

# KELP FOREST MONITORING ANNUAL REPORT 2004



**CHANNEL ISLANDS NATIONAL PARK**



**National Park Service  
Channel Islands National Park**

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**KELP FOREST MONITORING  
2004 ANNUAL REPORT**

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## Table of Contents

ABSTRACT .....	3
EXECUTIVE SUMMARY .....	4
INTRODUCTION.....	6
METHODS.....	7
STATION RESULTS.....	8
Location: Wyckoff Ledge, San Miguel Island .....	10
Location: Hare Rock, San Miguel Island .....	11
Location: Miracle Mile, San Miguel Island.....	13
Location: Johnson's Lee North, Santa Rosa Island .....	14
Location: Johnson's Lee South, Santa Rosa Island .....	16
Location: Rodes Reef, Santa Rosa Island .....	18
Location: Gull Island, Santa Cruz Island .....	20
Location: Fry's Harbor, Santa Cruz Island .....	22
Location: Pelican Bay, Santa Cruz Island.....	24
Location: Scorpion's Anchorage, Santa Cruz Island.....	25
Location: Yellow Banks, Santa Cruz Island .....	27
Location: Admiral's Reef, Anacapa Island .....	29
Location: Cathedral Cove, Anacapa Island.....	31
Location: Landing Cove, Anacapa Island.....	33
Location: Southeast Sea Lion, Santa Barbara Island .....	35
Location: Arch Point, Santa Barbara Island .....	36
Location: Cat Canyon, Santa Barbara Island.....	38
Location: Northwest Harbor, San Clemente Island.....	39
Location: Boy Scout Camp, San Clemente Island .....	40
Location: Eel Point, San Clemente Island.....	41
Location: Horse Beach Cove, San Clemente Island.....	43
Survey Dives:.....	44
Location: Wilson Cove, San Clemente Island .....	44
Location: Pyramid region, San Clemente Island .....	44
Location: Webster Point, Santa Barbara Island .....	44
DISCUSSION .....	46
ACKNOWLEDGEMENTS .....	54
LITERATURE CITED.....	55

## List of Tables

<b>Table 1:</b> Regularly monitored species by taxonomic grouping, common name, scientific name and associated monitoring technique. ....	57
<b>Table 2:</b> Station Information. ....	59
<b>Table 3:</b> Summary of sampling techniques used to monitor population dynamics of selected kelp forest taxa. ....	60
<b>Table 4:</b> 2004 Kelp forest monitoring site status, with 2003 status for comparison.....	61
<b>Table 5:</b> 2004 Kelp Forest Monitoring Program participant and cruise list.....	63
<b>Table 6:</b> 2004 Echinoderm wasting disease/syndrome observations. ....	64

## List of Figures

<b>Figure 1:</b> Kelp Forest Monitoring Locations at Channel Islands National Park.....	65
<b>Figure 2:</b> Kelp Forest Monitoring Locations at San Clemente Island. ....	66

## Appendices

Appendix A. Quadrat Data	A1
Appendix B. 5m <sup>2</sup> -Quadrat Data	B1
Appendix C. Band Transect Data	C1
Appendix D. Random Point Contact Data	D1
Appendix E. Fish Transect Data	E1
Appendix F. Roving Diver Fish Count Data	F1
Appendix G. Natural Habitat Size Frequency Distributions	G1
Appendix H. <i>Macrocystis pyrifera</i> Size Frequency Distributions	H1
Appendix I. Gorgonian/ <i>Stylaster (Allopora) californica</i> Size Frequency Distributions	I1
Appendix J. Artificial Recruitment Modules Size Frequency Distributions	J1
Appendix K. 2004 Species Lists for all Kelp Forest Monitoring Sites	K1
Appendix L. 2004 Temperature Data collected at Kelp Forest Monitoring Sites by Remote Loggers	L1

## ABSTRACT

Observations and results of the 2004 Channel Islands National Park, Kelp Forest Monitoring Project are described. Population dynamics of 70 taxa, or categories, of algae, fish and invertebrates were measured at the 16 original KFM sites at the five Park Islands, one additional site on San Miguel and four sites at San Clemente Island. Survey techniques utilized SCUBA and surface-supplied-air, and included quadrats, 5m<sup>2</sup>-quadrats, band transects, random point contacts, fish transects, roving diver fish counts, video transects, size frequency measurements, artificial recruitment modules, and species list surveys. Temperature data were collected using remote temperature loggers. In 2004 at the original 16 sites, nine sites had mature *Macrocystis pyrifera* (giant kelp) forests, six sites were dominated by echinoderms and one site was in a state of transition. Of the six sites dominated by echinoderms, two were dominated by *Strongylocentrotus purpuratus* (purple sea urchins), two by *S. purpuratus* and *Strongylocentrotus franciscanus* (red sea urchins), one by *Ophiothrix spiculata* (brittle stars), *S. purpuratus* and *S. franciscanus*, and one by *O. spiculata* and *S. purpuratus*. In addition to the 16 original KFM sites, the Miracle Mile site at San Miguel Island was a mature kelp forest and all four of the new sites at San Clemente Island were mature kelp forests. All of the proposed monitoring in 2004 was completed.

## EXECUTIVE SUMMARY

Channel Islands National Park has conducted long-term ecological monitoring of the kelp forests around Santa Barbara, Anacapa, Santa Cruz, Santa Rosa, and San Miguel Islands since 1982. Permanent transects were established at 16 sites between 1981 and 1986. An additional site, Miracle Mile, was established at San Miguel Island in 2001 by a commercial fisherman with assistance from the Park. In 2003, four sites were established and sampled at San Clemente Island, Naval Auxiliary Landing Field, under a contract with the U.S. Navy. The results of the sampling effort at San Clemente Island are included in this report, and are also supplied to the Navy in a separate report. Sites were monitored during seven five day cruises and one eight day cruise between June and October. The 2004 kelp forest monitoring was completed at all 21 monitoring sites by 21 National Park Service (NPS), and volunteer divers completing a total of 789 dives with 735 hours of bottom time. Divers using SCUBA or surface-supplied-air completed all 1m<sup>2</sup> quadrats, 5m<sup>2</sup>-quadrats, band transects, random point contacts, fish transects, roving diver fish counts, size frequencies, artificial recruitment modules (ARMs), video transects and temperature loggers were retrieved and deployed. This annual report contains a summary of the methods used to conduct the monitoring in 2004 and a brief description of the sites along with the results. All of the data collected during 2004 can be found summarized in the Appendices.

At Santa Barbara Island, the kelp forests have decreased in abundance and size since 2003. This is opposite of the other Park Islands where kelp forests continued to expand or are becoming denser. All three monitoring sites at Santa Barbara Island, which had some degree of developing kelp forests in 2003, were dominated by echinoderms this year. Most notable was the reverse of the recent rapid decline in sea urchin densities, and 2004 marked a dramatic increase of both *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* at all three sites. Corresponding to the increase in *Strongylocentrotus spp.* a decrease in macroalgae abundance occurred and with that our recent hopes of kelp forests returning to these sites in the near future. Similar to 2002, all three sites are again nearly devoid of macroalgae. All three sites were dominated by *S. purpuratus* and *S. franciscanus* and Southeast Sea Lion continued to have an abundance of *Ophiothrix spiculata* which also dominated much of this site. Overall, we feel that these three sites represent Santa Barbara Island well. It appears that most of the island is dominated by the three species of echinoderms that dominate the three monitoring sites. Similar to recent years, the only canopy forming kelp forests around the Island were near shore around Sutil Island and close to the shallow areas predominantly on the west side of the Island. In addition, the reef about a quarter of a mile east of Arch Point also appears to be a developing kelp forest.

The three KFM sites at Anacapa Island have changed little from last year and appear to represent the island well. Overall, there was noticeably more *Macrocystis pyrifera* than last year. *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* densities remained similar or declined slightly at all three sites. Admiral's Reef remains dominated by *Ophiothrix spiculata* and continues to have a low abundance of algae. Algae abundance notably increased at Cathedral Cove and Landing Cove compared to the past few years. There were notably more algae in other inshore areas around Anacapa this year. However, *S. purpuratus* and *O. spiculata* still appear to dominate many areas along the south side of East Anacapa, and both the south and north sides of middle and West Anacapa Island. Unlike Santa Barbara Island, we did not observe the dramatic increases in *Strongylocentrotus spp.* abundance at Anacapa Island.

The *Macrocystis pyrifera* forests at Santa Cruz Island continue to expand. *Strongylocentrotus spp.* densities have decreased over the past several years and continued to do so this year, but at a slower rate. *Strongylocentrotus purpuratus* densities continued to decline at three sites and remained the same at the two sites where they have recently become relatively rare. *Strongylocentrotus franciscanus* densities remained about the same at all five monitoring sites this year. In 2004, two of the sites were dominated by echinoderms (both by *Strongylocentrotus purpuratus*), one less than in 2003. Gull Island South remained a mature kelp forest and Yellow Banks has transitioned to a kelp forest. Echinoderms have greatly decreased at Fry's Harbor, and this site appears to be in a state of transition, possibly to kelp forest. Scorpion Anchorage and Pelican Bay both remain dominated by *S. purpuratus*, though their densities are much lower than in recent years. The western third of Santa Cruz Island is under represented by our monitoring program as we don't have any sites west of Gull Island South. However, the kelp forests on that end of the Island appear to be increasing as there has been a notable increase in *M. pyrifera* canopy cover over the past several years.

Kelp forests continued to be abundant and dense around Santa Rosa and San Miguel Islands. In 2004 mature kelp forests were present at all five of the original kelp forest monitoring sites at these two Islands, compared to four in 2003. In addition, the relatively new monitoring site, Miracle Mile remained a mature kelp forest. Similar to what has been observed at many of the other Islands, *Strongylocentrotus spp.* densities ceased their decline over the past several years. *Strongylocentrotus purpuratus* densities increased at two sites and remained about the same at three. *Strongylocentrotus franciscanus* densities increased at one site, decreased at one site, and remained about the same at three sites.

This is the second year we have conducted kelp forest monitoring at San Clemente Island as part of an agreement with the U.S. Navy. Future monitoring at San Clemente Island will be contingent upon additional funding from the Navy. In 2004, the four monitoring sites at San Clemente Island all remained mature kelp forests. Similar to last year, there was an abundance of kelp forest around the entire Island and the canopy was notably thicker than in 2003. There were no outstanding changes at the four monitoring sites this year. We observed more juvenile *Paralabrax clathratus* at San Clemente this year, and presume that these recruited out later on in the summer of 2003.

## INTRODUCTION

The waters of Channel Islands National Park and Channel Islands National Marine Sanctuary contain one-third of southern California's kelp forests (Davies, 1968). Giant kelp, *Macrocystis pyrifera*, is the primary constituent of a southern California kelp forest, and over 1,000 species of macro flora and fauna live in this community (Woodhouse 1981, Engle pers. comm.). The kelp forest serves as food, shelter, substrate and a nursery to resident as well as migratory species. Many species, while not residents of the kelp forest, are dependent upon the existence and productivity of kelp forests; detrital flux from kelp forests provides an important source of nutrients to nearby rocky shore, sandy beach, and estuary communities. The kelp forests are essential to California's commercial and sport fisheries as well as the recreation and tourist industries.

Channel Islands National Park consists of five of the eight California Channel Islands (San Miguel, Santa Rosa, Santa Cruz, Anacapa, and Santa Barbara) and the submerged lands and waters within one nautical mile of each of the islands. The Channel Islands National Marine Sanctuary overlaps the subtidal portions of the park, and its boundary extends six miles seaward from the Park Islands. Channel Islands National Park also bears the designation of International Biosphere Reserve and State of California Area of Special Biological Significance. The State of California maintains jurisdiction over the resources within the Park and manages them through the California Department of Fish and Game.

San Clemente Island is the southernmost of the eight California Channel Islands. The waters surrounding the Island out to 300 meters have been under exclusive management by the U.S. Navy since the 1920s. The State of California owns and manages the living marine resources out to three miles offshore. Management of these marine resources is conducted by the California Department of Fish and Game.

The Kelp Forest Monitoring project is part of the long-term ecological monitoring program at the Park, which is designed to measure the health of the ecosystems. By determining the limits of normal variation and diagnosing abnormal conditions we hope to prescribe remedial action through management recommendations.

Following a five-year design study that began in 1982, the Kelp Forest Monitoring Program was implemented in 1987 by the Park's resource management division, using the protocol established during the design phase (Davis and Halvorson, 1988). Preliminary results and specific design considerations can be found in reports written by Davis (1985, 1986). Richards et al. (1997), describe monitoring efforts and results for 1982-1989. Richards et al. (1993a), Richards et al. (1993b), Richards and Kushner (1994), Kushner et al. (1995a), Kushner et al., (1995b), Kushner et al. (1997a), Kushner et al. (1997b), Kushner et al. (1998), Kushner et al. (2000), Kushner et al. (2001), Kushner et al. (2004), Kushner et al. (2006), and Kushner et al. (2006) describe the 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002 and 2003 monitoring efforts and results respectively. A review of the Kelp Forest Monitoring Program was conducted in 1995 (Davis et al., 1996).

