.	Min Size	Max Size
1	21	6.686	78.29	12.72	39	96
2	23	7.323	60.91	15.64	28	92
3	1	.318	34.00		34	34
4	13	4.139	61.69	6.76	49	69
5	1	.318	46.00		46	46



Seastar (*Pisaster ochraceus*) counts at Trailer, Santa Cruz Island, fall 2004:

<i>total</i>	<i>50</i>	<i>radius</i>	<i>brown/purple</i>	<i>orange</i>
Min size (mm)	58	<75mm	13	2
Max size (mm)	130	75-150mm	26	9
Mean size (mm)	88.8	>150mm	0	0

(22 additional brown/purple and 5 orange stars found, not measured, not included above)



Surfgrass transects at Trailer, fall 2004

(additional taxa removed when not represented)

Location: Trailer**Site Code:** SCTR**Date:** 13-Nov-04**Recorders:** Paula Rich

<u>Taxa</u>	<u>Transect 1</u>	<u>Transect 2</u>	<u>Transect 3</u>
Rock		1	1
Egregia menziesii	2	1	1
Erect coralline	3	4	7
other red algae	12	14	28
Phyllospadix sp. overstory	83	73	62
Phyllospadix sp. understory	4	4	1
Mytilus californianus		1	
Phragmatopoma californica	0	3	1
Chthamalus/Balanus		1	
Other green algae		2	
total	104	104	101

14 November 2004, Willows Anchorage. Low tide -1.0 ft at 1714 hrs. The weather was sunny, clear, and warm. The swell was low and wind calm. Two Western Gulls were at the site. We were on site from 1315-1700 hrs.

Photos were taken of the photoplots, limpet plots, and pans were taken from reference bolts 1-3. Because the mussels were very dense, almost none of the mussel plot bolts were found. I estimated the placement of the quadrat for M2 through M5 by looking at photos which were taken last spring. I was not able to reliably place M1 so I did not photograph the plot, but did take photos of the area. Limpet plots 1 through 4 were scored, but I was unable to locate L5 even though the archival photo made it clear where it should be. Instead I photographed the L5 area. I also made sketches of all the photoplots except M1 through M5, which will help in scoring them later.

Lottia plots 1 through 4 have extensive *Mytilus* encroachment, and the L5 area is largely algae. Counts for L1 through 4 ranged from 9 limpets in plot 1 to 15 in plot 2, and sizes ranged from 16mm to 64mm.

Jacob counted and measured seastars. A total of 379 seastars were found, 271 brown/purple and 108 orange. No effort was made to search for abalone.

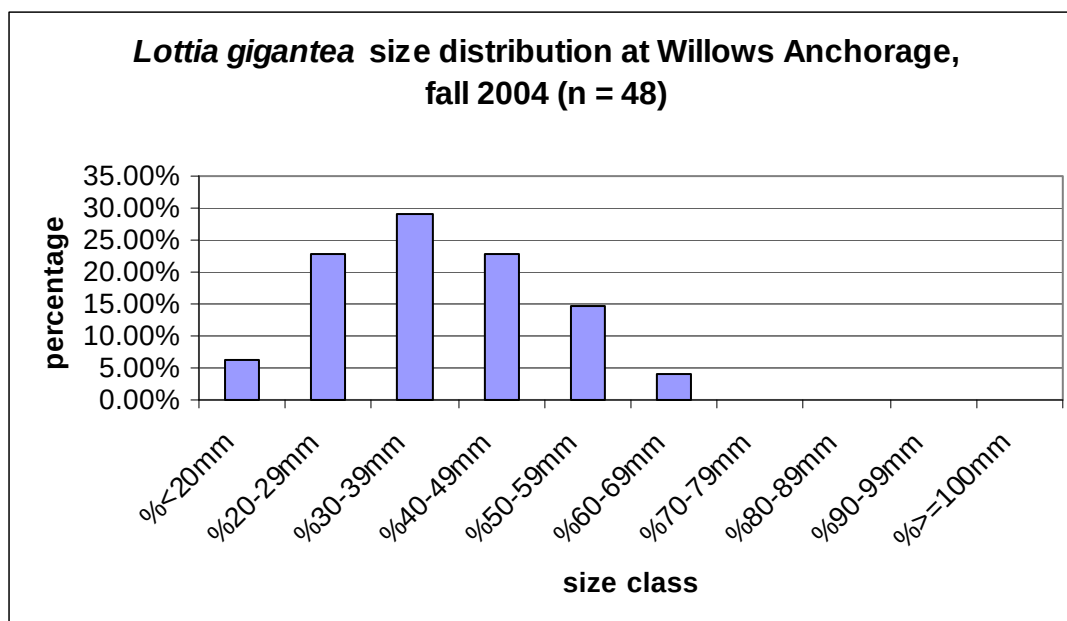
Mytilus was abundant and thick, seeming to cover almost every inch of their zone. *Endocladia* was common and I did not notice any of the bleaching which was observed last spring. Some of the articulated coralline algae in the *Endocladia* area were bleached, however. *Silvetia* looked very healthy and was common in the *Silvetia* and *Hesperophycus* plot areas. *Hesperophycus* was uncommon, consisting of small and short plants. Crabs were common and several small sea hares were left on the rocks as the tide went out.

Photoplot summary – mean percent cover by zone at Willows Anchorage, Santa Cruz Island, fall 2004 (5 plots/zone)

Zone Name	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc. Algae	Misc. Animal	Tar	Other
Endocladia	27.6	4.4	0.2	52.6	0.0	0.0	0.4	0.0	0.0	14.6	0.2	0.0	0.0
Rockweed	19.0	5.2	0.0	16.4	0.0	38.2	0.0	0.2	0.0	21.0	0.0	0.0	0.0
Mussels	1.0	0.0	0.0	0.0	0.0	0.0	78.2	0.0	0.4	0.2	0.2	0.0	0.0
Hesperophycus	39.8	5.2	0.0	15.0	3.4	27.4	0.0	0.0	0.0	9.2	0.0	0.0	0.0

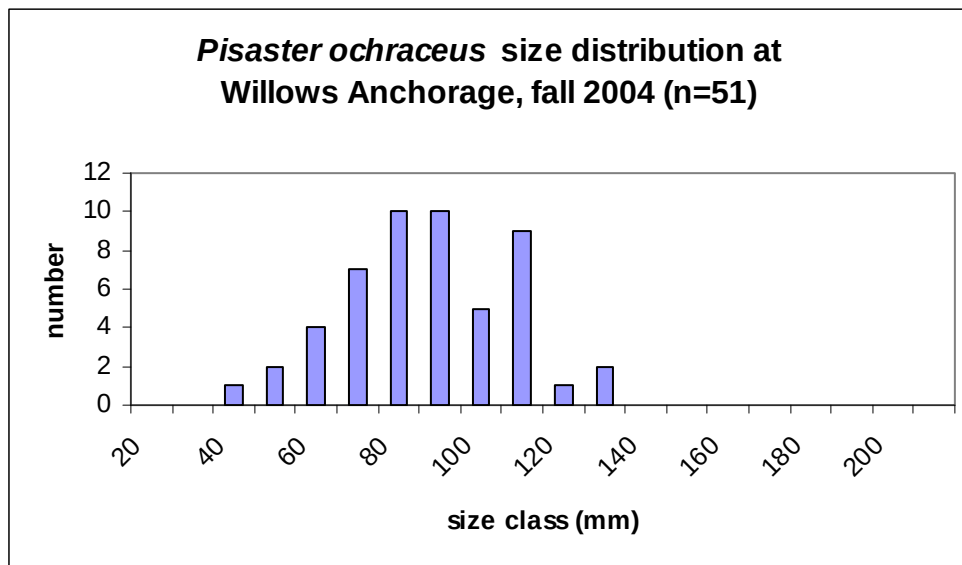
***Lottia gigantea* at Willows Anchorage, Santa Cruz Island, fall 2004:**

Plot	Count	Density	Mean Size	St. Dev.	Min Size	Max Size
1	9	2.865	39.44	13.61	16	64
2	15	4.776	41.33	10.83	26	62
3	13	4.139	34.38	10.52	20	52
4	11	3.502	37.64	16.09	17	59
5	Not sampled					



Seastar (*Pisaster ochraceus*) counts at Willows Anchorage, Santa Cruz Island, fall 2004.

<i>total</i>	<i>51</i>	<i>radius</i>	<i>brown/purple</i>	<i>orange</i>
Min size (mm)	35	<75mm	14	4
Max size (mm)	122	75-150mm	21	12
Mean size (mm)	82	>150mm	0	0
236 additional brown/purple and 92 orange stars not measured, not included above				
Total = 379 <i>P. ochraceus</i> on site				



Santa Rosa Island December 9-15, 2004

(Database event #2004-H)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Paula Rich, biological technician, Channel Islands National Park
Dawn Bailey, Volunteer
Kirsten Kusic, UCSC, PISCO
Haven Livingston, UCSC, PISCO
Allison Kendall, UCSC, PISCO
Eric Miller, UCSC, PISCO volunteer

PROCEDURE and general observations: travel to SRI on the Sea Ranger II. There was about 1.5 inches of rain in the last week, about one inch last Saturday and another half inch on Tuesday. We conducted the standard monitoring at each site, photographing plots with the digital Olympus camera and field scoring them, counting and measuring owl limpets, black abalone and seastars, and scoring point transects for surfgrass. I also conducted a general species list for each site. The PISCO crew conducted comprehensive surveys at four sites consisting of eleven vertical point contact transects, swath transects for seastars and abalone and random motile invertebrate plots in high mid and low zones on each transect. Tidal heights were also measured for plots in each the survey areas. We returned to Ventura on the Sea Ranger II on 12/15.

Results:

8 December 2004, Water Canyon Beach. Low tide +0.5 ft at 1308. Excellent conditions. After settling the PISCO crew into the campground we walked the beach. The beach was very clean except for some algae at both ends of the beach. The only animal we found was a buck mule deer behind one of the dunes. Numerous Pacific Loons and Surf Scoters were offshore. Black Phoebe, Rock Wren, and Song Sparrows were feeding along the beach.

9 December 2004, East Point, Low tide -0.5 ft at 1410 hrs. Excellent conditions with light wind and surge, and partly cloudy sky after heavy wet fog in the morning. Water temperature 16°C. At East point we saw four Black Oystercatchers, three Brown Pelicans, several cormorants, and a small flock of about 15 Black Turnstones. Two harbor seals were seen just offshore in the afternoon and about 100 harbor seals were on the reef at Abalone Rocks. We had to walk to the site because of the wet roads. We were on site from 1130-1700 hrs.

The site looked good with the exception of the *Hesperophycus* zone which had very low cover of *H. californicus*. There seemed to be good recruitment but the all the remaining old plants were bleached and worn. *Silvetia compressa* also had fairly high recruitment with young plants being common. Juvenile black turban snails, *Tegula funebris*, and juvenile shore crabs, *Pachygrapsus crassipes* were common. *Silvetia compressa* cover was moderate in the plots overall. Mussel cover was high with no obvious damage in the bed. Barnacle and *Endocladia* cover were typically low to moderate. All photoplots were field-scored. Surfgrass, *Phyllospadix* spp., was nearly 100% cover in all plots.

Two black abalone, *Haliotis cracherodii*, were found on the 30-minute search for seastars (93 and 147 mm). *Pisaster ochraceus* ranged from 43-173 mm, and were a little less abundant than

in past years. The mean size was 102 mm. Only 55 *P. ochraceus* and one *P. giganteus* were found.

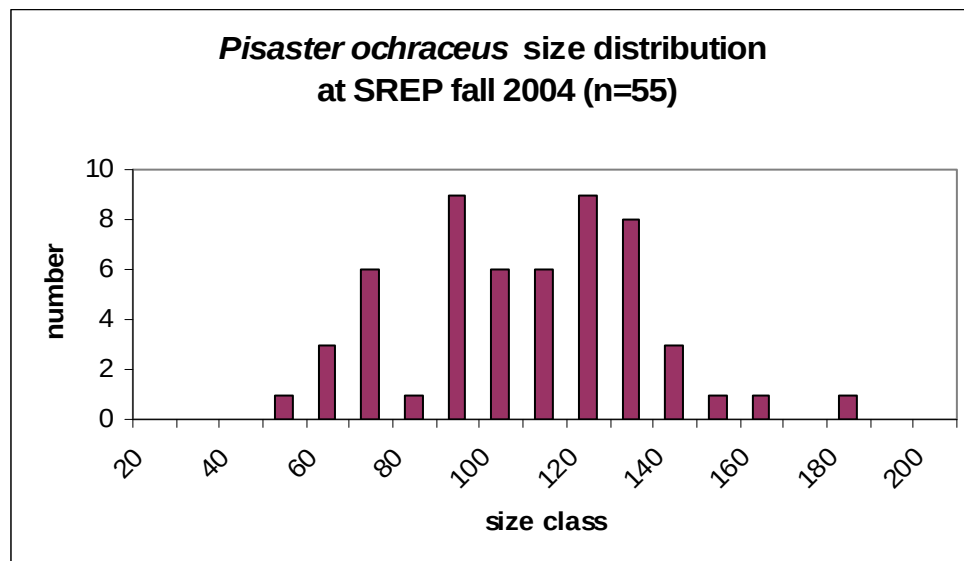
The PISCO crew completed the biodiversity survey transects. After completing our site, we were able to help them with motile invertebrate counts and data recording. They will need to return later to measure tide heights since no one wanted to carry the extra equipment for the long hike.