This report summarizes the monitoring efforts and results from 2004, our 23rd year of monitoring. It is hoped that these reports will provide some insight into kelp forest dynamics and stimulate further research into the long-term trends and changes in this near-shore ecosystem. We have highlighted some of the most important observations, and provided a characterization for each site. Organisms are referred to by genus and species, except in the abstract and executive summary where both scientific and common names are used. Common names are cross-referenced to their scientific names in Table 1. Since the design of the kelp forest monitoring project, several genera and species names have been changed. For the most part, the new and the old genus are listed together in this text. The new names are cross-referenced in Table 1.

## METHODS

Abundances, and in some cases size structure, of 68 taxa or categories of algae, fish, and invertebrates (Table 1) were measured at 21 permanent sites (Table 2) around the five Park islands (Figure 1) and 4 permanent sites around San Clemente Island (Figure 2). Site and species selection criteria, and sampling protocol are described in the Kelp Forest Monitoring Handbook (Davis et al., 1997). Sites were monitored between June 7<sup>th</sup> and October 1<sup>st</sup> 2003, using the NPS vessel Pacific Ranger.

Each site is marked by a 100 m long transect affixed to the seabed. The sampling techniques employed to gather patterns of abundance and age structure are summarized in Table 3. To determine densities and distributions of discrete benthic organisms at each station, 24 paired 1 m x 1 m quadrats were systematically arranged along the transect with a random start, 40 continuous and adjacent 1 m x 5 m quadrats, and 24 paired 3 m x 10 m band transects were systematically arranged along the transect with a random start. To determine percent cover of encrusting invertebrates, algae, and substrate composition 600 random non-adjacent points (random point contacts - RPCs) were used; four 2 m x 3 m x 50 m fixed transects were used to determine fish abundance; roving diver fish counts with a time component and estimated abundance were used to determine an index of abundance and diversity; video taped transects provide a record of the site appearance; and size frequency measurements were collected to determine age structure and recruitment cohorts. All animals measured for the natural size frequency distributions were located using a band transect type search method. A general species list was established for each site, noting presence and absence and relative abundance for all recognizable species. Artificial recruitment modules (ARMs) were in place at ten of the sites to measure recruitment and population structure of indicator species within the ARMs. A complete description of the monitoring protocols can be found in Davis et. al, 1997.

Two TIDBIT<sup>TM</sup> temperature loggers were deployed at each site. Loggers were encased in underwater housings and attached to stainless steel thread rods cemented to the bottom at each site. TIDBIT<sup>TM</sup> loggers were factory serviced and calibrated and new O-rings were installed in each underwater logger housing in 2004. A comparison of several temperatures from both loggers was made to see if the loggers were recording within factory specifications ( $\pm 0.2$  °C).

This year, as with previous years, sampling at the Park monitoring sites typically occurred over at least two separate dates, ranging from two weeks to several months apart. Separate sampling dates enabled us to conduct fish transects and roving diver fish counts two times at each site at least two weeks apart. During our first visit we attempt to conduct all of the abundance estimate techniques (quadrats, 5m<sup>2</sup>-quadrats, band transects, random point contacts, fish transects, and roving diver fish count). During the second and subsequent visits, a second set of fish transects, and roving diver fish counts, as well as any remaining size frequencies, ARMs, line repair or other work is conducted. Occasionally abundance techniques are not completed during our first visit, and are finished during our second visit and this is noted in the appropriate Location section below. If there appears to be large changes in abundance between visits within a sampling season, a second sampling may be conducted to document these changes and differences are reported in the Station Results section below. In the text we report numbers to two significant digits.

## STATION RESULTS

Sampling was completed at all 21 monitoring sites and a summary of the 2004 status of each site is presented in Table 4. Twenty-one divers (Table 5) collected data on seven five-day cruises and one eight-day cruise between June and October. A total of 789 dives with over 735 hours of bottom time were completed. All prescribed monitoring data were collected in 2004.

A brief description of each site is included with the station results below. Complete data summarized from the sampling protocol are listed in the appendices. Means for quadrats (Appendix A) represent average counts obtained from 24 paired 1 m x 1 m quadrats systematically arranged along the transect with a random start. Means for 5m<sup>2</sup>-quadrats (Appendix B) represent average counts obtained from 40 continuous and adjacent 1 m x 5m quadrats. Note that when adult, subadult and juvenile densities for *Macrocystis pyrifera* are listed in the station descriptions, the adult and subadult densities are derived from the 5m<sup>2</sup>-quadrats, and the juvenile densities from the quadrat data unless otherwise noted.

Means for band transects (Appendix C) represent average counts obtained from 24 paired 3 m x 10 m transects systematically arranged along the transect with a random start. Means for random point contacts (Appendix D) represent average percent cover for a given organism, group of taxa, or substrate at 15 quadrats systematically arranged along the transect with a random start. Forty points from each quadrat (600 points total) are used to determine percent cover of selected organisms and substrate within one meter of the bottom. Percent cover may total more than 100% due to layering (Davis et al., 1997).

Means for fish transects (Appendix E) represent the average of four adjacent and continuous 2 m x 3 m x 50 m transects along the line. It should be noted that this is different from previous years when fish transects were 2m x 3m x 100m. Cases listed refer to the total number of passes over the transect made during sampling. All counts were conducted between 0900 and 1500 hours unless otherwise noted.

The Roving Diver Fish Count data are presented in Appendix F. The first page of this Appendix contains the number of observers that sampled and the total number of species observed for each sampling date and site. The following pages contain the average timed score, mean abundance and average count for each species observed for each sampling date and site. The following pages in Appendix F contain the average timed Score, the average Abundance score and an average Count for each sampling date and site. However, Counts were only collected by divers who we designate as "experienced" so not all divers collected Counts. As a result there could be fewer Counts than Abundance at a particular site.

In the middle of the field season in 2003 we began collecting whole fish counts as part of the Roving Diver Fish Count protocol. We decided to do this because it only takes a little extra effort underwater to keep track of whole fish counts and we were losing this information by transferring those numbers to Abundance codes (S (single) F (few) C (common) and M (many)). If an observer did not feel comfortable or we did not classify them as an expert, then only the abundance codes were used. In the case an observer was comfortable counting most fish except cryptic species like *Coryphopterus nicholsii*, then the observer uses Abundance codes for those species and for all others both Abundance codes and whole fish Counts. Where fish Counts were not present nor taken (null) an associated null value (blank) is in the data base. 2004 was the first year that all three parameters at all sites were collected during the Roving Diver Fish Count protocol.

Prior to 2003 there were two data fields collected on the roving diver fish count protocol, Score and Abundance. The Score field is a time Score assigned to each fish species that relates to when during the 30 minute count it was observed. The Abundance field is number assigned to the abundance categories: single (1 fish), few (2-10 fish), common (11-100 fish), or many (>100 fish). The Abundance field is summarized in Appendix F numerically where 1 = single, 2 = few, 3 = common and 4 = many. Beginning in 2003 a new field Count was added. The Count field is the actual whole number of fish counted by an observer during the 30 minute Roving Diver Fish Count. In the sites descriptions below we began using the whole counts in 2003 to describe the abundance of fish as it is felt they are better and more consistent at describing fish abundance than descriptive words like common or rare. However, different observers count different numbers of the same species at a site for a number of reasons. Though it is possible for an observer to count a fish more than once during a 30 minute fish

count, we have chosen to describe fish mostly using the highest number observed at a site. In the result section below we typically use the words “up to” or “as many as” XX# of fish were observed.

Natural habitat size frequency distributions for invertebrates other than gorgonians and *Stylaster (Allopora) californica* are in Appendix G. *Macrocystis pyrifera* size frequency distributions are in Appendix H. Gorgonian and *Stylaster (Allopora) californica* size frequency distributions are in Appendix I. Size frequency measurements taken from the Artificial Recruitment Modules were kept separate from the natural habitat measurements and their distributions are in Appendix J. Species lists for all locations are in Appendix K. Video transects were completed for all locations, and the videotapes are stored at the Park's headquarters in Ventura.

Temperature data were collected at 15 sites using TIDBIT™ temperature loggers. Temperature data is collected from the loggers during our regular sampling season of June - October. To expedite report writing we will present 12 months of temperature data from June 1, 2003 to May 31, 2004 (Appendix L). Temperature data were collected from 20 of the 21 sites monitoring this year, the exception being Miracle Mile where there is no logger. Two months of temperature data are missing from Johnson's Lee North because the temperature logger was stolen. For detailed explanations of the missing data, please see the station results below or Appendix L.

**Location: Wyckoff Ledge, San Miguel Island****Site #1 SMWL**

2004 sampling dates: 7/28, 9/29.

2004 status: Mature kelp forest.

This site continues to be a mature kelp forest. *Macrocystis pyrifera* canopy cover over the transect was denser than last year and continued to cover 100% of the transect. Most of the *M. pyrifera* appeared healthy and had few epiphytes on the blades. Adult, subadult and juvenile densities were all lower than last year at  $0.29/m^2$ ,  $0.0/m^2$ , and  $0.042/m^2$  respectively and had a cover of 11.7%, also a decrease. Most of the *M. pyrifera* plants were large and widely spaced, typical of a mature kelp forest. The thick canopy cover created low light conditions on the bottom and was probably the reason for a notable decrease in sub-canopy algae. Miscellaneous brown algae cover decreased to 1.0%. *Desmarestia* sp. was absent on RPCs for the first time since monitoring began in 1982 and none was observed along the transect this year. *Cystoseira* sp. was less abundant than last year with a cover of 0.33%, also the lowest recorded at this site. No *Eisenia arborea* were observed on quadrats or RPCs, but there were several plants observed on the outside edge of the kelp forest on the west end of the transect. Adult and juvenile *Pterygophora californica* were less abundant than last year with densities of  $0.17/m^2$  and  $0.042/m^2$  respectively and a cover of 0.83%, the lowest abundances recorded over the last several years. *Laminaria farlowii* were rare with none observed on quadrats or RPCs this year. The brown alga, *Dictyoneuropsis reticulata* was notably common and we counted this under the *Agarum* sp. category that was recently added to quadrats as a fill in species (species # 2015.00 for adult and 2015.50 for juveniles). Juvenile *D. reticulata* density was  $1.92/m^2$  and was mostly present on the eastern 65 meters of transect. *D. reticulata* was common last year, but not counted on quadrats. Understory red algae were relatively rare for this site with a cover of 3.5%, the lowest recorded at this site. No *Gigartina* sp. was observed on RPCs this year. Articulated coralline algae cover decreased to 6.17%. Encrusting coralline algae cover also decreased to 21.3%. Bare substrate cover was 29.0%, similar to last year.

The most common miscellaneous invertebrates on random point contacts (RPCs) were amphipod tube mats and hydroids. Cover of this category was 12.7%, higher than last year. *Diopatra ornata* cover was 9.7% similar to recent years. *Phragmatopoma californica* were noticeably more abundant than in recent years and cover was recorded at 14.2%, the highest recorded at this site since we began monitoring this species in 1985. Miscellaneous bryozoans remained relatively abundant at this site, but cover decreased to 16.2%. The staghorn bryozoan, *Heteropora pacifica* was common along the eastern end of the transect. This bryozoan is typically rare at our monitoring sites but has appeared at several of the cooler water sites this year. Tunicate cover was relatively low at 1.3%. *Styela montereyensis* density was  $0.13/m^2$ , similar to last year. Sponge cover was 1.7% of the bottom, similar to last year. *Tethya aurantia* were abundant with a density of  $0.16/m^2$ , similar last year. *Urticina lofotensis* were abundant on the tops and sides of rocks, with a density of  $0.37/m^2$ , the highest density recorded since we began monitoring this species in 1982.

*Asterina miniata* density was  $2.0/m^2$ , similar to last year. As usual for this site, *Pisaster giganteus* were common on the rocky outcrops within the transect area, but there were few stars directly along the transect where they are counted in quadrats. Their densities on quadrats and 5-meter quadrats were  $0.042/m^2$  and  $0.030/m^2$  respectively. *Pycnopodia helianthoides* density was  $0.019/m^2$  and both large and small individuals were observed. The leather star, *Dermasterias imbricata*, was common. *Parastichopus parvimensis* density continued to be low with none observed on quadrats for the third consecutive year.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* continued to have dense patches. Their densities were  $4.83/m^2$  and  $2.71/m^2$  respectively, both similar to recent years. Juvenile *Strongylocentrotus* spp. were present, but rare. *Lytechinus anamesus* were not observed on band transects,  $0.0/m^2$ . No sea urchin or sea star wasting disease was observed.

*Kelletia kelletii* were abundant as usual for this site and counted on both band transects and quadrats with densities of  $0.17/m^2$  and  $0.38/m^2$  respectively and both were similar to recent years. Small *Kelletia kelletii* egg masses were common, similar to last year. *Lithopoma gibberosum* were common with a density of  $0.29/m^2$ .

Similar to recent years, *Haliotis rufescens* were mostly in crevices but there were a few out in the open. Their density remained high at 0.054/m<sup>2</sup> and was similar to the past three years. Fresh *H. rufescens* shells were uncommon. A total of 71 *H. rufescens* were located for size frequency measurements during a later monitoring cruise. One old *Haliotis assimilis/kamtschatkana* shell, measuring 56mm, was found. The shell morphology appeared to be a mix of *H. assimilis* and *H. kamtschatkana* characteristics. Rock crabs, *Cancer* spp. were common and crab traps were common around the reef that this transect is on. The coon striped shrimp, *Pandalus danae*, was abundant as we have observed at many other sites this year. *Idotea resicata* were abundant on the *Macrocystis pyrifera* stiples.

As usual, fish were more abundant on the high relief area at the western end of the transect. Similar to last year, the most abundant fish along the transect was the tubesnout, *Aulorhynchus flavidus*. There were notably less this year than in 2003 with approximately 550 observed. *Chromis punctipinnis* were rare with only two adults observed during the fish counts. Two adult and eight juvenile *Embiotoca jacksoni* were observed. Adult and juvenile *E. lateralis* were moderately abundant with up to 29 and 17 observed respectively. One adult and one juvenile *Damalichthys vacca* were observed. Two female and one large male *Semicossyphus pulcher* were observed, like last year. *Oxyjulis californica* were relatively uncommon with only nine adults observed, similar to last year. Painted greenlings, *Oxylebius pictus*, were moderately abundant with 33 observed. Juvenile *Sebastes* spp. were less abundant than last year with only two observed. However, juvenile *Sebastes atrovirens* were notably common with 26 observed, similar to last year. Eleven adult *S. atrovirens* were observed. Juvenile bocaccio, *Sebastes paucispinis*, were less abundant than last year with only two observed. No juvenile *Sebastes caurinus/carnatus* were observed this year. Forty adult and two juvenile *Sebastes mystinus* were observed. This is similar to the number of adults that were seen last year, but lower for juveniles. Two adult *Sebastes serranoides* and six juvenile *Sebastes serranoides/flavidus* were observed. Two large *Sebastes miniatus* were observed on the west end of the transect and we think this may be the same fish we have observed many times over the past decade. Only one of these was observed during the roving diver fish count. Adult black and yellow rockfish, *Sebastes chrysomelas*, were common with 11 observed during both fish counts, similar to last year. One adult and one juvenile *Sebastes serriceps* were observed. Two large lingcod, *Ophiodon elongatus*, were observed. *Coryphopterus nicholsii* density was 0.083/m<sup>2</sup>, lower than last year, but similar to years prior. Roving diver fish counts were conducted on July 28<sup>th</sup> with six divers and on September 29<sup>th</sup> with five divers observing 20 and 29 species of fish respectively.

The temperature loggers were retrieved and deployed and data were successfully downloaded. Both loggers were recording within specifications of each other.

## **Location: Hare Rock, San Miguel Island**

### **Site #2 SMHR**

2004 sampling dates: 7/27, 9/29

2004 status: Mature kelp forest.

This site continued to mature as a kelp forest though there are still high density patches of *Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus*. The *Macrocystis pyrifera* canopy covered 100% of the transect and was dense with mostly healthy plants. There was noticeably less sub-canopy algae which may have been a result of the low light conditions created by the dense canopy, similar to what we have observed at other sites with high canopy cover this year.

Adult, subadult and juvenile *M. pyrifera* densities all continued to increase and were recorded at 0.46/m<sup>2</sup>, 0.71/m<sup>2</sup>, and 1.46/m<sup>2</sup> respectively and cover increased to 15.2%. These are all relatively high densities for a mature kelp forest. Understory algae was notably less abundant than last year. Green algae cover, consisting entirely of *Ulva* sp. declined to 1.67% (in 2003, it was recorded at 51.0%). *Desmarestia* sp. remained relatively abundant with a cover of 13.0%, similar to last year. No adult or juvenile *Eisenia arborea*, *Pterygophora californica* or *Laminaria farlowii* were observed on quadrats or RPCs this year. *Cystoseira* sp. is typically absent from this site but there was a small amount present on the east end of the transect. *Cystoseira* sp. cover was 0.7% and was the first time since monitoring this species began in 1985 that it was recorded at this site. Miscellaneous red algae cover continued to decline for the third consecutive year and was recorded at 2.0%, the lowest since 1998. Articulated coralline algae remained uncommon with a cover of 0.67%. Encrusting coralline algae covered 32.5%; lower

than usual for this site. Miscellaneous plants (typically filamentous brown diatoms) were uncommon with none observed on RPC's for the second consecutive year. Bare substrate covered 17.8%, similar to recent years at this site.

The most common miscellaneous invertebrates on RPCs were hydroids. This category covered 10.7% of the bottom, similar to last year. *Spirorbis* sp. worms were noticeably less abundant than last year. *Corynactis californica* cover was higher than last year at 7.5%. *Balanophyllia elegans* and *Astrangia lajollaensis* cover were both 1.7%, similar to recent years. *Tethya aurantia* density was 0.029/m<sup>2</sup>, similar to recent years. Miscellaneous bryozoan cover decreased but remained high for this site at 12.7% and consisted mostly of *Membranipora* sp. *Diaperoecia californica* cover was 0.33%, similar to past years. The staghorn bryozoan, *Heteropora pacifica* was common on the eastern end of the transect. This is the first time I have observed this bryozoan growing at this site and this was a similar observation to several other sites this year. *Diopatra ornata* cover was 2.2%, the highest recorded since 1983. We have observed recruitment of this species at other sites this year. *Phragmatopoma californica* increased dramatically and had a cover of 11.8%, the highest recorded at this site since monitoring began in 1982 and the first time it has been observed on RPCs since 1992. Tunicate cover was 0.17%. *Styela montereyensis* density was 0.042/m<sup>2</sup>, the first time these have been observed on quadrats since 1983.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* continued to remain in high density patches scattered throughout the site. Several of these patches formed sea urchin feeding fronts. Both *S. franciscanus* and *S. purpuratus* densities increased this year and were recorded at 6.75/m<sup>2</sup> and 5.38/m<sup>2</sup> respectively. Juvenile *Strongylocentrotus* spp. were uncommon. No sea urchin wasting disease was observed.

*Asterina miniata* was abundant and density was similar to the previous three years at 2.08/m<sup>2</sup>. *Pisaster giganteus* was counted on both quadrats and 5-meter quadrats with densities of 0.54/m<sup>2</sup> and 0.31/m<sup>2</sup> respectively, similar to last year. *Pycnopodia helianthoides* remained moderately abundant with a density of 0.071/m<sup>2</sup>, similar to the last two years. All of the *P. helianthoides* were small to medium sized with no large ones being observed. Most of the *P. helianthoides* were less than 50mm. *Parastichopus parvimensis* were uncommon and very large in size, similar to previous years; their density was 0.13/m<sup>2</sup>. No sea star wasting disease was observed.

Small, fresh *Haliotis rufescens* shells remained relatively uncommon, similar to the previous three years indicating low recruitment. Two fresh *H. rufescens* shells were found this year and measured 20mm and 26mm. No *H. rufescens* were observed on band transects. *Kelletia kelletii* were present in low numbers with a density of 0.0028/m<sup>2</sup>. *Crassedoma giganteus* density remained low at 0.0028/m<sup>2</sup>, similar to recent years. *Aplysia californica* density was low at 0.0014/m<sup>2</sup>. *Cypraea spadicea* density was 0.33/m<sup>2</sup>.

Similar to last year, fish were abundant and diverse. Adult *Sebastes mystinus* were abundant with up to 65 observed, however no juveniles were observed this year. Juveniles were moderately abundant last year, and small adults, just over 10cm were common this year. Five adult and 13 juvenile *Sebastes atrovirens* were observed. Adult *S. serranoides* were common with up to five observed, similar to last year. Juvenile *Sebastes serranoides/flavidus* were less abundant than last year with only one observed. Two adult and no *Sebastes serriceps* were observed. Nine juvenile KGB's (*Sebastes caurinus/carnatus*) were observed. One adult black rockfish, *Sebastes melanops* was observed this year. Two adult copper rockfish, *Sebastes caurinus*, and one adult gopher rockfish, *Sebastes carnatus*, were observed. Adult black and yellow rockfish, *Sebastes chrysomelas*, were common with up to seven observed, similar to last year. Two juvenile bocaccio, *Sebastes paucispinis*, were observed. Up to nine adult and 16 juvenile *Chromis punctipinnis* were observed. Juvenile *C. punctipinnis* are relatively rare at this site and we observed them late in the season on September 29<sup>th</sup>. Four adult and one juvenile *Embiotoca jacksoni* were observed. Twenty-four adult and 11 juvenile *E. lateralis* were observed, similar to last year. Adult *Oxyjulis californica* were abundant with up to 400 observed. Juvenile *O. californica* were moderately abundant on September 29<sup>th</sup> with 254 observed. Two male and six female *Semicossyphus pulcher* were observed. Thirty seven painted greenling, *Oxylebius pictus*, were observed. Two stripefin ronquils, *Rathbunella hypoplecta*, were observed. Up to four lingcod, *Ophiodon elongatus*, and three adult cabezon, *Scorpaenichthys marmoratus*, were observed. Tubesnouts, *Aulorhynchus flavidus*, were moderately abundant with up to 400 observed. *Coryphopterus nicholsii* were common with a density of 0.33/m<sup>2</sup>, similar to last year. Roving diver fish counts were conducted on July 27<sup>th</sup> with four divers and on September 29<sup>th</sup> with five divers observing 20 and 29 species of fish respectively.

The temperature loggers were retrieved and deployed and data were successfully downloaded. Both loggers were reading within specifications of each other.

## Location: Miracle Mile, San Miguel Island

### Site #21 SMMM

2004 sampling dates: 9/28, 10/14.

2004 status: Mature kelp forest.

Note: This is not one of the original kelp forest monitoring sites. This site was set up by Jim Marshall, a commercial abalone and sea urchin fisherman to monitor high density aggregations of *Haliotis rufescens* and was funded by the County of Santa Barbara, and with the assistance of Channel Islands National Park. Initially three permanent 100 meter sites were to be installed, but only one (Miracle Mile) was installed due to funding availability. Miracle Mile was chosen due to its large dense aggregation of *Haliotis rufescens*.

This year we were able to complete ARMs monitoring, 5-meter quadrats, quadrats, band transects, and size frequencies for *Haliotis rufescens*, *Strongylocentrotus franciscanus* and *S. purpuratus*. No random point contacts, fish transects, roving diver fish count or video were conducted this year due to lack of time.

The most noticeable change at this site was a dramatic increase in *Phragmatopoma californica*. Unfortunately, we did not conduct random point contacts this year to describe this change. David Kushner estimated that 25% of the bottom was covered by *P. californica*. All of the ARMs were estimated to be at least 50% or more encrusted by *P. californica*. There appeared to be less *P. californica* at the deeper eastern end of the transect, where there were noticeably more *Haliotis rufescens*. It appeared that the *P. californica* may have displaced the *H. rufescens* along the western end of the transect.

Similar to 2003, *Macrocystis pyrifera* formed a thick mature canopy that was estimated to cover 80% of the transect. Adult, subadult, and juvenile densities were all lower than last year at 0.19/m<sup>2</sup>, 0.15/m<sup>2</sup> and 0.0/m<sup>2</sup> respectively. A decrease in densities is not uncommon in a maturing kelp forest. Understory algae were moderately abundant and consisted mostly of *Eisenia arborea*, *Pterygophora californica* and miscellaneous red algae. There was noticeably less *Desmarestia* sp. than last year. Adult and juvenile *E. arborea* were abundant on the top of the reef with a density of 1.2/m<sup>2</sup> and 0.33/m<sup>2</sup> respectively. Adult and juvenile *P. californica* were abundant in the deeper areas of the transect with densities of 1.6/m<sup>2</sup> and 0.25/m<sup>2</sup> respectively. Both juvenile *E. arborea* and *P. californica* were less abundant than last year. Red algae were common, but appeared to be less abundant than last year.