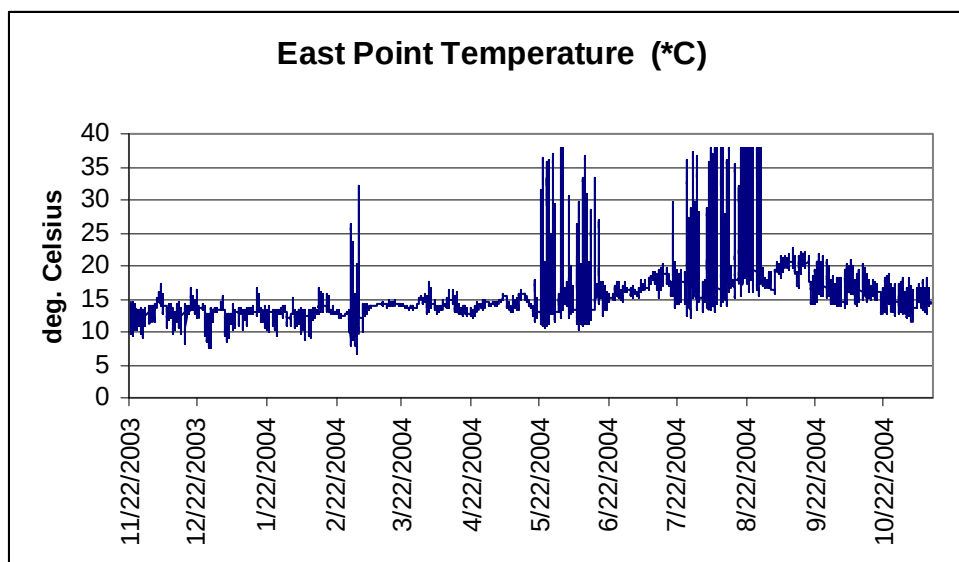
Photoplot summary – mean percent cover by zone at East Point, Santa Rosa Island, fall 2004 (5 plots/zone).

Zone	Bare Rock	Barnacle	Tetraclita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	62.4	18.2	0.0	8.4	7.2	0.4	0.0	0.0	0.0	2.6	0.4	0.4
Endocladia	29.8	1.6	0.0	46.8	14.6	3.2	0.0	0.0	0.0	4.0	0.0	0.0
Rockweed	18.8	0.0	0.0	1.2	1.0	61.6	0.2	0.2	0.0	16.2	0.8	0.0
Mussels	2.4	0.0	0.0	0.0	0.0	0.0	70.6	3.6	0.4	21.4	1.6	0.0
Hesperophycus	59.2	12.0	0.0	16.0	6.6	2.6	0.0	0.0	0.0	1.6	1.6	0.4

Surfgrass transect cover, East Point, Santa Rosa Island, fall 2004.

Location: East Point		Site Code: SREP	
Date 9-Dec-04	Recorders: Dan Richards		
<u>Taxa</u>	<u>Transect 1</u>	<u>Transect 2</u>	<u>Transect 3</u>
other red algae	0	0	7
Phyllospadix sp. overstory	100	100	93
total	100	100	100





10 December 2004, Low tide -1.1 at 1453 hrs. Excellent conditions but we were not able to drive to the west end because the roads were still too wet from the recent rains. We finished data processing and notes from East Point and did a little taxonomic review. We did go over to Lobo Canyon to hike and look at the intertidal at the mouth of the canyon to practice a little taxonomy in the afternoon. Banana slugs were out in abundance in the wet grass. Eric spotted a small hawk we tentatively identified as a sharp-shinned hawk.

11 December 2004, Johnson's Lee. Low tide -1.5 ft at 1539 hrs. Excellent conditions again, we were too hot most of the afternoon. The sky was clear and wind and surge were light. We delayed our start until 1000 to let the roads dry a little. We walked the last mile and a quarter because the road was muddy. We were on site from 1200-1700 hrs and we finished our work and the comprehensive surveys. Shore birds at the site included two black oystercatchers and two black turnstones. An elephant seal was in the surf just offshore as we approached. Elephant seals were present in the Johnson's Lee and Officer's Beach area.

I counted seastars in the three zones (413 *P. ochraceus* and one *P. giganteus* total) and Dawn measured 106 in zone one for size frequency and color ratio. The mean size was 71 mm, the range was 21-132 mm. No large stars were found and numerous small stars down to 30 mm arm length were measured. I measured one in another area at 20 mm, so it appears that *P. ochraceus* are recruiting in the area again. The 10 x 2 m transect on the outer reef had 59 *P. ochraceus*.

No black abalone were found in the plots. I measured three *Haliotis cracherodii* in the general search (91, 100, 177 mm), all in the eastern half of the site. *Lottia gigantea* numbers were low in three of the limpet plots. In the five plots, only a total of 103 were found. Sizes ranged from 11-93 mm but most were small indicating the population may be mostly young.

The temperature logger transferred okay after the initial download failed. The logger seemed to be working so it was placed back into the housing. Photoplots were field-scored except for 505 which was inadvertently missed and was later scored from the photo. *Phragmatopoma californica* colonies formed thick mats on the lower reef. *Pisaster ochraceus* were still abundant

overall and I think we can expect that they will continue to maintain the lower reef shelf as a *Phragmatopoma/ Anthopleura* dominated community. As *P. californica* colonies are broken off by wave action, *Ulva* sp. typically invade then the *P. californica* grows back again. *Mytilus californianus* are found in small patches and even grow among some of the *P. californica* colonies, but the *Pisaster ochraceus* continue to suppress their numbers there. *Mytilus californianus* are doing well on the higher parts of the reef and we should consider adding more mussel plots there to monitor mussels since four of the existing mussel plots are on the lower shelf and seem to be in a continual disturbed state with *Phragmatopoma* domination.

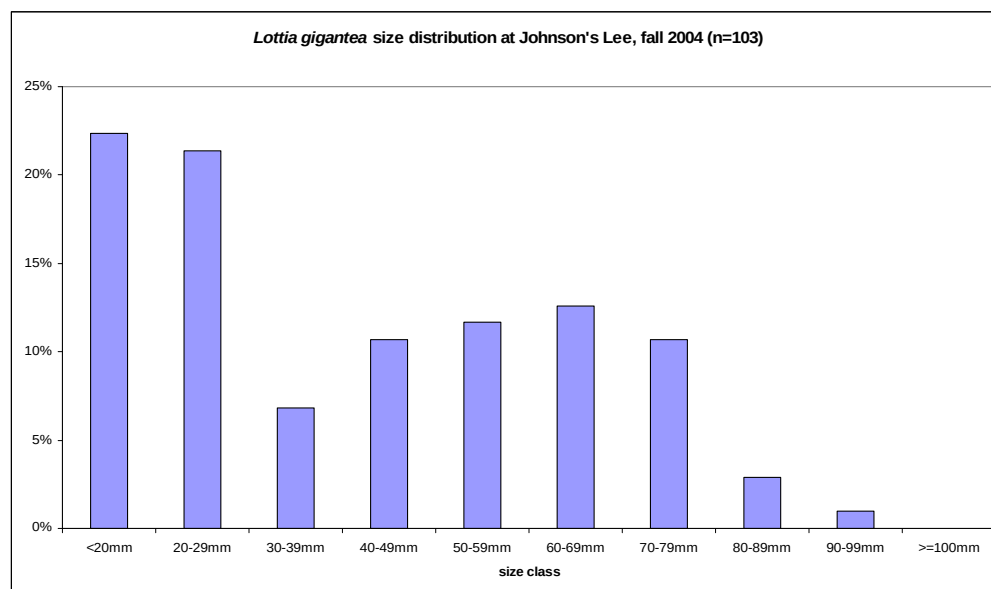
The PISCO team completed all the transects and tidal heights for the comprehensive surveys. We also measured the heights of all the photo plots.

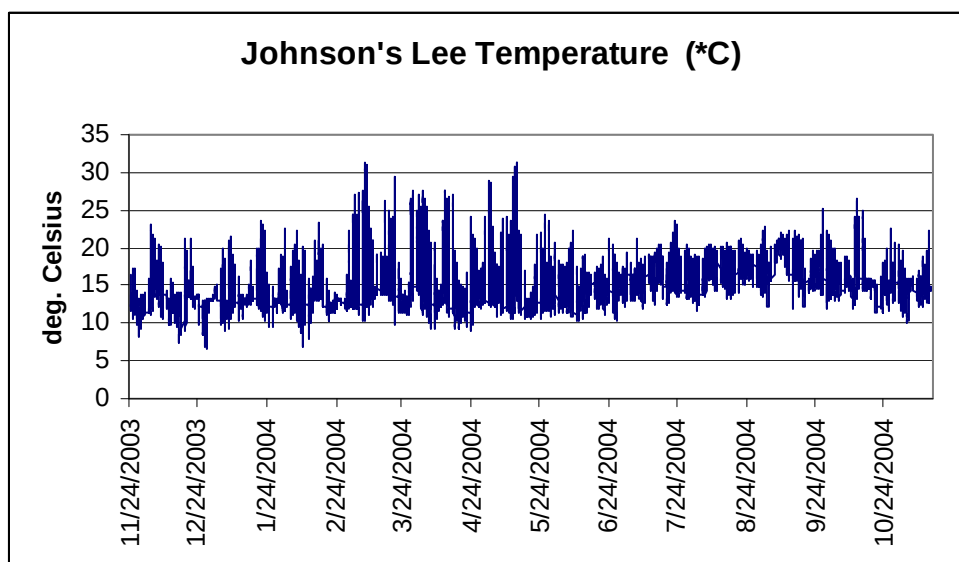
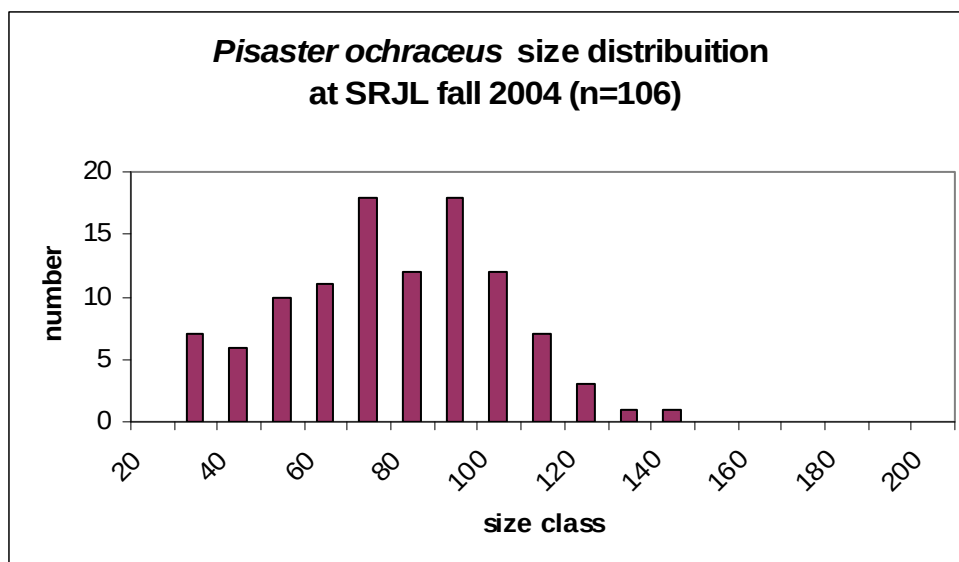
Photoplot summary – mean percent cover by zone at Johnson's Lee, Santa Rosa Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal
Barnacle	48.2	36.0	0.0	6.0	0.0	0.0	0.0	0.0	7.0	2.8
Endocladia	41.6	6.2	0.8	34.6	0.0	10.0	0.0	0.2	4.0	2.6
Mussels	6.6	0.0	0.0	0.0	0.0	15.6	9.2	0.2	14.6	53.8

***Lottia gigantea* size distribution at Johnson's Lee, Santa Rosa Island, fall 2004**

Plot	Area	Density	Count	MeanSize	StDev	MinSize	MaxSize
595	3.14	.955	3	58.33	5.51	52	62
596	3.14	4.457	14	62.64	22.94	18	86
597	3.14	3.820	12	34.92	18.39	11	62
598	3.14	10.506	33	41.91	23.92	13	93
599	3.14	13.053	41	35.05	18.22	12	68





12 December 2004, Fossil Reef. Low tide -1.6 ft at 1627 hrs. Heavy marine layer today but the wind and surge were light. We arrived at the site about 1100 and had to wait until 1200 for the tide to drop. We were on site from 1230-1830 hrs. The comprehensive surveys were completed as well. There were a fair number of Brandt's Cormorants on the bluff when we arrived. A few Pelagic Cormorants were on the reef, along with one Black Turnstone and 37 Black Oystercatchers. Fewer than 100 elephant seals and approximately 15 harbor seals were on the long beach to the west of the site.

Silvetia compressa was fairly abundant along much of the reef with many young plants as well as larger well established plants. This was the most recruitment seen here in sometime. There was a patch above plot 605, higher and separated from the other *Silvetia*, which was quite yellowish and generally short. I wondered about it being *Pelvetiopsis* sp. but later decided it was *Silvetia* after seeing the same color and shape further out on the reef with other *Silvetia* plants. Average

Silvetia cover for the five plots in that zone was 34%, the highest we have seen in a while. Mussel cover was also pretty high for this site with 22% cover, in spite of *Pisaster ochraceus* still being common on the reef.

There were a total of 47 *P. ochraceus* on the first 15m transect (through the mussel plots) and another 48 in the outer 15m transect. I measured 141 *P. ochraceus* in the transect and on the outer reef for size frequency and color ratio. Sizes ranged from 35-165 mm with a mean of 115 mm. Two black abalone were also found in the outer transect area (114, 162 mm). No abalone were in the plots. No other abalone were found in a general search.

A total of 233 *Lottia gigantea* were measured in the limpet plots. Sizes ranged from 13-96 mm. There was quite a bit of difference among the plots, both in size and number.