Random Point Contact surveys were not conducted this year so we have little encrusting invertebrate information. Again, the largest change was a dramatic increase in *Phragmatopoma californica*. These covered much of the bottom and ARMs. *Urticina lofotensis* were abundant with a density of 0.22/m<sup>2</sup>, higher than past years. *Tethya aurantia* were abundant with a density of 0.23/m<sup>2</sup>, also higher than past years.

*Strongylocentrotus franciscanus* density continued to decline for the second year and was recorded at 4.3%. *Strongylocentrotus purpuratus* density remained low at 0.75/m<sup>2</sup>. *Asterina miniata* were abundant and their density continued to increase for the third consecutive year to 3.46/m<sup>2</sup>. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.21/m<sup>2</sup> and 0.38/m<sup>2</sup> respectively. *Pycnopodia helianthoides* density was 0.049/m<sup>2</sup>, higher than the past two years. *Parastichopus parvimensis* density was lower than last year at 0.042/m<sup>2</sup>.

*Haliotis rufescens* were counted on both band transects and quadrats. Quadrats are not the proper protocol for this species, but are easy to add as an additional species and we decided to count them using this technique because of their high abundance at this site. Their densities were 0.55/m<sup>2</sup> and 0.42/m<sup>2</sup> respectively. These represent a small decline on band transects and a small increase on quadrats, but there is a lot of sampling variability with both techniques. *Haliotis rufescens* density on band transects have continuously declined since this site was established in 2001. This is not an unlikely result since the transect was installed in an area that appeared to have the highest density of *H. rufescens*. Only a few fresh *H. rufescens* shells were present and older shells are common, but in general do not appear to be abnormally abundant for an area with such a high

density of live animals. For the third consecutive year, it appears that *H. rufescens* have continued to shift towards the eastern side of the transect. As noted above, much of the western end of the transect is now dominated by *Phragmatopoma californica*. It may be interesting to map out the abalone on band transects over the past four years to see if they have moved within the transect area.

No *Lithopoma undosum* were observed this year. *Lithopoma gibberosum* density was  $0.17/m^2$ , similar to past years. *Kelletia kelletii* density was  $0.017/m^2$ , higher than the past three years. *Megathura crenulata* remained relatively abundant with a density of  $0.058/m^2$ , but this was the lowest recorded at this site. *Crassedoma giganteum* density was  $0.0011/m^2$ . We didn't count rock crabs, *Cancer* spp. (either *C. antennarius* or *C. productus*) on band transects this year.

*Coryphopterus nicholsii* were uncommon along most of the transect with a density of  $0.042/m^2$ , similar to previous years. No fish transects or roving diver fish counts were conducted due to the lack of time. One white shark, *Carcharodon carcharias* was observed by David Kushner. He estimated the size to be at least 2.75 meters, but this is a rough estimate. The shark was swimming inshore of the transect line at the edge of the kelp bed and rocky reef. This is the first *C. carcharias* that has been observed on the kelp forest monitoring program since its inception in 1982.

Seven ARMs were intact, in good condition, and all were monitored for all indicator species. Six of these ARMs were monitored on September 28<sup>th</sup> by the kelp forest monitoring staff and the other ARM (#8) was monitored by Jim Marshall on October 14<sup>th</sup>.

Twenty one *Haliotis rufescens* were found in the ARMs for a density of 3.0/ARM, the highest recorded since we began monitoring the ARMs in 2002. Most of the abalone found in the ARMs were small with a mean size of 55.9mm. Over 57.0% of the abalone found were less than 45mm, similar to last year. *Crassedoma giganteum* density was 0.57/ARM. *Asterina miniata* density was 8.14/ARM similar to last year and their mean size decreased to 26.3mm. *Pisaster giganteus* density was 1.29/ARM and mean size was 34.9mm, similar to last year. *Pycnopodia helianthoides* density was 0.43/ARM, similar to last year. *Strongylocentrotus franciscanus* density was similar to last year at 7.43/ARM and size increased to 68.5mm, with none less than 14mm indicating no recruitment. *Strongylocentrotus purpuratus* density continued to decline, and were rare with 1.14/ARM (Their density in 2002 and 2003 were 24.7/ARM and 7.33/ARM respectively). Similar to previous years, no *Parastichopus parvimensis* were observed in the ARMs

No temperature loggers were deployed at this site; this is the only KFM site that does not have a temperature logger.

## **Location: Johnson's Lee North, Santa Rosa Island**

### **Site #3 SRJLNO**

2004 sampling dates: 7/29, 8/25.

2004 status: Mature kelp forest.

This site remained a mature kelp forest and was similar to last year though some abundances have noticeably changed. *Macrocystis pyrifera* canopy cover over the transect was estimated at 80%, similar to last year. The canopy was not particularly thick which seems to be usual for this site. Similar to Johnson's Lee South, percent cover and adult and subadult densities of *M. pyrifera* declined, while juveniles increased. Adult, subadult and juvenile *M. pyrifera* densities were  $0.21/m^2$ ,  $0.075/m^2$  and  $4.21/m^2$  respectively. Cover was 14%, the lowest since 2000. Most of the *M. pyrifera* plants were large, this combined with decreasing densities is indicative of a maturing kelp forest. Adult *Eisenia arborea* were moderately abundant on the upper edge of the shelf just inshore of the transect line, but densities were low directly along the transect with no adults and only one juvenile ( $0.042/m^2$ ) observed on quadrats, and none observed on RPCs. Adult and juvenile *Pterygophora californica* densities were lower than last year at  $0.042/m^2$  and  $0.0/m^2$  respectively. However, cover on RPCs was higher at 7.8%, the highest recorded since 1998. *Pterygophora californica* were common, but patchy, which is most likely the reason for the discrepancy in the data. Adult and juvenile *Laminaria farlowii* were noticeably more common than last year with densities of  $0.083/m^2$  and  $0.042/m^2$  respectively and a cover of 0.17%. Most of the *L. farlowii* were present over a meter from the transect, similar to the situation with *E. arborea*. *Cystoseira* sp. cover was

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common with a cover of 6.0%, similar to the past two years. No *Desmarestia* sp. was observed this year. Green algae and miscellaneous brown algae cover were low at 0.17% and 0.5% respectively, similar to last year. *Gigartina* spp. (mostly *G. corymbifera*) was common with a cover of 4.0%, the highest recorded since 1998. Miscellaneous plant cover consisting entirely of filamentous diatoms and was 4.8%, higher than last year. Articulated and encrusting coralline algae cover was similar to last year at 2.5% and 5.0% respectively. Bare substrate cover continued to increase to 15.3%, the highest recorded since 2000. There was noticeably more sand and less rock and cobble. Sand cover increased to 12.7%, the highest recorded at this site though similar to 1986 and 1996, while rock and cobble decreased to 85.7% and 1.7% respectively.

Miscellaneous invertebrate cover, excluding *Ophiothrix spiculata*, was higher than last year at 13.3%. This category consisted mostly of hydroids. There were noticeably fewer amphipod tube mats which were abundant last year. Tunicate abundance notably declined from 2003. Tunicate cover declined to 5.5%, down from 37.3% in 2003. *Styela montereyensis* density also declined to 1.6/m<sup>2</sup>, down from 6.01/m<sup>2</sup> in 2003. Sponges covered 3.3%, higher than the past several years. *Tethya aurantia* remained abundant at 0.093/m<sup>2</sup>, similar to recent years. *Phragmatopoma californica* were less abundant than last year with a cover of 1.8%. Miscellaneous bryozoans were noticeably less abundant with a cover of 10.3%. *Diaperoecia californica* cover was 0.67%, similar to past years. The bryozoan *Hippodiplosia insculpta* was noticeably less abundant than last year. *Corynactis californica* were common with a cover of 2.8%, similar to past years. *Balanophyllia elegans* and *Astrangia lajollaensis* covered 2.0% and 1.2% of the bottom respectively.

Both *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* densities remained low and were similar to last year with 0.79/m<sup>2</sup> and 1.3/m<sup>2</sup> respectively. Though *S. purpuratus* continued to be relatively rare, they were more abundant than last year. The *S. purpuratus* that were present continued to reside in small depressions on the tops of rocky reef or in cracks, similar to recent years. Most of the *Strongylocentrotus* spp. resided in cracks and crevices. Overall, there were few juvenile *Strongylocentrotus* spp. No sea urchin wasting disease was observed.

*Pycnopodia helianthoides* density remained high and was similar to last year at 0.11/m<sup>2</sup>. Both small and large *P. helianthoides* were common. *Asterina miniata* density was 0.46/m<sup>2</sup>, similar to last year and relatively high for this site. *Pisaster giganteus* densities declined and they were counted on both quadrats and 5-meter quadrats with densities of 0.13/m<sup>2</sup> and 0.19/m<sup>2</sup> respectively. *Parastichopus parvimensis* density was 0.33/m<sup>2</sup>, similar to previous years. No sea star wasting disease was observed this year.

*Cypraea spadicea* density was 0.58/m<sup>2</sup>, similar to previous years. No *Lithopoma undosum* were observed along the transect this year. In the early 1990s, large *L. undosum* were common, but they have gradually declined. *Kelletia kelletii* were relatively rare with a density of 0.0014/m<sup>2</sup>, similar to previous years. *Megathura crenulata* density continued to decline for the third consecutive year and was 0.0056/m<sup>2</sup>. This is similar to last year, but the lowest density was recorded at this site since monitoring began. No *Aplysia californica* were observed along the transect this year, similar to Johnson's Lee South. There were noticeably more *Haliotis rufescens* observed along the transect this year. They were recorded at a density of 0.0069/m<sup>2</sup>, the highest recorded since 2000. Twelve *H. rufescens* were located for size frequency measurements and ten of these were less than 95 mm indicating successful recruitment in recent years. This is similar to what we observed at the Johnson's Lee South site and it appears promising that abalone densities might continue to increase. One fresh 118mm *H. rufescens* shell was found.

Similar to the last two years, fish were abundant and diverse. Adult *Chromis punctipinnis* were common with up to 105 observed. No juvenile *C. punctipinnis* were observed this year. Adult *Hypsypops rubicundus* remained relatively abundant for this site and six were observed, similar to last year. The adult with the nest at meter 72 was present as he has been since about 1990. One female *Halichoeres semicinctus* was observed this year. Up to 87 adult and 220 juvenile *Oxyjulis californica* were observed. *Semicossyphus pulcher* were abundant with up to eight male and 12 to 26 females observed on July 29<sup>th</sup>. Fewer *S. pulcher* were present during our August 25<sup>th</sup> visit. Adult *Sebastes serranoides* were abundant with up to 29 observed on July 29<sup>th</sup>. Juvenile *S. serranoides* were uncommon with only one observed. Twenty five adult and one juvenile *Sebastes mystinus* were observed. Adult *Sebastes atrovirens* were abundant with 38 observed. Juveniles were rare with only one observed. Most of the adult *S. atrovirens* were about 15cm. Four adult and four juvenile *Sebastes serriceps* were observed, similar to last year. Juvenile *Sebastescaurinus/carnatus* were less abundant than last year with only two observed. Four juvenile bocaccio, *Sebastes paucispinis*, were observed. Similar to last year adult *Embiotoca jacksoni* and

*Embiotoca lateralis* were abundant with 16 and 51 observed, respectively. Juveniles were less abundant than last year with three of each species observed. Seventeen adult and no juvenile *Damalichthys vacca* were observed. Six adult rubberlip surfperch, *Rhacochilus toxotes*, were observed. Kelp surfperch, *Brachyistius frenatus*, were abundant in the kelp canopy, similar to what we have observed at other sites with kelp this year. Two adult *Girella nigricans* were observed. Eight rainbow surfperch, *Hypsurus caryi* were observed. Three adult *Paralabrax clathratus* were observed. One *Ophiodon elongatus* (lingcod) was observed. *Coryphopterus nicholsii* were common in the low-lying areas of the transect, but their density along the transect was 0.13/m<sup>2</sup> does not reflect their optimal habitat. Roving diver fish counts were conducted on July 29<sup>th</sup> with six divers and on August 25<sup>th</sup> with five divers observing 25 and 32 species of fish respectively.

All nine ARMs were intact, and monitored for all indicator species. Four ARMs were present in the south group, three in the middle group and two in the north group. Similar to the past two years, two octopuses were observed this year and both were in the same ARM. No notes were taken on what was encrusting the bricks this year. In previous years the bricks were often covered by encrusting colonial tunicates (mostly *Cystodytes lobatus* and *Trididemnum* sp.).

Four *Haliotis rufescens* were found among the nine ARMs this year or 0.44/ARM, the highest density recorded since 1995. The *H. rufescens* sizes were 79, 83, 112 and 116mm. These are probably several years old and represent two years of recruitment from their size ranges. The sizes are similar to the animals we found on natural habitat size frequencies at this site.

*Cypraea spadicea* density continued to increase for the third consecutive year and they were relatively abundant with 10.22/ARM, the highest recorded at this site since we began monitoring them in the ARMs. *Crassedoma giganteum* were more abundant in the ARMs than in recent years with 1.22/ARM. Most were small with a mean size of 34.3mm.

*Asterina miniata* continued to increase for the fifth consecutive year to 4.0/ARM, the highest density recorded at this site. Their mean size was similar to last year at 40.5mm. *Pisaster giganteus* density was slightly lower than last year at 2.2/ARM, the lowest density recorded since 1999. *Pycnopodia helianthoides* density continued to decline for the third consecutive year and was 0.44/ARM., the lowest since 1999. *Strongylocentrotus franciscanus* density was slightly higher than last year at 15.3/ARM, with a mean size similar to last year at 59.6mm. *Strongylocentrotus purpuratus* abundance increased to 3.4/ARM. Their mean size was similar to last year at 26.2mm. No *Parastichopus parvimensis* were observed in the ARMs this year, the lowest density recorded at this site.

The temperature loggers were retrieved and deployed and all temperature data were collected successfully.

## **Location: Johnson's Lee South, Santa Rosa Island**

### **Site #4 SRJLSO**

2004 sampling dates: 7/29, 8/24, 8/25, 8/26.

2004 status: Mature kelp forest.

Similar to Johnson's Lee North, this kelp forest continued to mature, and is typical of a mature forest with large widely spaced *Macrocystis pyrifera*. Also, many of the increases and decreases of species at this site are similar to Johnson's Lee North. *Macrocystis pyrifera* canopy cover over the transect was estimated at 60% in July and was thin. Percent cover and adult and subadult densities of *M. pyrifera* declined, while juveniles increased. Adult, subadult and juvenile *M. pyrifera* densities were 0.22/m<sup>2</sup>, 0.08/m<sup>2</sup> and 3.67/m<sup>2</sup> respectively and cover was 7.2%, the lowest since 2001. There were few *Eisenia arborea* directly along the transect where quadrats are conducted. However, adults and juveniles were common and noticeably more abundant on the tops of high relief areas along the transect. Adult and juvenile densities were 0.17/m<sup>2</sup> and 0.0/m<sup>2</sup> respectively and cover was 0.5%. Adult and juvenile *Pterygophora californica* densities were 0.33/m<sup>2</sup> and 0.0/m<sup>2</sup>, and cover was 1.4%. Several juveniles were observed within the transect, but not in quadrats. Adult and juvenile *Laminaria farlowii* were common with densities of 0.21/m<sup>2</sup> and 0.25/m<sup>2</sup>, respectively, and had a cover of 2.8%. Miscellaneous brown algae cover was 2.0%. *Desmarestia* sp. was present with a cover of 0.5%. Small *Cystoseira* spp. were common but none were observed on RPCs (0.0%). Cover of miscellaneous red algae was 26.2%, similar to last year.

*Gigartina* spp. (mostly *G. corymbifera*) continued to increase in abundance and cover was recorded at 9.7%, the highest since 1996. Most of the *G. corymbifera* were present on the first 25 meters of the transect. Articulated coralline algae cover was 6.7%, higher than the past several years. Encrusting coralline algae cover was 14.8%, similar to last year. Bare substrate cover increased to 28.3%, relatively high for this site.

Miscellaneous invertebrates on RPCs covered 13.3% of the bottom, similar to past years. The most common invertebrates in this category were the sea cucumber *Cucumaria* spp, anemones and hydroids. Miscellaneous bryozoan cover was 17.0%, similar to recent years. *Diaperoecia californica* cover was 2.5%, the highest recorded at this site since monitoring began. Similar to past years, *D. californica* was abundant on the steep parts of high relief rocks and is uncommon directly along the transect. Similar to Johnson's Lee North, tunicates were noticeably less abundant and cover declined to 3.2%. *Styela montereyensis* density decreased to 0.38/m<sup>2</sup>. Similar to Johnson's Lee North, sponge cover increased to 3.0% and *Tethya aurantia* density continued to increase to 0.32/m<sup>2</sup>, the highest recorded at this site since we began monitoring this species in 1983. *Balanophyllia elegans* cover was 4.3%, similar to the past several years. *Astrangia lajollaensis* cover was similar to past years at 1.8%. *Corynactis californica* cover remained relatively high at 5.7%. *Diopatra ornata* cover was 9.7%, lower than the past several years. *Lophogorgia chilensis* and *Muricea californica* densities were 0.071/m<sup>2</sup> and 0.0014/m<sup>2</sup>, similar to recent years. *Urticina lofotensis* density remained relatively high at 0.12/m<sup>2</sup>.

*Strongylocentrotus franciscanus* density was lower than last year at 0.58/m<sup>2</sup>, and the decline may have been a result of patchiness that we described last year. *Strongylocentrotus purpuratus* density remained low at 0.67/m<sup>2</sup>, similar to the past two years. Juvenile *Strongylocentrotus* spp. were relatively uncommon. No sea urchin wasting disease was observed.

*Pycnopodia helianthoides* density remained high at 0.10/m<sup>2</sup>, similar to last year. *Asterina miniata* density continued to increase and was 3.17/m<sup>2</sup>, the highest since 1996. *Pisaster giganteus* were counted in both quadrats and 5-meter quadrats and their densities declined to 0.042/m<sup>2</sup> and 0.06/m<sup>2</sup>, respectively. *Parastichopus parvimensis* density remained low at 0.042/m<sup>2</sup>, similar to past years. No sea star wasting disease was observed.

Similar to Johnson's Lee North, *Haliotis rufescens* density increased to 0.0069/m<sup>2</sup>, the highest since 2000. Seven were located for size frequency measurements and five of these were less than 125mm indicating recent recruitment, similar to what we observed at the Johnson's Lee North site. Two fresh *Haliotis assimilis* shells were found and these measured 43mm and 49mm. Two fresh *H. rufescens* shells were also found and these measured 76mm and 83mm, indicating recent recruitment.

*Cypraea spadicea* density was low this year at 0.083/m<sup>2</sup>, but there appears to be much variability with this species. *Kelletia kelletii* density was 0.0042/m<sup>2</sup>, relatively low for this site and the lowest recorded since 1991. *Crassedoma giganteum* density was 0.014/m<sup>2</sup>. No *Aplysia californica* were observed along the transect this year. *Megathura crenulata* density continued to decline for the third consecutive year, similar to Johnson's Lee North. Their density was 0.0028/m<sup>2</sup>, the lowest since 1995. Four heart crabs, *Phyllolithodes papilla* were observed in the ARMs this year. These are rare this far south, but have been observed in the ARMs at this site in recent years.

Fish were abundant and diverse at this site, similar to past years and at Johnson's Lee North. Adult *Chromis punctipinnis* were not as abundant as Johnson's Lee North with 31 observed. Adult *Oxyjulis californica* were common with up to 180 observed, and no juveniles were observed this year. *Semicossyphus pulcher* were moderately abundant with 20 females and four males observed, similar to last year. Most of the *S. pulcher* were small. Eleven adult and no juvenile *Sebastes serranoides* were observed. Twenty three adult and no juvenile *Sebastes mystinus* were observed. One adult and three juvenile *Sebastes serriceps* were observed, this was more juveniles observed than in 2003. Adult *Sebastes atrovirens* were moderately abundant with 29 observed. Two juvenile *S. atrovirens* were observed, notably less than last year. Adult black and yellow rockfish, *Sebastes chrysomelas*, were common with nine observed. Juvenile *Sebastes carnatus/caurinus* were less common than last year with only one observed. Three adult gopher rockfish, *Sebastes carnatus* were observed. Similar to Johnson's Lee North, *Embiotoca jacksoni* and *E. lateralis* were abundant. Twenty five adult and one juvenile *E. jacksoni*, and 47 adult and three juvenile *E. lateralis* were observed. There were fewer juveniles for both these species than were observed last year, but similar counts for the adults. Thirteen adult and no juvenile *Damalichthys vacca* were observed. Seven adult *Paralabrax clathratus* were observed and all were well over 30cm. *Oxylebius pictus* were common with 39 observed, similar to last year. *Coryphopterus nicholsii* remained

common with a density of 0.42/m<sup>2</sup>, lower than the past several years. One *Scorpaenichthys marmoratus* (cabezon) was observed. One *Ophiodon elongatus* (lingcod) were observed. Two red brotulas, *Brosmophycis marginata*, were observed in the ARMs this year. We have observed these once before in the ARMs at this site. Roving diver fish counts were conducted on July 29<sup>th</sup> with six divers and on August 24<sup>th</sup> with four divers observing 28 and 22 species of fish respectively.

All seven ARMs were intact and monitored for all indicator species. Two ARMs cages and one lid were replaced. Three *Haliotis rufescens* were found in the ARMs this year, 0.43/ARM. This is lower than last year, but similar to previous years. *Cypraea spadicea* density increased to 5.57/ARM, the highest since 1998. Two small *Megathura crenulata* were observed 0.29/ARM, similar to past years. *Crassedoma giganteus* density was 0.57/ARM. *Asterina miniata* density declined to 7.71/ARM, and mean size increased to 45.8mm. *Pisaster giganteus* density remained the same at 1.14/ARM. *Pycnopodia helianthoides* were common in the ARMs with an increase in density to 1.29/ARM. No *Parastichopus parvimensis* <10cm were observed. However, *Parastichopus parvimensis* >10cm were observed at a relatively low density of 0.29/ARM, similar to last year. *Strongylocentrotus franciscanus* density was slightly lower than last year at 31.57/ARM and size continued to increase to 59.04mm for the third consecutive year indicating little recent recruitment. *Strongylocentrotus purpuratus* density also declined slightly to 9.43/ARM, similar to past years. Mean size was similar slightly higher at 27.8mm.

As mentioned above, four heart crabs, *Phyllolithodes papillosus*, were found in the ARMs this year. One was found in ARM #2417, and in ARM #2450 and two in ARM #2453. We have observed this species in the ARMs at this site in 1997, 2002, 2003 and 2004 and we believe this may be a range extension for this species.

The temperature loggers were working properly and all temperature data were successfully downloaded. Both loggers were recording temperatures within specifications of each other.

## Location: Rodes Reef, Santa Rosa Island

### Site #5 SRRR

2004 sampling dates: 7/26, 7/27, 9/27.

2004 status: Mature kelp forest.

The kelp at this site continued to mature from last year and the site is now a mature kelp forest with large, widely spaced, canopy forming adult *Macrocystis pyrifera* plants. Canopy cover over the transect was 100% and dense, but not as dense as the San Miguel Island sites. Similar to the other sites that had thick canopy's this year, there were relatively little understory algae. Thick *M. pyrifera* canopy created low light conditions on the bottom which does not seem favorable for understory algal growth.

Adult *Macrocystis pyrifera* density increased to 0.12/m<sup>2</sup>, the highest recorded at this site since at least 1996 when this category was sampled on 5-meter quadrats. Subadult *M. pyrifera* densities were similar to last year at 0.33/m<sup>2</sup>. Juvenile *M. pyrifera* were scattered around most of the transect with a density of 0.67/m<sup>2</sup> and cover on the bottom remained the same at 9.0%. All of these abundances remain some of the highest recorded in the past 12 years at this site. Understory algae were uncommon with no *Eisenia arborea*, *Pterygophora californica*, *Cystoseira* spp., *Laminaria farlowii* or *Desmarestia* sp. observed along the transect this year. *Desmarestia* sp. were abundant in 2003, but this genus has high annual variation. Miscellaneous red algae cover notably decreased to 4.7%, the lowest since 2000. This site has had an abundance of understory red algae since 1983. *Gigartina* sp. and *Gelidium* sp. were noticeably less abundant than last year and none were observed on RPCs. Similar to last year and at other sites this year, no miscellaneous plants (brown filamentous diatoms) were observed on RPCs. Articulated coralline algae were uncommon with 0.17% cover. Encrusting coralline algae covered 41.0% of the bottom, a decrease from last year and the lowest value recorded since 1995. Bare substrate covered 9.8% of the bottom.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, cover were noticeably higher than last year, but similar to previous years at 15.2%. The most common miscellaneous invertebrate was the hydroid *Obelia* sp. In past years *Chaetopterus variopedatus* were moderately abundant on the eastern half of the transect, but in recent years this worm has been relatively uncommon for this site. *Diopatra ornata* noticeably increased on the low-lying

first 50m of the transect and covered 6.3% of the bottom, the highest recorded since 1994. There was a noticeable recruitment event as most of the *D. ornata* were small. In past years it has been uncommon to observe large, dense patches of small *D. ornata*. *Phragmatopoma californica* were noticeably more abundant than usual at this site with a cover of 6.3%, the highest recorded at this site since we began monitoring this species in 1983. The increase in *P. californica* is similar to what we have observed at other sites this year. *Astrangia lajollaensis* cover was 8.0%, similar to past years. *Balanophyllia elegans* and *Corynactis californica* cover remained low at 1.5% and 0.17% respectively. Miscellaneous bryozoan cover remained high at 11.8% and consisted mostly of *Membranipora* sp. *Diaperoecia californica* were common on the steep sides of rocky relief, and cover directly along the transect was 1.3%, similar to past years. *Urticina lofotensis* density was 0.040/m<sup>2</sup>, similar to previous years. *Urticina coriacea* and *Urticina colombiana* were also common, which is typical for this site. *Lophogorgia chilensis* were rare along the transect, with a density of 0.0028/m<sup>2</sup>, similar to past years. *Tethya aurantia* were moderately abundant at 0.099/m<sup>2</sup>, similar to previous years. *Styela montereyensis* were more abundant than in recent years with a density of 0.38/m<sup>2</sup>, the highest recorded since 1998. The bright orange encrusting tunicate that has been present at this site for the past several years remained in low abundance for the second year. Tunicate cover was 1.5%.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* densities remained at some of their lowest densities, 2.17/m<sup>2</sup> and 0.17/m<sup>2</sup> respectively. Juvenile *Strongylocentrotus* spp. were rare indicating little recruitment. No *Lytechinus anamesus* were observed on band transects, similar to the last several years. No sea urchin wasting disease was observed.