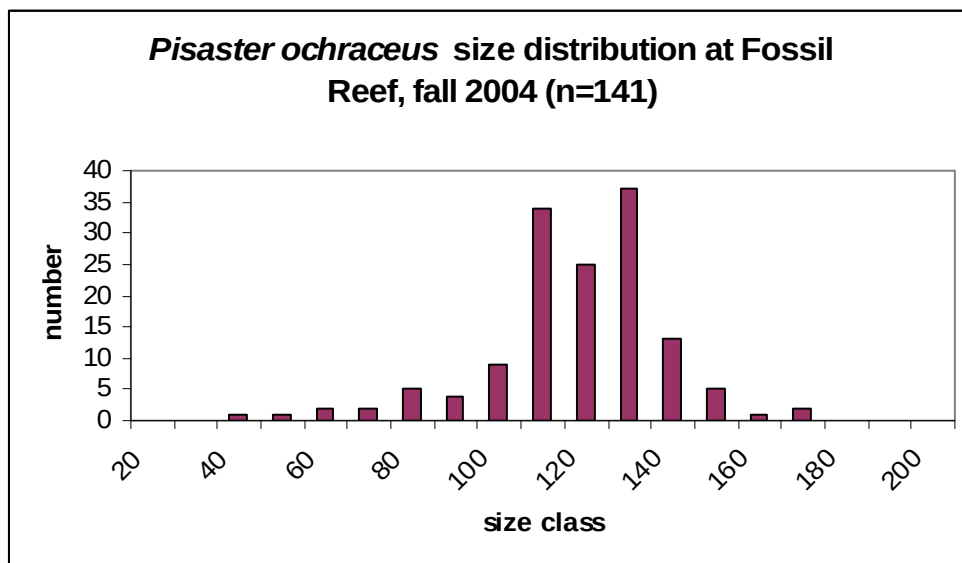
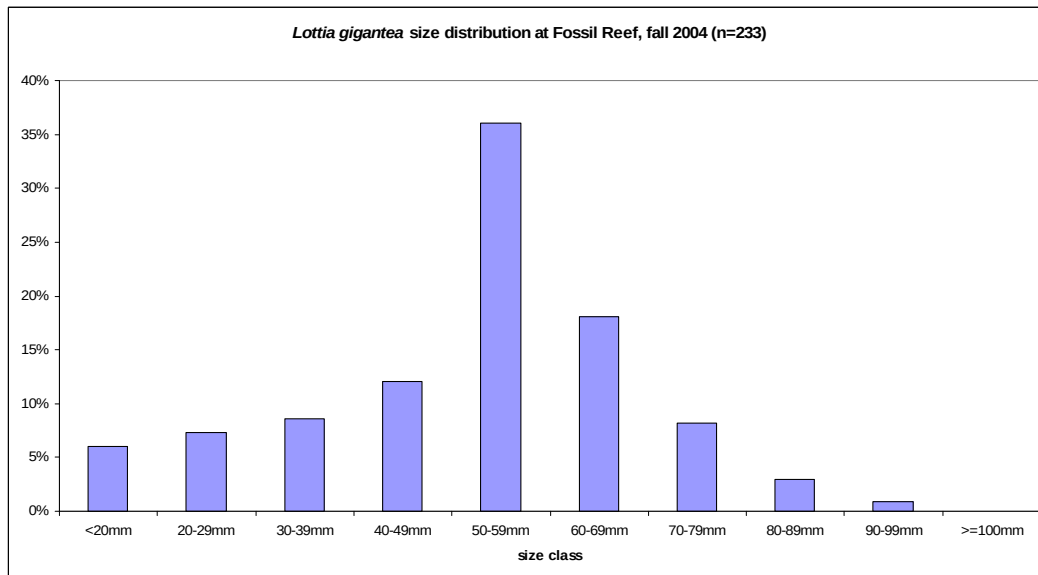
We measured the tidal heights of all the photoplots.

Photoplot summary – mean percent cover by zone at Fossil Reef, Santa Rosa Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	71.4	24.0	0.0	0.4	0.0	0.0	0.0	0.0	1.6	0.6	2.0
Endocladia	49.8	18.6	0.0	18.8	9.8	0.0	0.0	0.0	1.6	1.4	0.0
Rockweed	47.6	5.4	0.0	8.6	33.8	0.0	0.0	0.0	3.8	0.8	0.0
Mussels	16.8	2.4	5.2	0.0	0.0	22.0	12.0	1.6	27.8	12.2	0.0

***Lottia gigantea* size distribution at Fossil Reef, Santa Rosa Island, fall 2004**

Plot	Area	Density	Count	MeanSize	StDev	MinSize	MaxSize
1	3.14	1.910	6	58.17	4.36	54	63
2	3.14	5.412	17	49.41	13.60	19	72
3	3.14	10.188	32	71.31	13.05	39	94
4	3.14	24.833	78	51.74	12.57	15	76
5	3.14	31.837	100	44.86	16.02	13	71



13 December 2004, Northwest-Talcott. Low tide -1.6 ft at 1717 hrs. Marine layer in the morning but mostly clear in the afternoon. Wind and surge were light and the conditions were good but cold. There were three Black Oystercatchers on the reef and a large bull elephant seal was on the access beach. We were on site about noon but unable to begin working until 1300 hrs because of the tide level. We finished the site at 1700 hrs and helped with the last few measurements on the comprehensive survey finally leaving that site at 1815.

Silvetia compressa appeared healthy with good growth. Recruitment seemed to be good last year as there were many young plants. *Tegula funebris* were abundant and there were many juveniles. The *Phyllospadix torreyi* looked particularly dense and healthy. All three transects had nearly 100% cover of *Phyllospadix* overstory. There was very little bleaching. *Ulva* sp. seemed to be the main epiphyte and was fairly abundant on plants on the upper flat. *Smithora niadum* and *Melobesia* sp. were present on the surfgrass but not abundant. *Macrocystis* sp. and various

red algae, particularly *Chondracanthus spinosus* and *Prionitis lanceolata* were abundant at low tide. *Neorhodomela larix* was present but not very common, especially compared to past years when it was so abundant.

We only found two small *Pisaster giganteus* and two juvenile *Patiria miniata*. No *Pisaster ochraceus* were found. Two black abalone (95 and 153 mm) were found in the vicinity of the outer abalone plots but not in them. A total of 103 *Lottia gigantea* were measured in the low limpet plots ranging from 15 to 108 mm, the largest we have measured here.

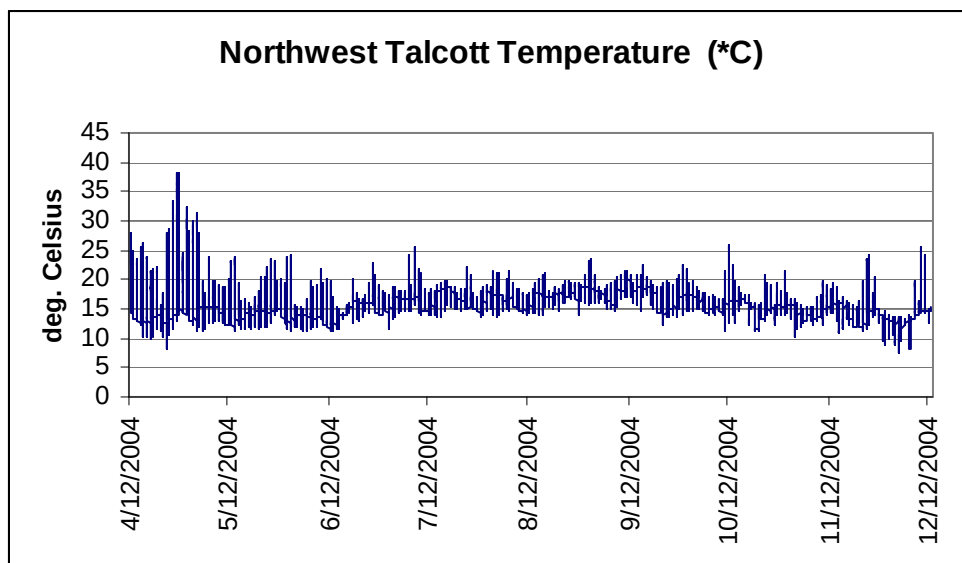
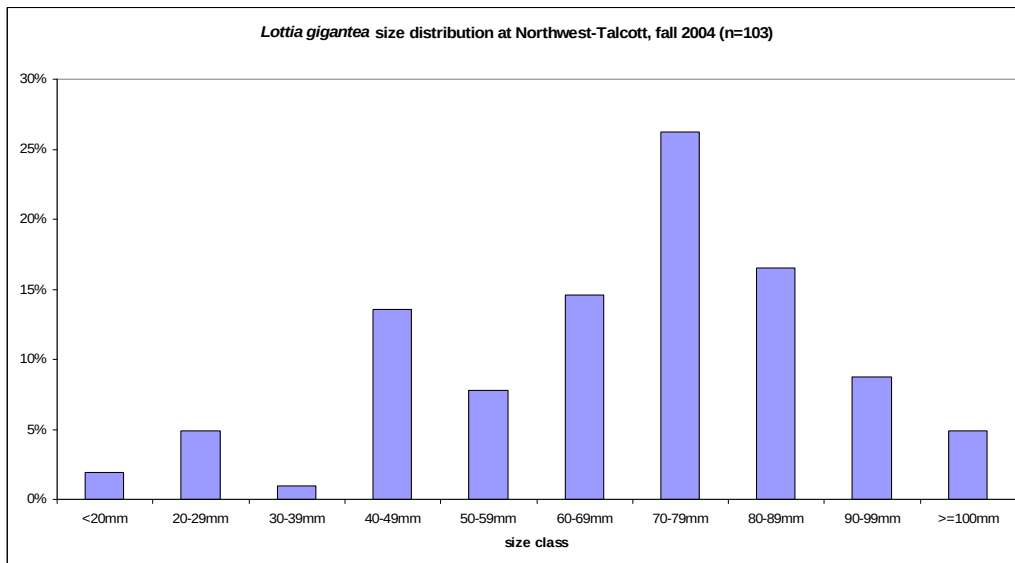
We measured tidal heights of all the plots including abalone, surfgrass and limpet plots.

Photoplot summary – mean percent cover by zone at Northwest-Talcott, Santa Rosa Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal	Tar
Barnacle	50.8	29.6	0.0	2.8	11.4	0.0	0.0	0.0	2.6	2.4	0.4
Endocladia	43.0	1.4	0.4	16.6	22.4	0.4	2.6	0.0	12.4	0.8	0.0
Rockweed	23.0	0.4	0.0	1.6	68.4	0.0	0.4	0.0	4.8	1.4	0.0
Mussels	22.0	0.0	0.8	0.2	0.0	55.0	1.6	5.0	11.6	3.8	0.0

***Lottia gigantea* size distribution at Northwest-Talcott, Santa Rosa Island, fall 2004**

<i>Plot</i>	<i>Area</i>	<i>Density</i>	<i>Count</i>	<i>MeanSize</i>	<i>StDev</i>	<i>MinSize</i>	<i>MaxSize</i>
701	3.14	7.959	25	78.40	25.16	19	108
702	3.14	8.278	26	71.31	19.92	25	98
703	3.14	7.641	24	63.79	14.55	35	88
704	3.14	5.094	16	65.63	16.16	26	92
705	3.14	3.820	12	54.08	20.27	15	76



Surfgrass transects Northwest-Talcott, Santa Rosa Island, fall 20004

Location: Northwest-Talcott		Site Code: SRNWT		
Date: 9-Dec-04		Recorders: Dan Richards		
<u>Taxa</u>	<u>Transect 1</u>	<u>Transect 2</u>	<u>Transect 3</u>	
Sand	0	0	1	
Erect coralline	1	0	0	
other red algae	1	1	13	
Phyllospadix sp. overstory	98	99	86	
total	100	100	100	

14 December 2004, Ford Point. Low tide -1.3 ft at 1810 hrs. Water temperature 14° C. It was a beautiful clear day with light wind but moderate surf forcing us to wait until almost 1400 hrs to begin monitoring. Six Black Oystercatchers were the only shorebirds seen. We were on site from about noon to 1800 hrs. Haven helped us out today and the rest of the PISCO crew went to East Point to measure tidal heights. They decided not to conduct comprehensive survey of Ford Point because of the close proximity of Johnson's Lee.

The site looked pretty normal except that the section of reef broken last spring was totally gone including plot 531. I would estimate the rock that broke away was approximately 8x1.5 m. Two large rocks were up against the reef below plot 527 that were probably part of the broken reef. The newly exposed rocks already appear weathered and had considerable *Ulva* sp. and *Phragmatopoma californica* colonies growing. Photos were taken of the area where we thought the plot 531 had been. The inter-plot measurements did not seem quite right but that might be a function of the large part of reef missing. No attempt was made to score the cover in the area of 531. We will probably establish a new plot but we did not do anything this time. Quite a few plot corner marker repairs were needed at the site.

Plot 532 had been invaded by *Pisaster ochraceus* and the percent cover of *P. ochraceus* was nearly equal to the cover of *Mytilus californianus*. *Pisaster ochraceus* were abundant with 345 counted in a 30-minute search. Size measurements (n=56) gave a range of 35-189 mm with most falling in the lower middle range. The mean size was 87 mm. Only one small *Pisaster giganteus* (20 mm) was found in the usual monitoring area.