No *Ophiothrix spiculata* were observed on RPCs similar to last year. *Asterina miniata* density remained high at 3.04/m<sup>2</sup>. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats, with densities of 0.54/m<sup>2</sup> and 0.39/m<sup>2</sup> respectively, both a decrease from 2003. *Pycnopodia helianthoides* density remained similar to last year at 0.074/m<sup>2</sup>. All sizes of *P. helianthoides* were present but small (less than 100mm), and were common indicating some recent recruitment. Large *Parastichopus parvimensis* were present in low abundance on the western and rocky half of the transect, but none were observed in quadrats this year (0.0/m<sup>2</sup>), similar to past years. These continued to be some of the largest *P. parvimensis* we have observed anywhere on the Islands.

No live *Haliotis* spp. were observed along the transect this year. *Kelletia kelletii* density was 0.0097/m<sup>2</sup>, similar to past years. No *Lithopoma undosum* were observed along the transect this year. *Lithopoma gibberosum* were rare with a density of 0.13/m<sup>2</sup>. *Megathura crenulata* were common on the western and rocky end of the transect with a density of 0.021/m<sup>2</sup>, lower than the last several years. *Aplysia californica* were rare, and none were observed on band transects this year. *Cypraea spadicea* density was 0.042/m<sup>2</sup>, relatively low for this site, but the same as last year. Rock crabs, *Cancer* spp. (all *Cancer productus* or *C. antenarius*), were common but not counted this year.

Fish were less diverse than in 2003. The most notable change in the fish assemblage was the decline in juvenile *Sebastes* spp. However, small adult (probably two-year-old) *Sebastes* spp. were common in several species. Similar to previous years, fish were concentrated at the western and rocky end of the transect. There were noticeably fewer juvenile *Sebastes* spp. than last year. Up to 24 adult and no juvenile *Chromis punctipinnis* were observed. Fifteen adult and five juvenile *Embiotoca jacksoni* were observed, similar to last year. *Embiotoca lateralis* were abundant with up to 39 adult and 12 juveniles observed. Four adult rubberlip surfperch, *Rhacochilus toxotes*, were observed, similar to last year. Four adult and 16 juvenile *Rhacochilus vacca* were observed. Kelp surfperch, *Brachyistius frenatus*, were common with up to 18 observed. Two large adult *Paralabrax clathratus* were observed, similar to previous years. We observed the *P. clathratus* in the same location and it is very likely these are the same fish we have observed the past several years. Up to 44 adult and no juvenile *Sebastes mystinus* were observed. Juvenile *Sebastes mystinus* were common in 2003 and none were observed this year. However, small adults were common and were presumably from last year's recruitment. Nine adult and two juvenile *S. atrovirens* were observed. There were notably fewer juveniles than last year, and several of the adults were small and presumably from last year's recruitment. Two adult *Sebastes serranoides* and no juvenile *Sebastes serranoides/flavidus* were observed. Juvenile *S. serranoides/flavidus* were abundant last year. No adult or juvenile *Sebastes serriceps* were observed. No KGB juvenile rockfish, *Sebastes carnatus/caurinus*, were observed this year. One adult black and yellow rockfish, *Sebastes chrysomelas*, and three adult copper rockfish, *Sebastes caurinus* were observed. Three male and two female *Semicossyphus pulcher* were observed, all of moderate size. Adult *Oxyjulis californica* were common with up to 68 observed. No *Ronquil* spp. were observed this year. Up to 40 painted greenlings, *Oxylebius pictus*, were observed. One

*Alloclinus holderi* was observed during each of the two fish counts. *Coryphopterus nicholsii* density was  $0.042/m^2$ , similar to past years. Roving diver fish counts were conducted on July 26<sup>th</sup> with four divers and on September 27<sup>th</sup> with four divers observing 19 and 21 species of fish respectively.

The temperature loggers were retrieved, deployed, and all of the data were successfully downloaded.

Several new stainless steel eyebolts were installed and line repair was also conducted on 9/27. However, this site still needs at least four new thread rods installed.

## **Location: Gull Island, Santa Cruz Island**

### **Site #6 SCGI**

2004 sampling dates: 7/13, 8/23, 9/30.

2004 status: Mature kelp forest.

This site continued to mature as a kelp forest with large, widely spaced, *Macrocystis pyrifera* plants and a thick canopy that was estimated to cover 85% of the transect. Most of the macroalgae at this site appeared healthy and had relatively few epiphytes growing on the blades. Adult *M. pyrifera* density declined, a decline is typical for a maturing kelp forest. Subadult *M. pyrifera* density was similar to last year and juvenile density increased. Adult, subadult, and juvenile densities were  $0.13/m^2$ ,  $0.41/m^2$  and  $6.29/m^2$  respectively. *Macrocystis pyrifera* cover on the bottom was similar to last year at 24.0%. Adult *Eisenia arborea* density remained low at  $0.042/m^2$  while juveniles increased in density to  $2.0/m^2$ , the highest density recorded since juveniles were separated out in 1996. Cover of *E. arborea* increased to 5.2%. Several adult and juvenile *Pterygophora californica* were observed with densities of  $0.042/m^2$  and  $0.63/m^2$  respectively, and covered 0.7% of the bottom. This was the highest density of juvenile *P. californica* recorded since this category was separated out in 1996. No adult *Laminaria farlowii* were observed and juvenile density was  $0.25/m^2$ , the highest recorded since this category was separated out in 1996. No *L. farlowii* was observed on random point contacts, but several small *L. farlowii* were observed. Small *Cystoseira sp.* were present in low numbers with a cover of 0.33%. Miscellaneous red algae were notably more abundant than last year with a cover of 29.3%, the highest cover ever recorded at this site. Much of this category consisted of a low growing foliose red algae, and we were unable to identify it. Miscellaneous plants, consisting of filamentous brown diatoms, were rare and none were observed on RPCs, similar to last year. Articulated coralline algae cover was similar to the last several years at 1.5%. Encrusting coralline algae cover was 31.8% similar to last year, but relatively low compared to the previous years. Bare substrate declined to 1.7%, the lowest cover recorded at this site since monitoring of this category began in 1985.

The most common miscellaneous invertebrates on RPCs were hydroids, amphipod tube mats, and the worm *Pista elongata*. Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 24.8% of the bottom, similar to last year, but still a relatively high cover for this category. There were no *O. spiculata* observed on RPCs. *Corynactis californica* cover declined to 2.0%, which is relatively low for this site. *Balanophyllia elegans* and *Astrangia lajollaensis* cover were 1.3% and 1.7% respectively, and both were relatively low for this site. Similar to past years, *Diopatra ornata* were common in the low-lying sandy areas of the transect, but were rare directly along the transect where they are monitored on RPCs with a cover of 0.17%. Miscellaneous bryozoan cover declined to 16.2%. *Diaperoecia californica* continued to gradually increase for the fourth consecutive year and was recorded at 8.0%, the highest cover recorded at this site since monitoring began in 1982. Similar to last year, the most common bryozoans were *Membranipora sp.*, *D. californica*, *Phidolopora pacifica*, and *Costazia castazi*. *Lophogorgia chilensis* density was  $0.038/m^2$ , higher than last year, but still relatively low for this site. *Tethya aurantia* density increased to  $0.063/m^2$ , the highest density recorded since 1985. *Stylaster californica* density remained relatively high at  $0.078/m^2$ , similar to the last several years. Both large and small colonies of *S. californica* were common. The bright orange hydroid, *Garveia annulata*, was noticeably more abundant than last year on the top of the reef near the southern end of the transect and it was also observed at several other places along the transect. It was always observed growing on articulated coralline algae.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* were rare and their densities were both the same as last year and remained the lowest recorded since monitoring began in 1982. Their densities were  $0.13/m^2$ , and  $0.042/m^2$  respectively. Juvenile *Strongylocentrotus spp.* were rare. Four *Lytechinus anamesus* were observed on band transects for a density of  $0.0056/m^2$ , similar to the previous two years. No

*Centrostephanus coronatus* were observed on quadrats or along the transect. *Strongylocentrotus* spp. were difficult to locate for size frequencies and only 93 *S. franciscanus* and 35 *S. purpuratus* were found. No sea urchin wasting disease was observed.

*Asterina miniata* density remained high and was similar to last year at 2.46/m<sup>2</sup>. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats and had densities of 0.38/m<sup>2</sup>, and 0.29/m<sup>2</sup> respectively, and were both higher than last year. *Pycnopodia helianthoides* remained relatively abundant with a density of 0.036/m<sup>2</sup>, similar to last year. No *Pachythyone rubra* were observed on RPCs this year. No sea star wasting disease was observed.

*Cypraea spadicea* density remained extremely low for this site at 0.042/m<sup>2</sup>. *Lithopoma undosum* continued to be rare with none observed on quadrats for the second consecutive year. *Megathura crenulata* were relatively rare and their density continued to decline to 0.0014/m<sup>2</sup>, the lowest density recorded at this site since monitoring for this species began in 1983. *Kelletia kelletii* density was 0.032/m<sup>2</sup>, notably higher than the previous five years. Similar to last year, *Aplysia californica* were rare and none were observed on band transects (0.0/m<sup>2</sup>). *Crassedoma giganteum* density remained relatively low for this site at 0.013/m<sup>2</sup>. *Tegula regina* were common and appeared to be the most abundant large snail at this site, similar to last year. We plan to add *T. regina* as one of our indicator species in 2005.

Similar to last year, fish were diverse but not very abundant. Adult *Chromis punctipinnis* were common on the Southern end of the transect with up to 77 observed, no juveniles were observed this year. Painted greenling, *Oxylebius pictus*, continued to be one of the most abundant fish with 75 observed. Twenty seven adult and 13 juvenile *Sebastes mystinus* were observed. Most of the adult *S. mystinus* were small and probably less than three years old. Adult *Sebastes atrovirens* were more abundant than last year with 18 observed and five juveniles were also observed, similar to last year. Many of the adult *S. atrovirens* were small and probably two or three years old. Seven adult *S. serranoides* and one juvenile *Sebastes serranoides/flavidus* were observed. Most of the adult *Sebastes serranoides* were small and probably only two to three years old, similar to the other rockfish species at this site. Two juvenile/YOY *Sebastes caurinus/carnatus*, copper/gopher rockfish, were also observed. Up to four adult *Sebastes carnatus* and four adult *Sebastes caurinus* were observed. Two adult and three juvenile *Sebastes serriceps* were observed. There were fewer juveniles than we observed last year. One adult *Hypsypops rubicundus* was observed this year. Kelp surfperch, *Brachyistius frenatus*, were abundant in the *M. pyrifera* canopy with up to 143 observed. However, one should note that divers typically only spend a few minutes swimming in the kelp canopy during fish counts and these were probably much more numerous. One adult *Girella nigricans* was observed. Similar to last year, *Paralabrax clathratus* were uncommon with only one adult observed. Seven adult and five juvenile *Embiotoca jacksoni* were observed. Five adult and eight juvenile *Embiotoca lateralis* were observed. No *Halichoeres semicinctus* were observed. Twenty adult and no juvenile *Oxyjulis californica* were observed. Small female *Semicossyphus pulcher* were common with 11 observed. Four small male and one juvenile *S. pulcher* were observed. *Coryphopterus nicholsii* density was similar to last year at 0.54/m<sup>2</sup>. No *Alloclinus holderi* were observed along the transect and none were observed on quadrats for the third consecutive year. Two large lingcod, *Ophiodon elongatus*, were observed. Roving diver fish counts were conducted on July 13<sup>th</sup> with five divers and on August 24<sup>th</sup> with four divers observing 23 and 27 species of fish, respectively.

All 14 ARMs were in good condition and were monitored for all indicator species. One *Haliotis assimilis* measuring 91mm was found in the ARMs this year for a density of 0.07/ARM, lower than last year. *Cypraea spadicea* density declined but remained high at 10.0/ARM. *Kelletia kelletii* density was 0.43/ARM, these have been more common in the ARMs over the past five years. No *Lithopoma undosum* or *L. gibberosum* were found in the ARMs this year. No *Megathura crenulata* were observed in the ARMs for the first time since 1993. This decline in density in the ARMs is similar to the decline we observed in the band transect data. *Crassedoma giganteum* density increased to 1.14/ARM and mean size decreased to 38.6mm indicating more recent recruitment. *Asterina miniata* mean density increased to 5.9/ARM, the highest since 1996 and mean size was 30.2mm, slightly higher than last year. *Pisaster giganteus* density also increased, and was 1.43/ARM, the highest since 1993. *Pisaster giganteus* mean size declined to 56.2mm indicating recent recruitment. *Pycnopodia helianthoides* mean density was 0.36/ARM similar to recent years. No small *Parastichopus parvimensis* <10cm were observed, and the mean density of >10cm was 0.36/ARM similar to recent years. *Strongylocentrotus franciscanus* density increased to 31.4/ARM and size decreased to 18.7 indicating more recruitment.

*Strongylocentrotus purpuratus* mean density increased slightly to 12.4/ARM and mean size was 18.9mm, similar to recent years. No *Centrostephanus coronatus* were observed in the ARMs for the third consecutive year.

The temperature loggers were retrieved, deployed, and all of the data were successfully downloaded.

## Location: Fry's Harbor, Santa Cruz Island

### Site #7 ANFH

2004 sampling dates: 7/15, 8/27.

2004 status: State of transition.

This site continued to change dramatically and had the most notable change of all the monitoring sites this year. Echinoderms declined dramatically and the site appears to be in a state of transition, possibly to a kelp forest. The most notable change was a dramatic decline in *Pachythyone rubra*, which have dominated much of the site since 1988. In addition *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* continued to decline and were recorded at their lowest densities at this site since monitoring began in 1982. There were noticeably more algae present at the site than in many years.

Macroalgae were common at the site and consisted mostly of juvenile *Eisenia arborea* and foliose red algae. Three subadult *Macrocystis pyrifera* were observed within a few meters of the transect, but no adults or juveniles were present. Subadult density was recorded at 0.005/m<sup>2</sup>, and was the first time since 1984 that adults or subadult were observed on quadrats at this site. Juvenile *E. arborea* were relatively abundant over most of the transect and several small adults were observed. Adult and subadult *E. arborea* densities were 0.0/m<sup>2</sup> and 0.79/m<sup>2</sup> respectively and cover was 1.3%. *Eisenia arborea* were abundant off the transect at depths above 20ft. Several *Cystoseira* sp. were observed along the transect for a cover of 0.2%, the highest cover recorded for this site since we began monitoring this species in 1985. Miscellaneous red algae cover was 24.5%, the highest at this site since 1982. Most of the red algae consisted of *Rhodymenia* sp. or similar algae. Green algae were common and consisted of *Codium fragile* and *Codium* sp. Articulated coralline algae cover was 1.2%, relatively high compared to recent years. Encrusting coralline algae cover was 33.0%, relatively low for this site. Bare substrate cover was 13.7%, similar to last year.

Miscellaneous invertebrates cover, excluding *Ophiothrix spiculata*, increased to 13.2%. The most common miscellaneous invertebrates in this category were hydroids, *Hydractinia milleri* and *Clavularia* sp. *Ophiothrix spiculata* cover continued to decrease and is described below in the echinoderm section. *Astrangia lajollaensis* cover was 14.7%, similar to recent years. No *Corynactis californica* were observed on RPCs for a cover of 0.0%, the lowest recorded at this site. *Balanophyllia elegans* cover was similar to last year at 0.5%. Miscellaneous bryozoan cover declined to 8.5%, but is still relatively high for this site. *Diaperoecia californica* cover also declined and was recorded at 3.3%. *Diaperoecia californica* were noticeably abundant on the sides of large boulders, but less abundant directly along the transect line. *Lophogorgia chilensis* were abundant on the offshore and deep side of the transect and had a density of 0.24/m<sup>2</sup>, similar to recent years. *Eugorgia rubens* were common on this side of the transect. *Tethya aurantia* were noticeably more abundant than in recent years and had a density of 0.011/m<sup>2</sup>, the highest since 1998.

*Strongylocentrotus purpuratus* density continued to dramatically decline for the second consecutive year and was recorded at 0.13/m<sup>2</sup>. *Strongylocentrotus franciscanus* density also continued to decline and was recorded at 0.083/m<sup>2</sup>. These were the lowest densities recorded at this site since monitoring began in 1982 for both of these species. *Centrostephanus coronatus* density remained low with none observed on quadrats this year (0.0/m<sup>2</sup>). *Lytechinus anamesus* densities continued to decline for the fourth consecutive year with none observed on band transects (0.0/m<sup>2</sup>), the lowest density recorded since 1984. Similar to other sites this year, juvenile *Strongylocentrotus* spp. were rare. No sea urchin wasting disease was observed.

*Ophiothrix spiculata* continued to decrease with a cover of 0.17%, the lowest since 1999. *Pachythyone rubra* were relatively rare at this site and their cover dramatically decreased to 0.83%, the lowest recorded since 1984. We believe the decline in *P. rubra* may be a result of predation by *Pycnopodia helianthoides*. *Pycnopodia helianthoides* were observed feeding on *P. rubra* at sites nearby Fry's Harbor in 2003 and their density has dramatically increased at this site. *Pycnopodia helianthoides* continued to be abundant and their density

remained high at  $0.067/m^2$ , the highest recorded at this site since monitoring for this species began in 1983. However, this density is lower than  $0.15/m^2$ , which is what we recorded at the end of summer last year as an extra sampling we did for this species since it was notably more abundant later on in the sampling season. This sampling was not included in the database since it was conducted after the regular density sampling, but it is mentioned in the 2003 trip and annual reports. *Pisaster giganteus* were abundant and were counted on both quadrats and 5m quadrats with densities of  $0.75/m^2$  and  $0.54/m^2$  respectively, and similar to last year. The density of *Asterina miniata* remained high and was similar to last year at  $1.67/m^2$ . *Parastichopus parvimensis* density dramatically declined to  $0.042/m^2$ , the lowest recorded at this site since monitoring began in 1982.

*Cypraea spadicea* density was  $0.88/m^2$ , similar to the past decade. *Lithopoma undosum* density remained at  $0.0/m^2$  and none were observed along the entire transect this year. This is the lowest abundance for this species that has been observed since monitoring began in 1982. *Kelletia kelletii* density was  $0.017/m^2$ , higher than the last several years, but similar to previous years. *Aplysia californica* density was  $0.011/m^2$ , relatively high compared to the past several years. *Megathura crenulata* density continued to decline for the third consecutive year and was  $0.017/m^2$ , the lowest density recorded since monitoring for this species began at this site in 1983. However, many of the *M. crenulata* observed were small indicating recent recruitment. *Crassedoma giganteum* density remained low at  $0.0083/m^2$ .

For a site with no kelp forest, this site continues to have a diverse assemblage of fish with up to 33 species observed, similar to last year.

Similar to last year the most abundant fish were adult *Chromis punctipinnis* and *Coryphopterus nicholsii*. Up to 390 adult *C. punctipinnis* were observed. No juveniles were observed on the roving diver fish counts this year, but recruitment of these may have occurred after our last fish count on August 27<sup>th</sup>. Painted greenlings, *Oxylebius pictus* were abundant with up to 60 observed. As usual for this site, large adult *Paralabrax clathratus* were moderately abundant when divers first entered the water, but they quickly scattered and seemed less abundant during the fish transects and roving diver fish count. Up to 11 adults and one juvenile *P. clathratus* were observed. Four adult and ten juvenile *Sebastes mystinus* were observed. No black rockfish, *Sebastes melanops* were observed this year. Adult and juvenile *Sebastes serriceps* were abundant with 13 adult and six juveniles observed. Four adult and zero juvenile *Sebastes atrovirens* were observed. Three adult gopher rockfish, *Sebastes carnatus*, were observed. Only nine adult and one juvenile *Oxyjulis californica* were observed. Two male and one female *Halichoeres semicinctus* were observed. Six small female, one small male and one juvenile *Semicossyphus pulcher* were observed. Seven adult *Hypsypops rubicundus* were observed. Four stripefin ronquils, *Rathbunella hypoplecta*, were observed. Fourteen adult and one juvenile *Damalichthys vacca* were observed. Three adult rubberlip surfperch, *Rhacochilus toxotes*, were observed this year. Two adult *Embiotoca jacksoni* were observed. Four adult *Medialuna californiensis* were observed. No *Lythrypnus dalli* were observed on quadrats for the fourth consecutive year. This has been the longest period that these have not been observed on quadrats, however one was observed during the roving diver fish count. Two zebra gobies, *Lythrypnus zebra*, were observed during the roving diver fish counts, these were less abundant than in recent years. *Coryphopterus nicholsii* continued to be relatively abundant at this site with a density of  $2.2/m^2$ , similar to the past two years. *Alloclinus holderi* density was  $0.083/m^2$ , similar to the last two years. Several small *A. holderi* were observed indicating recent recruitment. One lingcod, *Ophiodon elongatus*, was observed. Roving diver fish counts were conducted on July 15<sup>th</sup> with six divers and on August 27<sup>th</sup> with six divers observing 29 and 33 species of fish respectively.

Five intact ARMs (#2391, 2431, 2433, 2434, and 2435) were located and all five were monitored for all indicator species. One cage (ARM #2431) was replaced. ARM #2388 and 2432 were not located and are assumed destroyed. These two ARMs were in disrepair in 2003 due to a storm event.

No *Haliotis* spp. were found in the ARMs this year. *Cypraea spadicea* density increased to 7.6/ARM, similar to previous years. *Megathura crenulata* density remained low with only one small individual observed, 0.2/ARM. *Crassedoma giganteum* density was 1.6/ARM, relatively low compared to the past several years. *Asterina miniata* density increased to 15.8/ARM and mean size was relatively low at 32.6mm, possibly indicating recent recruitment. *Pisaster giganteus* density was similar to last year at 2.8/ARM and mean size increased to 61.9mm indicating little recruitment. *Strongylocentrotus* spp. remained at relatively low densities in the ARMs at this site. *Strongylocentrotus franciscanus* density decreased slightly to 11.4/ARM with a mean size of 29.0mm. *Strongylocentrotus purpuratus* density remained low but increased to 3.4/ARM and had a mean size of 19.6mm.

No *Centrostephanus coronatus* were observed in the ARMs for the second consecutive year. No *Parastichopus parvimensis* were observed in the ARMs this year, the lowest recorded since we began monitoring this species in the ARMs in 1996.

The temperature loggers were retrieved, deployed, and all of the data were successfully downloaded.

## Location: Pelican Bay, Santa Cruz Island

### Site #8 SCPB

2004 sampling dates: 7/14, 9/30.

2004 status: Dominated by *Strongylocentrotus purpuratus*.

This site has changed little and continues to be dominated by *Strongylocentrotus purpuratus* and is mostly devoid of macroalgae. *Macrocystis pyrifera*, *Pterygophora californica*, *Eisenia arborea*, *Laminaria farlowii*, *Cystoseira* spp., *Desmarestia* spp., and *Gigartina* spp. were all absent from the site. The most common foliose algae were the red alga, *Laurencia pacifica*, and the brown alga, *Colpomenia* sp., similar to last year. Miscellaneous red algae cover was 0.33%. Miscellaneous plants, consisting entirely of filamentous brown diatoms, were less abundant than last year with a cover of 0.33%, similar to other sites this year. Articulated coralline algae were rare, and were not observed on RPCs, with a cover of 0.0%. Encrusting coralline algae cover was lower than last year at 30.5%. Bare substrate cover correspondingly increased to 50.3%. This is the inverse of our observations with encrusting coralline and bare substrate in 2003. Sand cover reversed its decreasing trend and increased to 31.2% and probably was the reason for the changes in abundance of encrusting coralline and bare substrate.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, on RPCs increased to cover 12.0% of the bottom. Similar to past years, the most common miscellaneous invertebrate was *Spirobranchus spinosus*. *Astrangia lajollaensis* cover increased to 11.7%, similar to recent years. *Corynactis californica* and *Balanophyllia elegans* were rare with none observed on RPCs. *Serpulorbis squamigerus* were relatively abundant on the tops of large rocks, however they are typically rare directly along the transect and none were observed on RPCs, similar to past years. *Diaperoecia californica* was relatively common on the steep sides of large rocks on the inshore side of the line, but similar to previous years was relatively rare directly along the transect with a cover of 0.83%. Other bryozoans were relatively rare with a cover of 0.17%. *Lophogorgia chilensis* density was 0.19/m<sup>2</sup>, similar to recent years, but relatively high for this site.