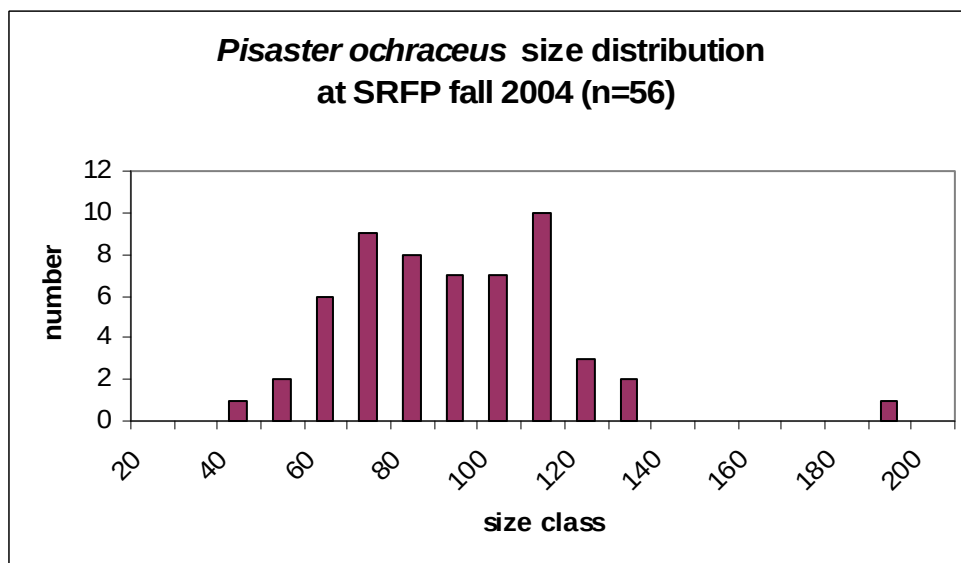
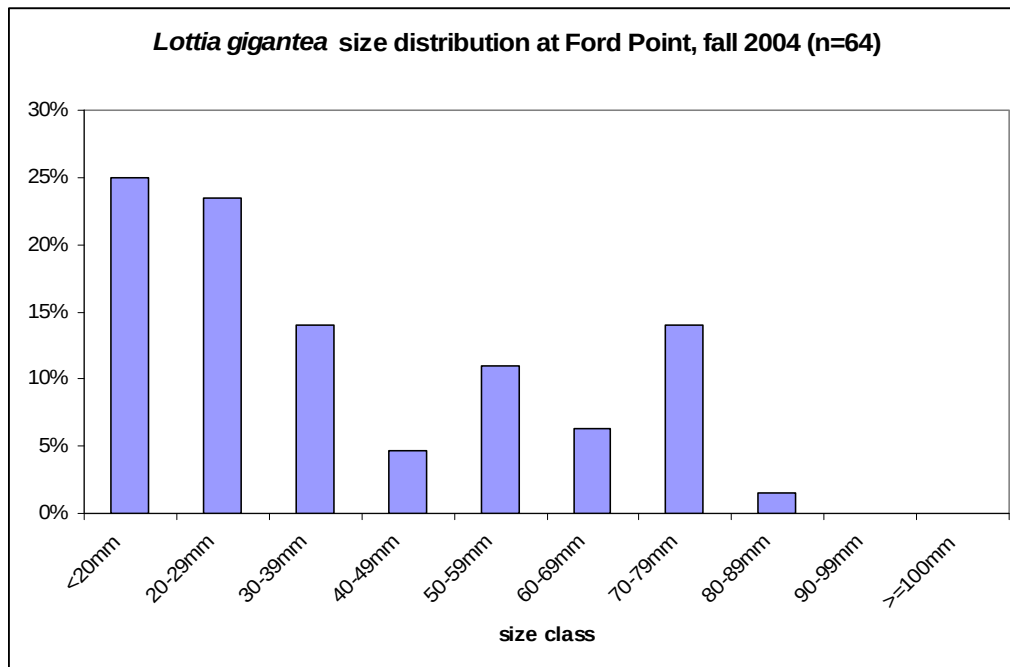
No abalone were found in the fixed plots, but we did find eleven black abalone ranging from 106-172 mm. *Phragmatopoma californica* dominated most of the abalone plot area. *Lottia gigantea* numbers were low in the plots, but they seemed to be common throughout the site, especially among the mussels and on the sandstone faces. A total of only 64 *L. gigantea* were found in the five plots. The size distribution seems to be shifting dramatically from all large animals to mostly smaller (<50 mm) sizes.

Photoplot summary – mean percent cover by zone at Ford Point, Santa Rosa Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Silvetia	Mussels	Turfweed	Leaf Barnacle	Misc Algae	Misc Animal
Barnacle	61.8	28.4	0.0	6.4	0.0	0.2	0.0	0.0	0.2	3.0
Endocladia	29.2	2.0	0.0	40.4	0.0	3.0	1.4	0.0	22.4	1.6
Mussels	30.8	2.0	0.0	2.2	0.0	10.2	9.2	0.2	20.6	4.8

***Lottia gigantea* size distribution at Ford Point, Santa Rosa Island, fall 2004**

Plot	Area	Density	Count	MeanSize	StDev	MinSize	MaxSize
600	3.14	2.229	7	62.29	22.13	18	82
601	3.14	2.547	8	30.75	14.34	18	64
602	3.14	2.865	9	58.56	19.69	20	76
603	3.14	2.229	7	41.57	23.97	14	72
604	3.14	10.506	33	27.85	14.70	14	70



***Pisaster ochraceus* at Santa Rosa Island, fall 2004**

	<i>SREP</i>		<i>SRJL</i>		<i>SRFR</i>		<i>SRFP</i>	
	All Pisaster	Orange stars only	All Pisaster	Orange stars only	All Pisaster	Orange stars only	All Pisaster	Orange stars only
count	55	18	106	26	141	36	56	10
stdv	27.2	24.3	25.0	18.3	20.8	24.2	26.5	12.2
min	48	60	21	48	35	35	35	58
max	173	160	132	120	165	140	189	99
mean	102	110	71	81	115	109	87	84

Santa Rosa Island Bird List for the week compiled by Eric Miller & Dan Richards

Northern Harrier	Rock Wren	Hermit Thrush
Peregrine Falcon	Black Phoebe	Bewick's Wren
American Kestrel	Say's Phoebe	Great Blue heron
Red-tailed Hawk	Sharp-shinned Hawk	Surf Scoter
Song Sparrow	Yellow-rumped Warbler	
Golden Crown Sparrow	Loggerhead Shrike	
Lark Sparrow	Common Yellowthroat	
Chipping Sparrow	Burrowing Owl	
White-crowned Sparrow	Golden Eagle	
Horned Lark	House Finch	
Western Meadowlark	Anna's Hummingbird	
Killdeer	Orange-crowned Warbler	
Northern Mockingbird	Western Gull	
Spotted Towhee	Black Oystercatcher	
Lesser Goldfinch	Black Turnstone	
American Pipit	Brandt's Cormorant	
Hutton's Vireo	Pelagic Cormorant	
Ruby-crowned Kinglet	Brown Pelican	
Common Raven	Pacific Loon	

Santa Cruz Island and Anacapa Island January 6-8, 2005

(Database event #2004-I)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Paula Rich, Marine Bio-tech, Channel Islands National Park
Rocky Rudolph, SCA Intern, Channel Islands National Park
Paula Power, Wildlife Biologist, Channel Islands National Park
Luman Moody, *R/V Shearwater* Captain
Charlie Lara, *R/V Shearwater* deckhand

PROCEDURE and general observations: Day trips were run each day from Ventura using the Marine Sanctuary Vessel *R/V Shearwater*. We only managed to get out on two of the five days scheduled because of the weather conditions. The area has had severe storms for almost three weeks, dumping over 10-15 inches of rain in the area. On 1/6 we went to Middle Anacapa and had excellent conditions. We finished all of Middle West (MW) with digital photos, field scoring, motile invert count, seastar count; and Middle East (ME) photos and plot repair only. We did not search for abs at Harbor Seal Arch. On 1/8 we went to Scorpion Rock, with generally good conditions but a little rain. There we completed the digital photos, field scoring and seastar counts. Photos were taken with an Olympus 5050 digital camera. Photoplots were scored in the field except for Middle Anacapa East, which was scored from the digital photos. Seastars and abalone were counted within the defined areas of the reef. Seastars were measured with calipers at all sites. The maximum number of shorebirds and pinnipeds seen at any one time was recorded.

6 January 2005, Middle Anacapa (East and West). Low tide -0.2 ft at 1308 hrs, excellent weather with partly cloudy sky, light variable wind, and light swell. Water temperature was 14.5°C. In the area we saw seven black oystercatchers, one wandering tattler, and three black turnstones. There was one harbor seal in the water watching us. We were on the west site from 1000-1515 hrs., then moved to the East site finishing about 1615 hrs. We departed Ventura about 0800 and returned about 1730 hrs.

We did not field score plots or count motile invertebrates at Middle East (ME) because of lack of time. We did make some needed plot corner repairs though. The temperature logger at Middle West (MW) was down loaded and appeared to be working fine.

Silvetia compressa was not abundant but it appeared healthy and it covered more than half of each of the plots at MW with the exception of plot 454 which is on the edge of a tidepool and not very good habitat for *S. compressa*. Cover at ME was a little higher. *Hesperophycus californicus* was present but most plants had seen better days. Barnacle cover was fairly low in general at both sites. *Endocladia muricata* cover was only moderate but individual plants appeared healthy. *Mytilus californianus* was abundant in most of the plots with the beds being very thick and multi layered. The Mussel bed appears to be ripe to lose patches because so many mussels are only attached to other mussels and not the rock. Because of the dense mussels, we only found one corner of plot 466. Alignment of the photoplot may be off but the entire area had high cover of mussels.

A total of 86 *Pisaster ochraceus* were measured with arm lengths ranging from 24-160 mm with a mean size of 117 mm. Three *Haliotis cracherodii* were found at the main Middle West site but no check was made at the Harbor Seal Arch plots because of time. *Pachygrapsus crassipes* were common and some tidepools seemed to be full of large shore crabs. Motile invertebrate abundance seemed to be only moderate as limpets and *Littorina* spp. were fairly in low abundance. *Nucella emarginata*, *Acanthina* sp. and *Ocenebra circumtexta* were all present in all the mussel plots and in a few plots in each of the other zones (except *N. emarginata* was missing from the rockweed zone).

Photoplot summary – mean percent cover by zone at Middle Anacapa West, fall 2004 (5 plots/zone)

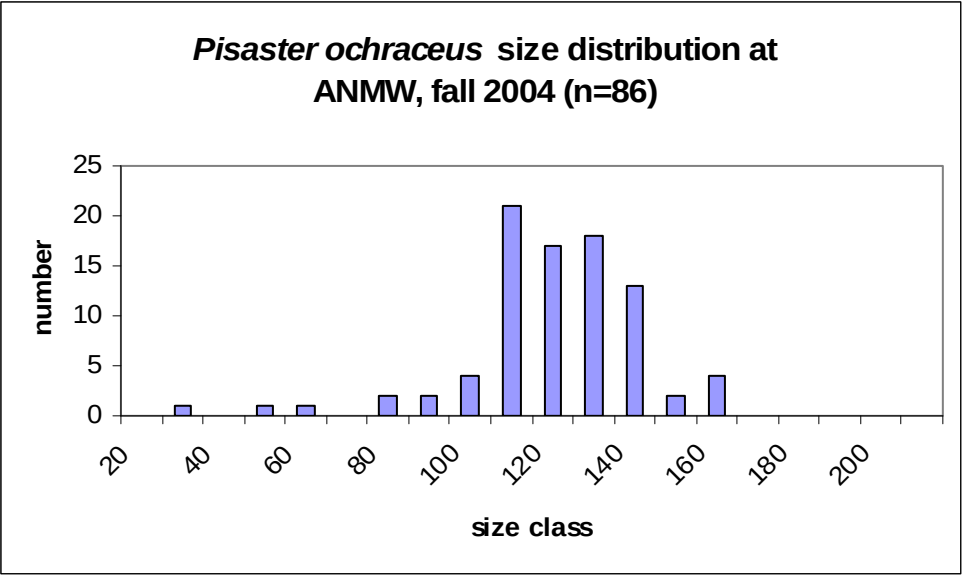
Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal
Barnacle	53.4	9.0	0.4	12.6	1.6	0.0	2.0	1.6	0.0	18.6	0.8
Endocladia	47.2	3.6	0.6	20.2	0.0	0.0	12.0	0.0	1.0	13.8	1.6
Rockweed	15.0	0.4	1.4	3.4	0.4	51.8	0.4	1.8	0.0	24.2	1.2
Mussels	8.2	0.2	1.2	0.2	0.0	0.0	83.4	0.0	0.2	6.0	0.6

Photoplot summary – mean percent cover by zone at Middle Anacapa East, fall 2004 (3 plots/zone)

Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Other
Barnacle	54.0	16.7	7.7	11.3	0.0	0.0	2.3	0.0	0.0	8.0	0.0	0.0
Endocladia	37.3	11.0	6.3	17.7	8.7	6.7	5.0	0.0	0.0	6.3	0.0	1.0
Rockweed	6.3	2.0	1.7	1.0	0.3	65.3	11.0	3.0	0.0	8.7	0.3	0.3
Mussels	0.0	0.0	0.3	0.0	0.0	0.0	96.7	0.0	0.3	2.3	0.0	0.3

Seastar counts at Middle West, Anacapa Island, fall 2004

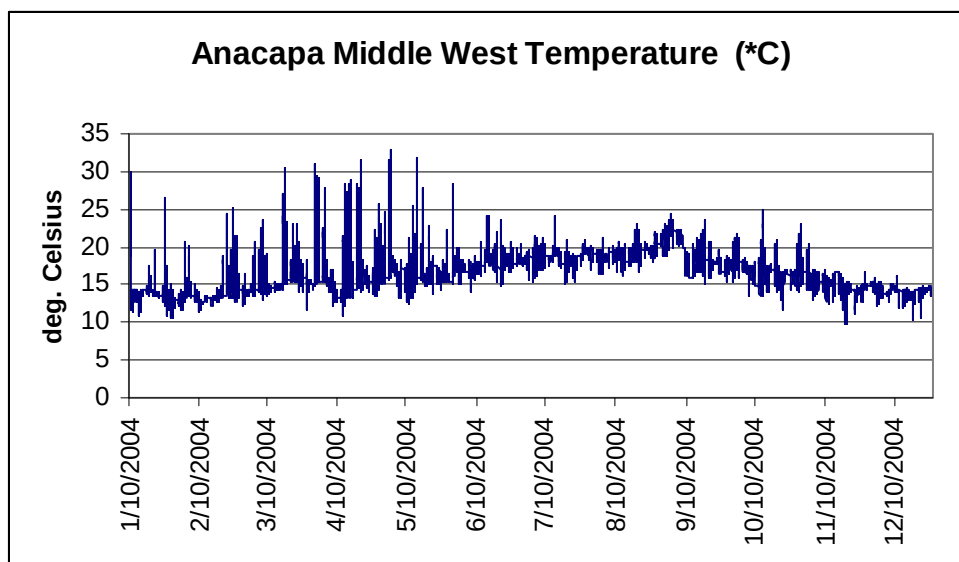
<i>Pisaster ochraceus</i>	orange	brown/purple	total
small (<75mm)	1	3	4
med (75-150mm)	19	59	78
large (>150mm)	1	3	4
total	21	65	86 grand total



**Motile invertebrate counts and size frequency measurements at Middle West,
Anacapa Island, fall 2004**

<i>ANMW fall 2004</i>	<i>Size Frequency measurements (mm) from motile invertebrate counts</i>			
	<i>Nucella emarginata</i>	<i>Acanthina spp.</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
mean	17	13	12	23
stddev	5	3	3	8
min	10	6	5	13
max	27	19	19	41
count	46	62	76	35

<i>zone</i>	<i>total</i>	<i>Barnacle</i>					<i>Endocladia</i>					<i>Silvetia</i>					<i>Mytilus</i>				
<i>plot #</i>		<u>447</u>	<u>448</u>	<u>449</u>	<u>450</u>	<u>451</u>	<u>457</u>	<u>458</u>	<u>459</u>	<u>460</u>	<u>461</u>	<u>452</u>	<u>453</u>	<u>454</u>	<u>455</u>	<u>456</u>	<u>462</u>	<u>463</u>	<u>464</u>	<u>465</u>	<u>466</u>
Lepidochitona spp.	25		1		2	3		3		1		1	2	2	3	3	2	1	1		
Nuttalina spp.	59		7	2	2	2	6	6	12					2	4	1	3	4	6	1	1
Fissurella volcano	15						1							4	3	3	1	1	1		1
Pachygrapsus	69	1	5	1		2	8	2	5	3			7	2	4	3	10	5	7	3	1
Pagurus spp.	9					2			7												
large limpets(>15mm)	56	1	3	1	1	1	3	1	3			4	1	1	3	17	1		2		13
S. purpuratus	2																			1	1
Amphissa versicolor	4						1													3	
Mopalia spp.	1								1												
Haliotis cracherodii	1														1						
Nucella emarginata	46		4				2	1									7	11	10	9	2
Acanthina spp.	62	1	7	4	6	3	3	5	3	1		10	3	1		3	1	3	5	2	1
Tegula funebris	0																				
Ceratostoma nuttali	0																				
Ocenebra circumtexta	77		4	2		1	6	9						2	2		10	9	12	7	13
Lottia gigantea	35		2			1	3	4				2				1	6	6	2	5	3
Littorina spp.	124	18	8	2	2	3	5	0	0	61	18	3	2	0	0	1	1	0	0	0	0
Limpet < 5 mm	2	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Limpet 5-15 mm	731	6	38	13	13	50	46	46	59	33	10	22	26	21	6	19	37	77	74	69	66
Homalopoma	3																			3	



8 January 2005. Scorpion Rock, Santa Cruz Island. Low tide -1.4 ft at 1439 hrs. Water temperature: 14°C. Conditions were good with light wind and light swell. The sky was dark with heavy clouds and we had a couple of rain squalls hit us near the end of the day. There was heavy rain on 1/7 and there were waterfalls coming off the island. There were numerous Brown Pelicans roosting on the outside of Scorpion Rock (~100-150). At the *Hesperophycus* plot site there were two Black Oystercatchers and one American Oystercatcher. There were two Western Gulls. No pinnipeds or people were in the area. We saw one gray whale each direction about mid-channel. We were on site from 1200-1530 hrs. We departed Ventura about 0950 and returned about 1630 hrs.

The *Hesperophycus californica* seemed to be growing fine and individual thalli were wide and green. Several *Silvetia compressa* plants were in the plots and were dense and at least in one case quite long. *Hesperophycus* cover ranged from 8-53% with all plots doing well except plot 814 where the plot is on the side of the rock and the bolder shifted a few years ago. *Balanus glandula* cover was quite high (20-66%) in the *Tetraclita* zone and 12-54% in the Barnacle zone. *Endocladia muricata* was common (33-51%) in four of the plots but missing from the fifth). *Mytilus californianus* cover was very low (5-19%) and those plots were usually dominated by *Tetraclita rubescens* with a fair amount of weedy algae or *Balanus glandula*. Large patches of mussels were gone, leaving either rock covered with small weedy algae or dense patches of barnacles. *Endarachne binghamiae* was present but patchy. *Balanus/Chthamalus* and *T. rubescens* recruitment seemed to be high. There was moderate recruitment of mussels, both rockweeds and *Pollicipes polymerus*.

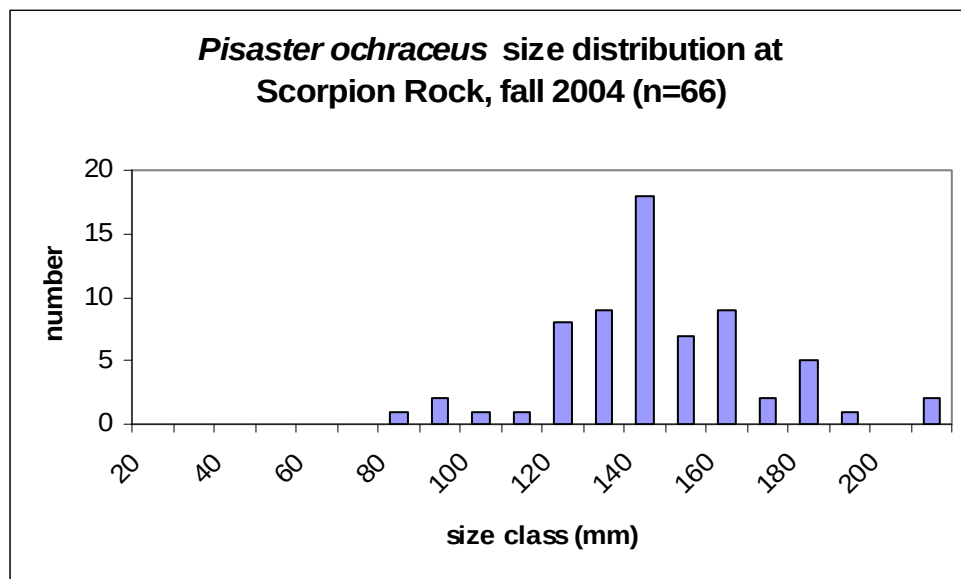
Nemerteans (ribbon worms) were common. Several small purple nemerteans and one large red worm were found crawling around on mussels. *Pisaster ochraceus* were common with a total of 103 found with sizes ranging from 80-210 mm, and a mean size of 139 mm. No abalone were found on the reef.

Photoplot summary – mean percent cover by zone at Scorpion Rock, Santa Cruz Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetraclita	Endocladia	Hesperophycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal
Barnacle	33.8	34.0	0.0	31.8	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Endocladia	17.2	6.8	0.2	54.8	0.0	0.0	2.4	0.2	1.2	17.0	0.2
Mussels	11.4	6.6	23.6	0.0	0.0	0.0	10.2	2.0	2.2	41.4	2.6
Tetraclita	28.6	39.0	7.0	2.0	0.0	0.0	11.6	0.0	1.8	7.6	2.4
Hesperophycus	30.2	0.4	0.0	16.8	35.4	9.4	0.6	0.0	0.2	6.4	0.6

Seastar counts at Scorpion Rock, Santa Cruz Island, fall 2005

<i>Pisaster ochraceus</i>	orange	brown/purple	Total
small (<75mm)	0	0	0
med (75-150mm)	20	56	76
large (>150mm)	8	19	27
Total	28	76	103 grand total



San Miguel Island January 20-25, 2005

(Database event 2004-J)

PERSONNEL: Paula Rich, Biological Technician, Channel Islands National Park
Santiago Arredondo, SCA, Channel Islands National Park
Ann Fossum, SCA, Channel Islands National Park

PROCEDURE and general observations. We flew out to San Miguel Island on Thursday, January 20, with Channel Islands Aviation, arriving at the ranch landing strip about 10:40am. We stayed in the bunkhouse and hiked to different intertidal or beachwalk sites every day. Standard procedures were used for monitoring the rocky intertidal sites. Plots and site overviews were photographed with an Olympus Camedia 5050 digital camera. Most photoplots were scored in the field. Owl limpets were counted and measured in fixed plots. Seastars and black abalone were counted and measured at all sites. Numbers of shorebirds and pinnipeds present at each site were recorded. Repairs to plot markers were made as needed. Two beach surveys were conducted according to standard protocol established for the beachwalk monitoring program, which is associated with the bald eagle reintroduction program.

20 January, 2005, Cuyler Harbor beachwalk survey. After settling in and having lunch, we walked down to Cuyler Harbor to conduct a beachwalk, from about 1300 to 1500 hrs. It was sunny and warm, but the ocean swell was about 12 to 15 feet so this was not a good day to try intertidal monitoring. There was a good amount of water in Nidever Canyon, creating a waterfall near the beach. We counted about 355 elephant seals (*Mirounga angustirostris*) on the beach, at least 100 of which were pups. A few had very new babies, as the placenta was still visible. We found only 1 sea lion carcass and 3 elephant seal pup carcasses, and no bird carcasses. However, we could not cover all parts of the beach because of the seal population. There were large numbers of willets (104) and whimbrels (54) feeding on the beach, as well as about 73 western gulls. There were also small numbers of marbled godwits, ring billed gulls, black oystercatchers, a black turnstone and a black bellied plover. A group of about 20 surf scoters was in the water not far from shore. The beach was quite clean of debris, although we did find some washed up Arundo.

21 January, 2005, Otter Harbor. Low tide -0.4 at 1431 hrs. We left the bunkhouse about 7:15am and hiked to Point Bennett, as Santiago and Ann had not been there before. After admiring the view and Bob's new housing, we walked back to Otter Harbor, arriving there about 11:30. Ocean swell was 8 to 10 feet, but did not affect our site much. The day was sunny and calm, with a light wind and comfortable temperature. Water temperature was 14°C. There were about 25 harbor seals hauled out when we arrived, a group of about 20 gulls and 5 black oystercatchers on site. Later we found what had attracted the gulls – a dead baby harbor seal. A large male elephant seal was laying on the small pocket beach to the east, and he occasionally swam over to monitor us. We were onsite from 1130 to 1700 hrs.

After a quick lunch, we started locating plots and taking photos. I scored photoplots; all except 374 were field scored. Ann recorded for me, then counted and measured seastars at low tide. She found 9 orange and 19 brown, 28 in total, during a 40 minute search. In spring 2004 the seastar count was 13; in fall 2003 it was 47. A good abalone search was not conducted, although

Ann found one. Santiago measured owl limpets in plots 1-3, Ann measured in plots 4-5. I made repairs to 5 plot corners. We left the site about 5:00pm and were back at the bunkhouse about 7:15pm.

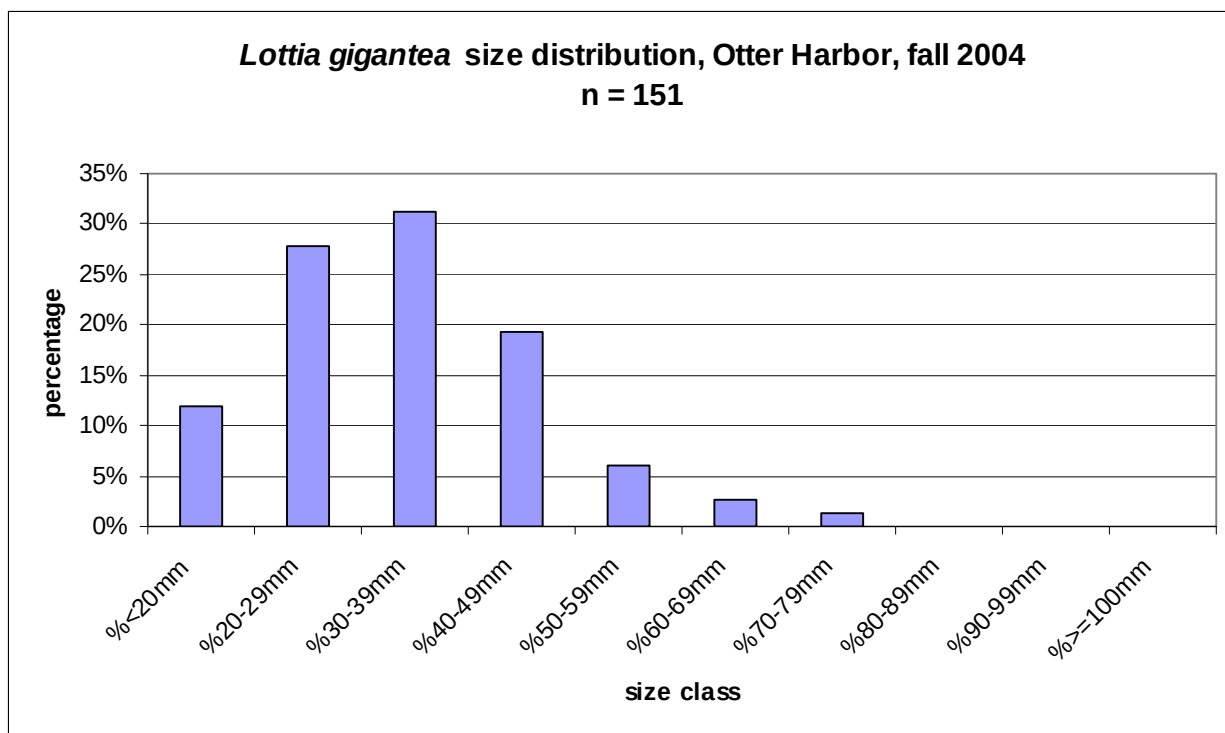
Overall, the site appeared to have changed little since last spring. The target species all looked healthy. The numbers of limpets in the plots have decreased substantially since last fall, especially L3, 4, and 5. As in the past, there is heavy encroachment into the plots by *Mytilus*, *Endocladia*, *Ulva*, *Cladophora*, *Tetraclita*, red algae, and even some *Phyllospadix* in L3.

Photoplot summary – mean percent cover by zone at Otter Harbor, San Miguel Island, fall 2004 (5 plots/zone)

<i>Zone Name</i>	<i>Bare Rock</i>	<i>Barnacle</i>	<i>Tetra-clita</i>	<i>Endo-cladia</i>	<i>Hespero-phycus</i>	<i>Silvetia</i>	<i>Mussels</i>	<i>Turf-weed</i>	<i>Leaf Barnacle</i>	<i>Misc. Algae</i>	<i>Misc. Animal</i>	<i>Tar</i>	<i>Other</i>
Barnacle	32.8	36.2	0.0	0.2	0.0	0.0	0.0	5.4	0.0	23.2	0.0	2.2	0.0
Endocladia	23.2	4.2	0.4	45.4	0.0	7.2	1.2	0.0	0.0	18.0	0.4	0.0	0.0
Rockweed	27.8	18.6	1.2	16.8	0.0	10.8	0.0	0.0	0.0	22.4	1.4	1.0	0.0
Mussels	11.4	0.2	1.2	0.0	0.0	0.0	54.4	0.2	4.8	26.2	1.6	0.0	0.0

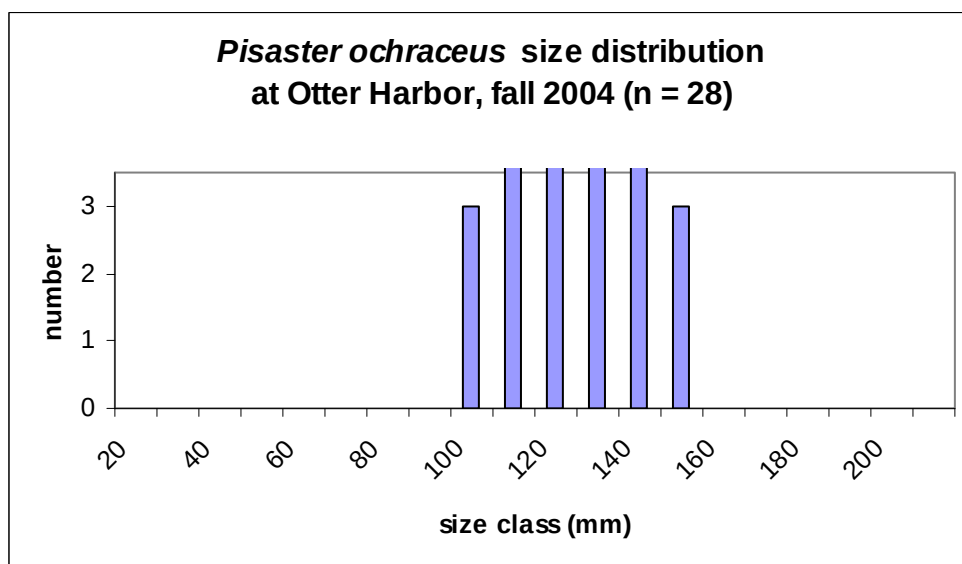
***Lottia gigantea* at Otter Harbor, San Miguel Island, fall 2004**

<i>Plot</i>	<i>Count</i>	<i>Density</i>	<i>Mean Size</i>	<i>St. Dev.</i>	<i>Min Size</i>	<i>Max Size</i>
1	33	10.506	35.61	12.42	15	66
2	46	14.645	33.13	13.63	16	77
3	27	8.596	37.33	13.69	18	71
4	14	4.457	29.29	11.93	16	53
5	31	9.869	31.97	9.28	17	59



Seastar (*Pisaster ochraceus*) counts at Otter Harbor, San Miguel Island, fall 2004

<i>total</i>	<i>28</i>	<i>radius</i>	<i>brown/purple</i>	<i>orange</i>
mean	123.3 mm	<75mm	0	0
min	95 mm	75-150mm	19	9
max	150 mm	>150mm	0	0



22 January, 2005 Simonton Cove beachwalk survey. We left the bunkhouse at 7:40am and hiked to the end of the Harris Pt. trail. Leaving our packs there, we went down to Simonton Cove to conduct a beach survey. We were on the beach from about 9:00 to 10:30. There was a moderate amount of kelp wrack, with *Arundo* (roots and all) washed up from recent storms. There were about 100 elephant seals on the beach, about 30 of which were new pups nursing from their mothers. We saw 2 snowy plovers, about 15 black oystercatchers, 1 sanderling, 2 ravens, 4 western gulls, and 1 song sparrow. Carcasses included a tufted puffin, northern fulmar, 1 elephant seal pup, and 1 California sea lion. I picked up a small cetacean skull to bring back for identification. There were several fresh tar pancakes in the sand, about 6 to 10 inches in diameter. We walked about a mile to the first rock outcropping, but as the tide was still fairly high and our time was limited we did not try to continue.

22 January, 2005, Harris Point. Low tide -0.6 at 1504 hrs. We were on site from 1115 to 1700 hrs. The ocean swell was 5 – 7 feet, but did not affect our site much. The weather was sunny, calm and warm. Water temperature was 14.5°C. There were 8 harbor seals hauled out on the site, and 1 elephant seal was in the water for a few minutes. Two pelicans and six gulls were on the large rock offshore. After a quick lunch, we started locating plots and I took pictures. As soon as the tide was low enough, Santiago started measuring limpets in the plots. I scored 17 of the 25 photoplots with Ann helping as recorder. At about 3:00, Ann conducted a 30 minute seastar and abalone search, finding 11 black abalone and 6 *Pisaster ochraceus*. One ab and one star were found in the transect crevice. No repairs were needed to the plot corners, but many were overgrown and hard to find, requiring much scraping of *Endocladia*, barnacles and encrusting coralline algae.

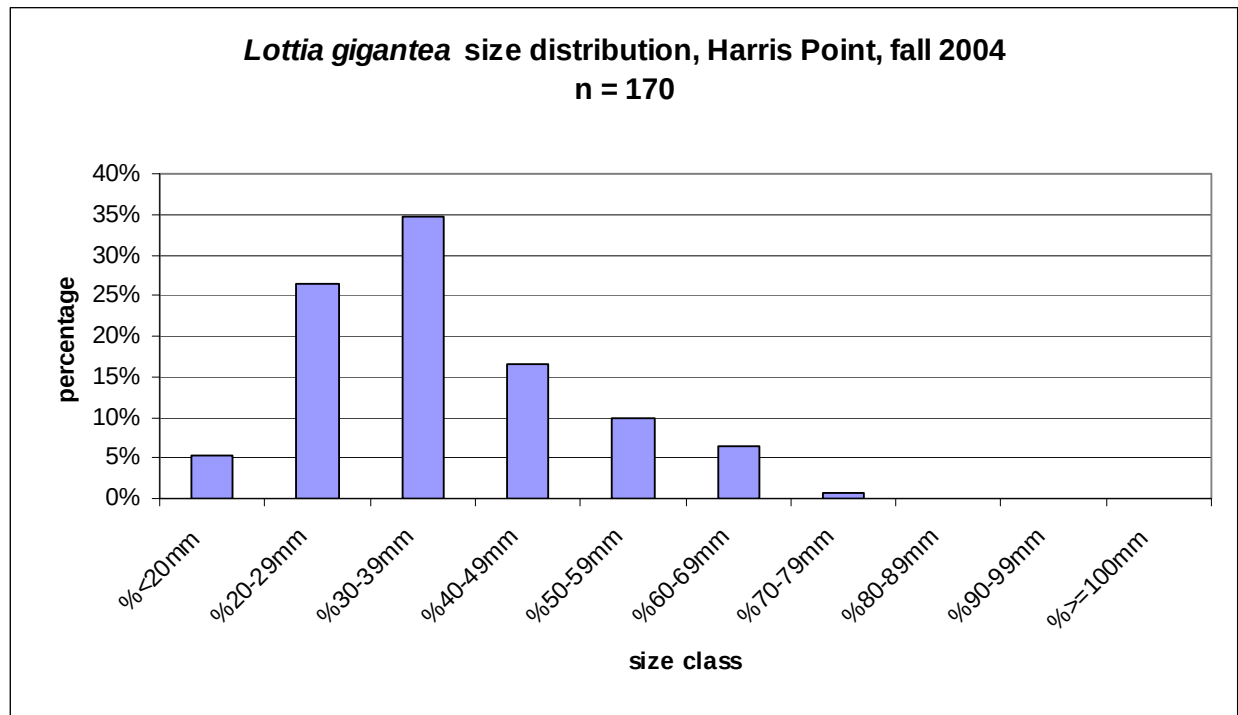
Hesperophycus looked very healthy and recruitment was apparent. Mussels were big and fairly widely spaced, with not much recruitment. *Endocladia* and barnacles looked about the same, but judging by the scraping there has been some recruitment. Limpet numbers did not vary much from last fall, with the plots showing about the same encroachment by *Endocladia*, together with *Mytilus* in L3 and L5.

Photoplot summary – mean percent cover by zone at Harris Point, San Miguel Island, fall 2004 (5 plots/zone)

Zone Name	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc. Algae	Misc. Animal	Tar	Other
Barnacle	23.8	71.6	0.0	4.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Endocladia	18.8	22.6	0.2	36.4	14.4	0.0	1.2	0.0	0.0	5.6	0.8	0.0	0.0
Mussels	20.8	8.6	7.6	4.8	1.2	0.0	41.0	0.0	0.6	13.4	2.0	0.0	0.0
Tetraclita	15.6	5.4	16.4	3.8	0.2	0.0	16.2	2.0	0.4	37.8	2.2	0.0	0.0
Hesperophycus	23.8	3.4	0.2	25.8	41.4	0.0	0.0	0.0	0.0	5.0	0.2	0.2	0.0

***Lottia gigantea* at Harris Point, San Miguel Island, fall 2004:**

Plot	Count	Density	Mean Size	St. Dev.	Min Size	Max Size
1	3	.955	35.33	5.13	31	41
2	24	7.641	40.04	14.49	19	63
3	46	14.645	38.24	8.69	21	62
4	68	21.649	29.68	6.47	16	43
5	29	9.233	49.59	15.54	18	70

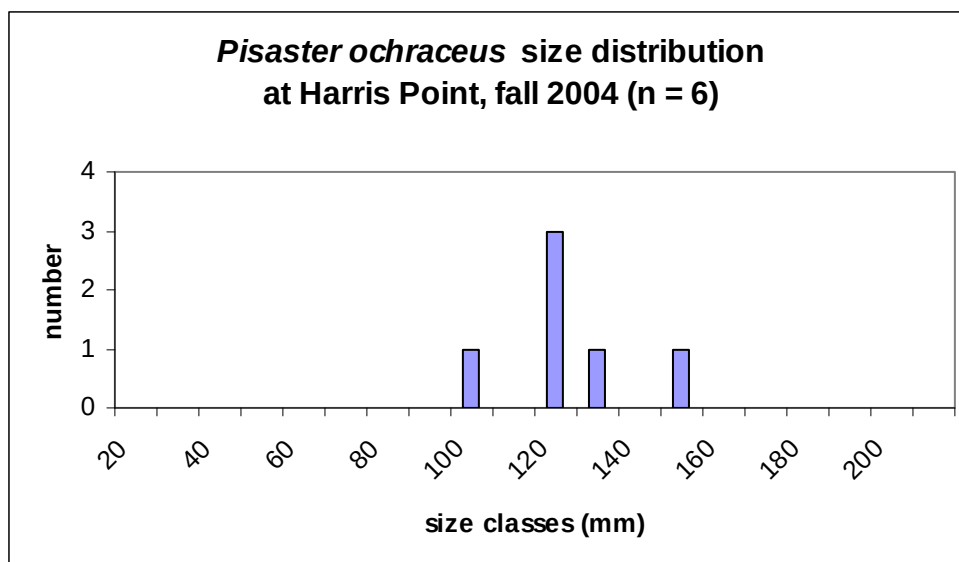


Black abalone (*Haliotis cracherodii*) at Harris Point, San Miguel Island, fall 2004

Site Code	Count Size	Mean Size	St. Dev.	Min Size	Max Size	%<45mm	%45-126mm	%127-145mm	%>145mm
HP	11	110.45 mm	16.50	80	145	-	90.91%	9.09%	-

Seastar (*Pisaster ochraceus*) counts at Harris Point, San Miguel Island, fall 2004

Total	6	radius	brown/purple	orange
Mean		119.5 mm	<75mm	0
Min		100 mm	75-150mm	5
Max		145 mm	>150mm	0
Other species: <i>Patiria miniata</i> (10)				



23 January, 2005. Crook Point. Low tide -0.7 at 1533 hrs. Weather was sunny, comfortably warm, calm, with a moderate ocean surge. Water temperature was 14°C. Only one western gull and one black oystercatcher were seen at the site. Elephant seals were hauled out on the beaches on either side of the site and were seen in the water, but they did not visit us. We were on site from 1130 to 1630 hrs. We left at 1630 because I wanted to be sure we were not hiking off trail after dark.

I took a new GPS reading for the site, as the one in our computer file seemed to be inaccurate. The correct coordinates are 34.01.316N, 120.22.743W. The trailhead at the top of the hill is 34.01.426N, 120.22.534W.

We started finding plots and taking photos on the inner reef while the tide ebbed, then moved to the outer reef. Then I scored 12 of the 20 plots with Ann recording while Santiago counted and measured seastars. He found 68 stars (18 orange, 50 brown) and 3 black abalone in 90 minutes of searching both outer and inner reef. In fall 2003 the seastar count was 121; in spring 2004 it was down to 56. The thermograph housing was very difficult to open, but Santiago finally got it. I downloaded the Tidbit successfully on the third try. I made repairs to plot corners. The upper left of 387 was its only visible corner, and since I did not know the proper orientation I did not put in new corners for this plot. I took several different photos to match to a previous picture later.

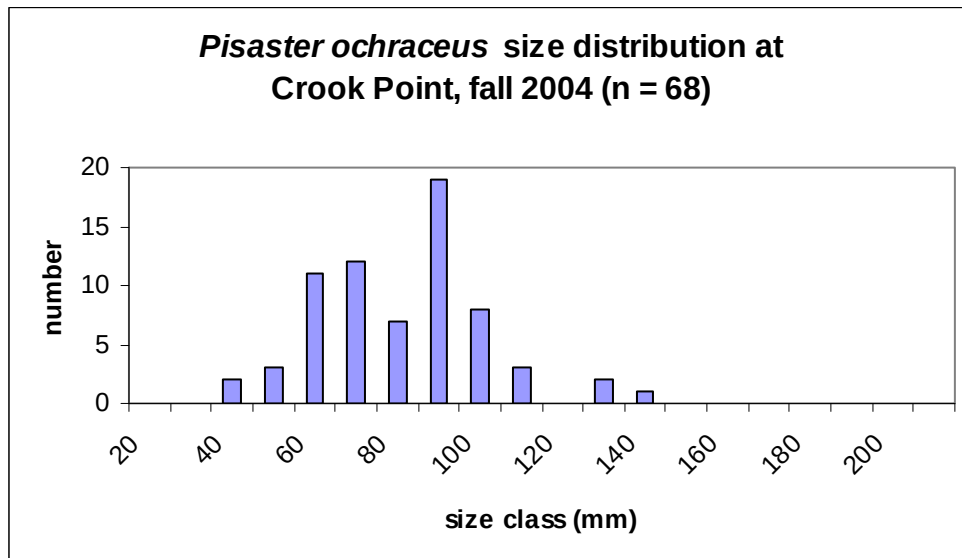
Overall, the site seemed similar to last May. The mussels were thick. I scraped lots of barnacles off the plot corners. *Ulva* still covers much of the area on the outer reef. Rockweed in the plots was a bit thicker, but still short. Some very young, short rockweed was seen in the plots.

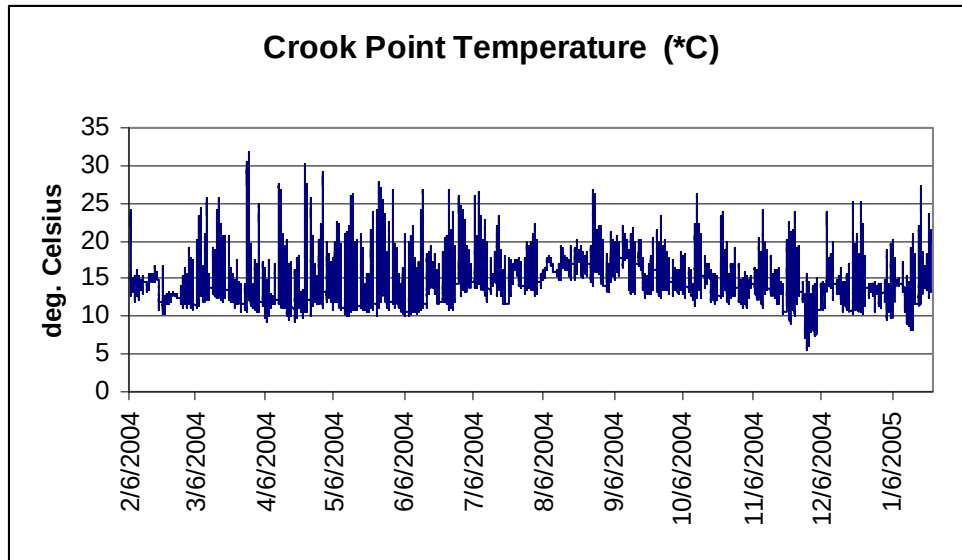
Photoplot summary – mean percent cover by zone at Crook Point, San Miguel Island, fall 2004 (5 plots/zone)

Zone Name	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc. Algae	Misc. Animal	Tar
Barnacle	45.2	49.0	0.0	4.2	0.0	0.0	0.8	0.0	0.0	0.2	0.6	0.0
Endocladia	25.0	16.8	0.6	23.2	8.4	0.2	9.6	0.0	1.2	14.4	0.6	0.0
Rockweed	26.0	13.4	0.2	14.4	2.4	2.0	26.6	1.8	1.2	11.4	0.6	0.0
Mussels	9.0	2.0	0.0	0.0	0.0	0.0	74.8	0.0	1.0	13.2	0.0	0.0

Seastar (*Pisaster ochraceus*) counts at Crook Point, San Miguel Island, fall 2004

Total	68	radius	brown/purple	orange
Mean	77 mm	<75mm	23	9
Min	35 mm	75-150mm	27	9
Max	133 mm	>150mm	0	0





24 January, 2005. Cuyler Harbor. Low tide -0.7 at 1601 hrs. There was no wind to speak of, ocean swell was light, and it was sunny with a comfortable temperature. Water temperature was 16°C. One black oystercatcher was on site, and 2 male elephant seals swam by. We were on site from 1200 to 1630 hrs. As the water was still too high to expose most of the plots, I started scoring the upper plots with the help of Ann as recorder. Santiago took the map and located the other plots as the water receded. I started taking photos at about 1400 hrs with the assistance of Ann and Santiago, then went back to scoring. All plots were field scored. Santiago counted and measured seastars. Over a period of about 75 minutes, he found 141 stars; 37 were orange, 104 brown. All were in the immediate area of the site. This is an increase over the 95 found (in a 30 minute search) last spring. I made repairs to plot markers. 401 and 402 in particular were well obscured by *Phragmatopoma* and *Mytilus*. The photos of *Mytilus* plots came in handy, as only the upper left corner of 401 was visible. After matching the quadrat placement with the photo, I was able to find the other corners under the thick growth of organisms.

Recruitment was apparent in *Mytilus*, *Endocladia* and barnacles, as I scraped a lot of that off the plot markers! There are still many big *Mytilus*, but quite a few very small ones too. *Silvetia* was fairly short but healthy. Surfgrass looked healthy with little bleaching, and the low zone algae was dense and diverse. *Phragmatopoma* has infiltrated more of the site area; ten of our plots scored at least one point of it. The wall of the surge channel opposite our site is covered with *Phragmatopoma* (see photo 027). There was quite a bit of sand and broken shell caught in the *Endocladia*.

There were about 50 elephant seals on the east end of Cuyler Beach, and we witnessed a classic display of male territoriality as we started up towards the site. Two male seals approached each other in the middle of the group of females and pups, and with great swings of their heads and loud bellowing went at each other, eventually ending up in the water. The loser swam away towards the other lonely bachelors down the beach, the winner returned triumphantly to his harem.

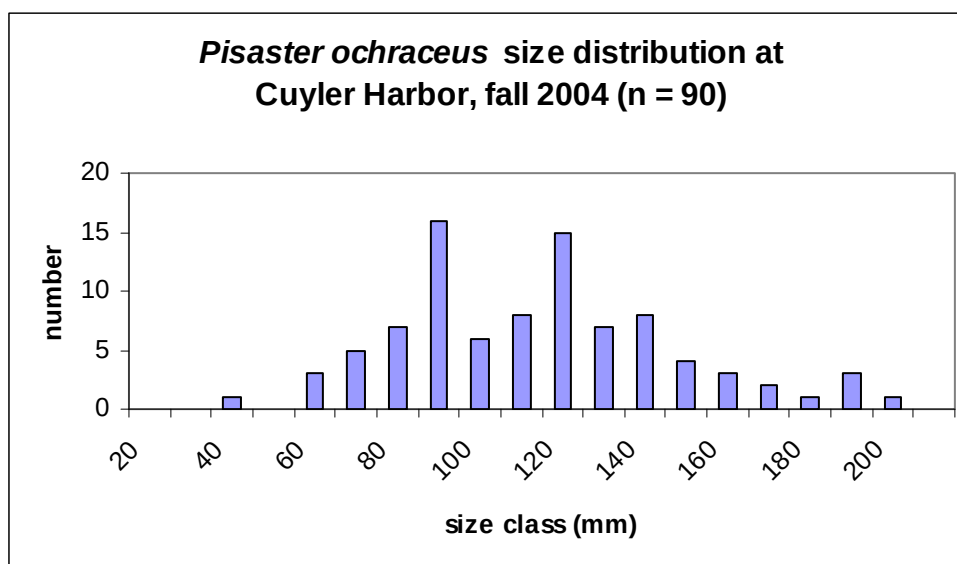
A few days ago, the rock outcropping towards the eastern side of the beach was impassable because of beach scouring, even at low tide. As we walked back this day we saw that the surge channels were filled with sand so that only the top one or two feet of rock was visible. This was a big change in a short time.

Photoplot summary – mean percent cover by zone at Cuyler Harbor, San Miguel Island, fall 2004 (5 plots/zone)

<i>Zone Name</i>	<i>Bare Rock</i>	<i>Barnacle</i>	<i>Tetra- clita</i>	<i>Endo- cladia</i>	<i>Hespero- phycus</i>	<i>Silvetia</i>	<i>Mussels</i>	<i>Turf- weed</i>	<i>Leaf Barnacle</i>	<i>Misc. Algae</i>	<i>Misc. Animal</i>	<i>Tar</i>
Barnacle	24.6	50.4	0.0	24.2	0.0	0.4	0.0	0.0	0.0	0.2	0.2	0.0
Endocladia	20.0	11.0	0.8	38.6	0.0	9.6	7.6	1.2	0.0	10.0	1.2	0.0
Rockweed	14.0	0.2	1.8	1.2	0.0	69.8	0.4	0.0	0.0	9.4	3.2	0.0
Mussels	12.6	0.2	6.6	0.0	0.0	0.0	66.4	0.8	2.8	2.2	8.4	0.0

Seastar counts (*Pisaster ochraceus*) at Cuyler Harbor, San Miguel, fall 2004
Total count includes additional 51 stars not measured (total star count=141)

<i>total</i>	<i>90</i>	<i>radius</i>	<i>brown/purple</i>	<i>Orange</i>
mean	110 mm	<75mm	23	6
min	39 mm	75-150mm	67	26
max	191 mm	>150mm	14	5
Other species: <i>Patiria miniata</i> (1)				



Anacapa Island January 23-24, 2005

(Database event #2004-K)

PERSONNEL: Dan Richards, Marine Biologist, Channel Islands National Park
Laura Francis, Channel Islands National Marine Sanctuary
Jessie Altstatt, Santa Barbara Channel Keepers
Paula Power, Wildlife Biologist, Channel Islands National Park
David Kushner, Marine Biologist, Channel Islands National Park
Rocky Rudolph, SCA Intern, Channel Islands National Park
Steve Koch, VIP
Lourdes Koch, VIP
Luman Moody, R/V *Shearwater* Captain
Charlie Lara, R/V *Shearwater* deckhand

PROCEDURE and general observations: Day trips were run each day from Ventura using the Marine Sanctuary Vessel R/V *Shearwater*. On Sunday 1/23 we went to Frenchy's Cove. We made a dive on the eelgrass restoration site before going ashore. Also along were Paula's two kids and eight students from Clovis with two teachers and two parents involved in the LiMPETS (Long-term Monitoring and Experimental Training Program for Students) program. At each site, we shot the digital photos, with an Olympus 5050 digital camera. Photoplots were not scored in the field. Seastars and abalone were counted within the defined areas of the reef. Motile invertebrates were counted in all photoplots. The maximum number of shorebirds and pinnipeds seen at any one time was recorded.

23 January 2005, South Frenchy's Cove. Low tide -0.6 ft at 1525 hrs, excellent weather with partly cloudy sky, light variable wind, but moderate swell. Water temperature was 15.5°C. On the north side of the island, we saw four Black Oystercatchers. Brown Pelicans had established nests on ridge to the west of Frenchy's. No shorebirds were seen on the south side, one harbor seal watched us from the water. We were on site from about 1300 to 1700hrs.

We dove at the eelgrass restoration site in Frenchy's Cove. There were several eelgrass patches, ranging from individual plants to about 5x5m. The grass all looked very healthy. *Ophiothrix spiculata* (brittlestar) numbers were much lower than last year. *Sargassum muticum* was common, growing on cobblestones and often over 1m long.

The beach was very steep from the recent high swells and was littered with woody debris (*Arundo donax* and *Salix* sp. mostly) washed out the rivers by the storms earlier in the month. Some of the cane sticks were coated in tar and there were some fresh oil globs on the rocks. Plastic debris, from straws to a car bumper, was also common on the beach. We collected a fish acoustic monitor belonging to the PIER group to return to them. There were several large logs including some entire willow trees. The south side beach has some wood and tar but not as much. No dead or oiled animals were found. *Ligia occidentalis* were abundant on the beach at North Frenchy's.

Jessie counted motile invertebrates in the upper zones. I counted motile invertebrates in the outer reef plots. Laura shot the photos. Paula and her kids recorded data and searched for seastars.

Laura and Jessie measured *Lottia gigantea* in the three plots. I removed the temperature logger about 1620 hrs. to download in the office.

No seastars or abalone were seen on the monitoring reef. Several *Pisaster ochraceus* and one black abalone were found on the reef to the west, however. *Mytilus californianus* were fairly dense, covering a number of the plot corners. Mussel recruitment appeared to be high and the population was doing well though is generally restricted to a small area at this site. *Silvetia* was doing very well as was *Endocladia*. *Hesperophycus* was present and looked fine for what was there. *Sargassum muticum* and *Jania crassa* were common in the tide pool surrounded by *Enteromorpha* sp.

Nucella emarginata were abundant in the mussel plots. *Acanthina* sp. were present in the mussel plots and common in most of the upper zones. *Littorina* spp were surprisingly not very common.

For some reason, plot 255 (Endocladia zone) was not recorded in the camera, so we will not have a cover score for it. Sometimes with the camera in the housing, it is difficult to be sure the shutter clicked and photo recorded.

Photoplot summary – mean percent cover by zone at South Frenchy's Cove, Anacapa Island, fall 2004 (5 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other
Barnacle	30.6	45.8	0.0	17.0	5.4	0.0	0.0	0.0	0.0	1.0	0.0	0.2	0.0
Endocladia	13.8	2.4	0.0	49.8	0.6	11.0	0.2	0.0	0.0	2.2	0.0	0.0	0.0
Rockweed	27.2	5.8	0.0	8.6	0.0	52.2	0.2	0.2	0.0	5.4	0.0	0.0	0.4
Mussels	2.6	2.8	0.0	0.0	0.0	0.0	89.0	0.4	0.0	5.2	0.0	0.0	0.0

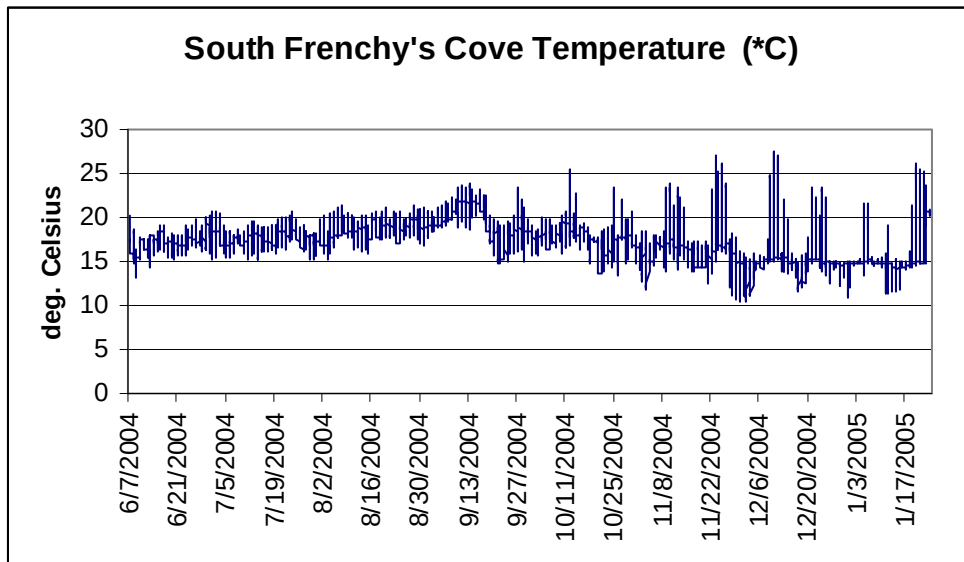
***Lottia gigantea* at South Frenchy's Cove, Anacapa Island, fall 2004**

Plot	Count	Area	Density	CountSized	MeanSize	StDev	MinSize	MaxSize
1	13	3.14	4.139	13	39.23	15.64	18	59
2	20	3.14	6.367	20	32.70	10.77	15	50
3	10	3.14	3.184	10	45.60	12.48	20	61

Motile invertebrate counts and size frequency measurements at South Frenchy's Cove, Anacapa Island, fall 2004

	<i>Nucella emarginata</i>	<i>Acanthina</i> spp.	<i>Ocenebra circumtexta</i>
Mean size (mm)	17	15	9
Std Dev (mm)	4	2	4
Min size (mm)	8	10	6
Max size (mm)	24	19	15
Count	49	37	7

ANSFC fall 2004																					
Zone		Barnacle					Endocladia					Silvetia					Mytilus				
plot #	total	249	250	251	252	253	154	155	256	257	258	259	260	261	262	263	201	202	264	265	266
Lepidochitona spp.	5												2	1			2				
Nuttalina spp.	15											2	1				5	3	2	1	1
Fissurella volcano	4												1					1	2		
Pachygrapsus	26			1			2	3	1	2		3	1		3		1	2	2	5	
Pagurus spp.	1												1								
large limpets(>15mm)	12			1					1			1	2	1		6					
S. purpuratus	0																				
Amphissa versicolor	0																				
Nucella emarginata	54			2												1	9	10	16	10	6
Acanthina spp.	37			2		6				1		8		4	2	1	2	2	2	1	6
Tegula funebris	0																				
Ceratostoma nuttali	0																				
Ocenebra circumtexta	7					1							1	2					2	1	
Lottia gigantea	0																				
Conus californicus	1												1								
Littorina spp.	1614	272	306	322	322	253	69	34	2	0	0	1	19	0	14	0	0	0	0	0	0
subsample 1		24	30	42	12	27	9	10					6	0							
subsample 2		51	49	33	65	17	9	1					0	0							
subsample 3		12	19	28	26	37	4	0					0	0							
Limpet < 5 mm	83	9	0	9	13	0	22	0	1	0	0	3	0	16	9	1	0	0	0	0	0
subsample 1		1	0	0	2		3						0	2							
subsample 2		0	0	3	2		0						0	0							
subsample 3		2	0	0	0		4						0	3							
Limpet 5-15 mm	368	6	3	19	44	16	6	3	4	3	4	7	22	19	27	21	31	23	32	40	39
subsample 1		0	1	3	5	1	1						3	0							
subsample 2		1	0	3	1	2	1						3	1							
subsample 3		1	0	0	8	2	0						1	5							



24 January 2005, Cat Rock. Low tide -0.7 ft at 1553 hrs, excellent weather with partly cloudy sky, light variable wind, and light swell. There were four Black Oystercatchers and two Western Gulls at the site. Harbor seals were seen offshore but not close by. We were able to land at the site and worked there from about 1200-1730 hrs.

There was only a small amount of debris and fresh tar on the south side of West Anacapa. The amount of tar on the rocks appeared to be normal. Fresh tar was only observed in one plot (19).

David counted motile invertebrates in the upper three zones with rocky recording then they measured *Lottia gigantea* in the three plots. I shot the photos then counted motile invertebrates in the mussel plots. I raced down to Frenchy's to replace the temperature logger about 1600hrs, and then returned to make plot repairs and fill out the field log. Steve searched for seastars and found three in the area. David spotted the only two abalone in the crevices just inside of the mussel plots.

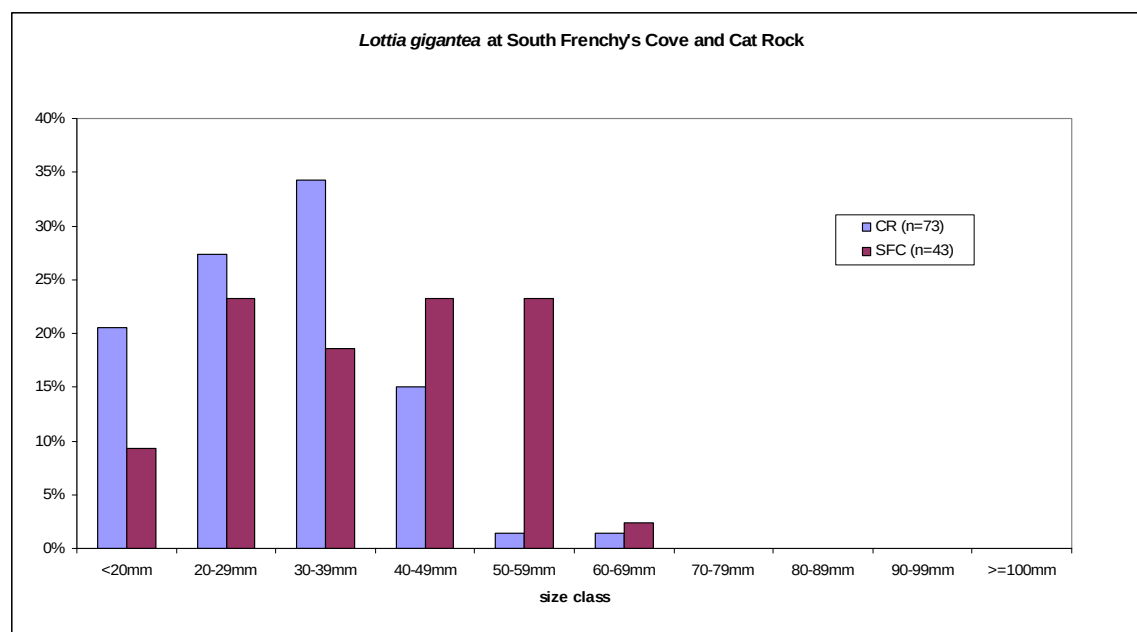
Both *Hesperophycus* and *Silvetia* were lush and extensive. *Endocladia* was also doing well. Barnacles were quite extensive and dense in areas of the upper reef. *Mytilus californianus* were doing well but did not seem as dense with young mussels as at Frenchy's. *Septifer/Brachydontes* seemed to be abundant in the mussel beds. *Ocenebra circumtexta* were abundant in the mussel plots. *Nuttalina* sp. were also abundant. *Acanthina* sp. were common in the upper zone plots. *Tegula gallina* were present in some of the higher tidepools but were not found in any plots. No *T. funebris* were seen. *Ligia occidentalis* were present on the gravel beaches but were not as abundant as at North Frenchy's.

Photoplot summary – mean percent cover by zone at Cat Rock, Anacapa Island, fall 2004 (9 plots/zone)

Zone	Bare Rock	Barnacle	Tetra-clita	Endo-cladia	Hespero-phycus	Silvetia	Mussels	Turf-weed	Leaf Barnacle	Misc Algae	Misc Animal	Tar	Other
Barnacle	31.4	21.1	0.0	8.1	34.8	2.8	0.0	0.0	0.0	1.8	0.0	0.0	0.0
Endocladia	14.6	18.0	4.3	35.7	3.3	3.3	4.3	6.9	0.0	9.2	0.0	0.0	0.3
Rockweed	12.6	6.9	1.0	13.4	6.9	53.3	0.9	0.0	0.0	4.9	0.1	0.0	0.0
Mussels	13.3	11.7	9.1	2.4	0.0	0.0	46.0	0.1	0.6	15.6	1.2	0.0	0.0

***Lottia gigantea* plot data at Cat Rock, Anacapa Island, fall 2004**

Plot	Count	Area	Density	CountSized	MeanSize	StDev	MinSize	MaxSize
1	49	3.14	15.600	49	26.37	8.99	14	49
2	21	3.14	6.686	21	37.62	7.82	19	55
3	3	3.14	.955	3	33.67	26.65	14	64



**Motile invertebrate counts and size frequency measurements at Cat Rock,
Anacapa Island, fall 2004**

	<i>Acanthina</i> <i>spp.</i>	<i>Ocenebra circumtexta</i>	<i>Lottia gigantea</i>
Mean size (mm)	14	12	29
Std Dev (mm)	2	2	10
Min size (mm)	7	6	10
Max size (mm)	19	17	57
count	56	72	38

<i>Zone</i>	<i>total</i>	<i>Barnacle</i>										<i>Endocladia</i>								
<u>plot #</u>		<u>33</u>	<u>37</u>	<u>135/34</u>	<u>31</u>	<u>35</u>	<u>38</u>	<u>32</u>	<u>36</u>	<u>39</u>	<u>212</u>	<u>14</u>	<u>51/18</u>	<u>54</u>	<u>13</u>	<u>467/17</u>	<u>52</u>	<u>53</u>	<u>19</u>	
Lepidochitona spp.	83	1	2								1	4	1		2			3		
Nuttalina spp.	406	2	1			1	1		1	2	4	25	11	23	11	25	17	6		
Fissurella volcano	29																			
Pachygrapsus	77	7	1	1		3			2		2			1	1		2	3	1	
Pagurus spp.	0																			
large limpets(>15mm)	47	3	2				4		1		1	4	1	2		2	2		2	
S. purpuratus	0																			
Amphissa versicolor	0																			
Nucella emarginata	0																			
Acanthina spp.	56	4	5	3	4	6			7	1									3	
Tegula funebris	0																			
Ceratostoma nuttali	0																			
Ocenebra circumtexta	88										1	5			1	2	1			
Lottia gigantea	38											4			2	2		2		
Littorina spp.	3930	12	36	388	1138	63	638	88	34	888	1	4	1	0	32	1	0	4	0	
subsample 1				49	16		8	7		41										
subsample 2				62	15		35	20		30										
subsample 3				13	60		8	1		0										
Limpet < 5 mm	605	17	24	10	6	9	18	2	30	8	34	32	45	41	37	18	26	29	13	
Limpet 5-15 mm	435	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

zone	Silvetia										Mytilus								
plot #	2	55/7	9	3	5	6	4	8	10	56	471	164	470	204	468	203	473	472	
Lepidochitona spp.		10		2	1		1			11	4	4	9		7	10	6	4	
Nuttalina spp.		5	1		4				2	41	26	23	32	11	68	24	14	25	
Fissurella volcano										5	3	4	2	2	2	2	3	6	
Pachygrapsus	1	1	4	2		3	1	3	2	10	3	4	1		2	8	4	4	
Pagurus spp.																			
large limpets(>15mm)				2	1	1	3	7	3	1		3				1	1		
S. purpuratus																			
Amphissa versicolor																			
Nucella emarginata																			
Acanthina spp.	1			4	8		7	1	2										
Tegula funebris																			
Ceratostoma nuttali																			

Ocenebra circumtexta		1			1					13	8	16	9	8	2	9	7	4
Lottia gigantea										3		4	10	1	5	2	2	1
Littorina spp.	8	109	1	20	1	1	3	3	3	24	14	9	3	0	0	9	76	0
4				3	3	6	7											
subsample 1		13		11														
subsample 2		13		28														
subsample 3		9		26														
Limpet < 5 mm	1	52	4	23	3	2	1	1	12	0	0	0	0	0	0	0	0	0
8					8	9	5	5										
subsample 1																		
subsample 2																		
subsample 3																		
Limpet 5-15 mm	0	0	0	0	0	0	0	0	0	55	69	35	61	25	50	33	39	68