*Strongylocentrotus purpuratus* density gradually declined for the third consecutive year, but remained high at 22.1/m<sup>2</sup>. *Strongylocentrotus franciscanus* density declined to 1.42/m<sup>2</sup>, the lowest recorded since 1993. Both *S. franciscanus* and *S. purpuratus* were out in the open and not confined to crevices. Juvenile *S. franciscanus* and *S. purpuratus* were rare indicating little recruitment. *Lytechinus anamesus* densities increased this year and they were counted on both quadrats and band transects. Their densities were 5.83/m<sup>2</sup> and 3.18/m<sup>2</sup> respectively. *Centrostephanus coronatus* density was 0.13/m<sup>2</sup>, similar to the last several years. Five *S. purpuratus* were observed with sea urchin wasting disease on August 12<sup>th</sup>. This was our first observation of this disease this year.

*Asterina miniata* density was lower than last year at 0.58/m<sup>2</sup>, but is still relatively high for this site. *Pisaster giganteus* remained relatively abundant for this site. They were counted on both quadrats and 5m quadrats, with densities of 0.042/m<sup>2</sup> and 0.1/m<sup>2</sup> respectively, similar to last year. *Parastichopus parvimensis* density remained low and was similar to last year at 0.17/m<sup>2</sup>. No sea star wasting disease was observed.

*Crassedoma giganteum* density was 0.018/m<sup>2</sup>, and remained near its lowest density recorded at this site in 2003. *Aplysia californica* density was 0.019/m<sup>2</sup>, the highest recorded since 1993. *Lithopoma undosum* density was the same as last year at 0.042/m<sup>2</sup>, remaining at the lowest recorded density at this site since monitoring began in 1982. *Kelletia kelletii* density was 0.0069/m<sup>2</sup>, similar to recent years.

For a site that is dominated by *Strongylocentrotus purpuratus*, this site continues to have a relatively abundant fish population with moderate diversity. *Coryphopterus nicholsii* continued to be the most abundant fish at this site with a high density at 5.0/m<sup>2</sup>, but declined from last year. Up to 470 were observed on a roving diver fish count. *Embiotoca jacksoni* were abundant with up to 37 adults and four juveniles observed. Thirteen adult and no juvenile *Damalichthys vacca* were observed, similar to last year. Adult rubberlip surfperch, *Rhacochilus*

*toxotes*, were common as usual at this site with five observed. *Hypsypops rubicundus* were relatively abundant with 17 adults and no juveniles observed, similar to last year. Adult *Chromis punctipinnis* were common and the second most abundant fish at this site with up to 331 observed. Juvenile *C. punctipinnis* were common during our September 30<sup>th</sup> fish count with 131 observed. No *Semicossyphus pulcher* were observed on either of the fish counts this year, and we considered them rare in 2003. *Oxyjulis californica* were rare with only one adult and 22 juveniles observed. One male, one female and two juvenile *Halichoeres semicinctus* were observed. This is the first time we have observed juveniles in recent years. Similar to previous year's adult *Paralabrax clathratus* were abundant and several were notably large. Up to 33 adult *P. clathratus* were counted during a fish count and juveniles were abundant during our second fish count on September 30<sup>th</sup> with 26 observed. This is the highest abundance of juveniles we have observed in probably over a decade. *Sebastes atrovirens* were less abundant than last year with four adult and no juveniles observed. No *Sebasteserranoides* were observed. Three adult and one juvenile *Sebastes serriceps* were observed, this is fewer juveniles than were observed last year, similar to what we have observed at other sites this year. No *Lythrypnus dalli* were observed on quadrats (0.0/m<sup>2</sup>) and only one was observed during the roving diver fish count on July 14<sup>th</sup>, similar to last year. *Alloclinus holderi* density continued to be low at 0.0/m<sup>2</sup>, similar to the past three years. Only one large *A. holderi* was observed during the roving diver fish count on July 14<sup>th</sup>. Roving diver fish counts were conducted on July 14<sup>th</sup> with six divers and on September 30<sup>th</sup> with four divers observing 22 and 18 species of fish respectively.

All six ARMs at this site were intact and sampled for all indicator species. One ARM cage was replaced. Octopi (probably *Octopus bimaculoides*) were common in the ARMs with four of the six ARMs having one in them. Two of the ARMs had egg masses in them.

Similar to previous years, the ARMs were relatively bare. No *Haliotis* spp. have been found in the ARMs since 1999. *Cypraea spadicea* density was similar to past years at 4.3/ARM. No *Lithopoma undosum* were observed in the ARMs for the third consecutive year. *Crassedoma giganteum* density was low at 2.83/ARM, higher than recent years. *Asterina miniata* density and size were 5.2/ARM and 39.0mm, similar to recent years. *Pisaster giganteus* density was relatively low at this site at 0.83/ARM and mean size increased to 94mm. *Lytechinus anamesus* density was 0.83/ARM. *Strongylocentrotus franciscanus* density and mean size was similar to the past two years at 12.3/ARM and 36.9mm, respectively. *Strongylocentrotus purpuratus* density and mean size also remained similar to last year at 17.5/ARM and 30.1mm. There were few small *Strongylocentrotus* spp. indicating little recruitment this past year. No *Centrostephanus coronatus* have been observed in the ARMs since 2000. *Parastichopus parvimensis* density <10cm was 0.33/ARM similar to last year and density >10cm increased to 0.83/ARM, still relatively low for this site.

The temperature loggers were retrieved, deployed, and all of the data were successfully downloaded.

## **Location: Scorpion's Anchorage, Santa Cruz Island**

### **Site #9 SCSA**

2004 sampling dates: 8/12, 9/17.

2004 status: Dominated by *Strongylocentrotus purpuratus*.

This site continued to change little and remains dominated by *Strongylocentrotus purpuratus*. Similar to past years, the site is almost completely devoid of macroalgae. No *Macrocystis pyrifera*, *Eisenia arborea*, *Pterygophora californica*, *Laminaria farlowii*, or *Cystoseira* spp. were present on quadrats or RPCs. However two *Cystoseira* sp. were observed along the transect, this species has not been observed here for many years. Miscellaneous red algae cover was much lower than the previous two years at 1.7%. This decline was a result in the decrease in the red alga *Laurencia pacifica*, which has declined at many of the other sites this year as well. Miscellaneous plants consisting of filamentous brown diatoms increased in cover to 15.8%. These diatoms were in several large patches mostly in low lying areas. Articulated coralline continued to be rare with none observed on RPCs this year, the lowest density recorded but similar to recent years. Encrusting coralline algae cover was 37.2%, similar to recent years. Bare substrate cover was 31.5%.

The most common miscellaneous invertebrate on RPCs was the Christmas tree worm, *Spirobranchus spinosus*, similar to past years. Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 12.3% of the bottom, similar to last year. *Serpulorbis squamigerus* continued to be relatively uncommon for this site and none were

observed on RPCs for the third consecutive year. Bryozoans were uncommon with a cover of 0.33%. There was some *Diaperoecia californica* present on the steep sides of the largest boulders around the transect, but none were observed on RPCs, similar to past years. Three small *Lophogorgia chilensis* were observed on band transects for a density of 0.0042/m<sup>2</sup>, similar to recent years at this site. *Tethya aurantia* density increased to 0.043/m<sup>2</sup>, the highest recorded density at this site since monitoring this species began in 1983.

*Strongylocentrotus purpuratus* continues to dominate this site but their density substantially decreased to 42.1/m<sup>2</sup>, the lowest since 1999. This site has the highest density of *S. purpuratus* of all the sites on Anacapa, Santa Cruz, Santa Rosa, and San Miguel Islands. *Strongylocentrotus franciscanus* density was 2.3/m<sup>2</sup>, similar to the past several years. *Centrostephanus coronatus* were present at the site, but none were observed in quadrats, similar to recent years. *Lytechinus anamesus* were rare and were counted in band transects and quadrats with densities of 0.013/m<sup>2</sup> and 0.083/m<sup>2</sup> respectively and similar to last year. Five *S. purpuratus* were observed with sea urchin wasting disease on August 12<sup>th</sup>.

*Asterina miniata* density remained relatively high for this site at 0.58/m<sup>2</sup>, similar to last year. Most of the *A. miniata* were noticeably large, also similar to last year. *Pisaster giganteus* counted on both quadrats and 5-meter quadrats and had densities of 0.042/m<sup>2</sup> and 0.07/m<sup>2</sup> respectively, similar to last year. Two *Pycnopodia helianthoides* was observed along the transect and both were in band transects for a density of 0.0028/m<sup>2</sup>, the first time these have been observed in band transects since monitoring began for them in 1983. No sea star wasting disease was observed on August 12<sup>th</sup>. *Parastichopus parvimensis* density was 0.25/m<sup>2</sup>, similar to recent years.

*Aplysia californica* were noticeably less abundant than in recent years at this site. Their density was 0.0042/m<sup>2</sup>, the lowest recorded since 1990. *Lithopoma undosum* were noticeably rare and continued their decline for the fourth consecutive year. Their density was 0.08/m<sup>2</sup>, the lowest recorded for this site since monitoring began in 1982. *Megathura crenulata* density was 0.082/m<sup>2</sup>, and has appeared to increase over the last several years. *Cypraea spadicea* density was 0.42/m<sup>2</sup>, similar to past years. *Crassedoma giganteum* density was 0.054/m<sup>2</sup>, similar to past years. Similar to last year, several *Panulirus interruptus* were observed around the transect, and one was observed on band transects for a density of 0.0014/m<sup>2</sup>.

Fish were moderately diverse but had relatively low abundances similar to past years. *Chromis punctipinnis* and *Coryphopterus nicholsii* continue to be the most abundant fish at this site. Up to 96 adult and 152 juvenile *C. punctipinnis* were observed. Adult *Hypsypops rubicundus* were common with up to 10 observed, no juveniles were observed. Up to 17 adult *Girella nigricans* were observed. *Embiotoca jacksoni* were moderately abundant with up to 28 adult and 8 juveniles observed. Five adult *Rhacochilus vacca* were observed. One adult rubberlip surfperch, *Rhacochilus toxotes* was observed. Painted greenlings, *Oxylebius pictus*, were common with 21 observed. Nine adult and three juvenile *Paralabrax clathratus* were observed. *Oxyjulis californica* were more abundant than last year with up to 70 adult and 303 juveniles observed. Similar to last year *Semicossyphus pulcher* were relatively rare with only two small females observed. Two female and one male *Halichoeres semicinctus* were observed. One small adult *Sebastes mystinus* was observed, similar to last year. One small adult *Sebastes serranoides* was observed. Two adult and two juvenile *Sebastes serriceps* were observed. Two adult black and yellow rockfish, *Sebastes chrysomelas*, and four adult *Sebastes atrovirens* were observed. No zebra gobies, *Lythrypnus zebra*, were observed, similar to the past two years. In the recent past these were common at this site. No *Lythrypnus dalli* were observed this year. *Coryphopterus nicholsii* density remained high for this site at 3.04/m<sup>2</sup>, similar to last year and the highest recorded at this site since monitoring for this species began in 1985. *Alloclinus holderi* continued to be rare with none observed on quadrats and only one on the August 12<sup>th</sup> roving diver fish count. Roving diver fish counts were conducted on August 12<sup>th</sup> with five divers and on September 17<sup>th</sup> with five divers observing 24 and 21 species of fish respectively.

All seven ARMs were intact and monitored for all indicator species. The cage for ARM #2382 was replaced and a new lid was installed on ARM #2425. ARM #2382, 2427 and 2425 had one layer of bricks that were covered in sand and were partially anoxic. One octopus was observed in the ARMs this year.

Similar to past years, the ARMs were relatively bare with few indicator species in them. No *Haliotis* spp. were observed in the ARMs, similar to past years. *Cypraea spadicea* were abundant as usual with a density of 15.3/ARM. *Lithopoma undosum* remained rare with a density of 0.14/ARM. *Crassedoma giganteum* density was 2.7/ARM, similar to past years. Six of the 19 *C. giganteum* were less than 20mm indicating recent recruitment.

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*Asterina miniata* density was 1.6/ARM and mean size was 58.4mm, both increases from last year and relatively high for this site. *Pisaster giganteus* density continued to decline and none were found in the ARMs this year (0.0/ARM), the lowest density since 2000. *Strongylocentrotus franciscanus* density continued to decline for the second year and was recorded at 5.14/ARM, the lowest since 1998. Their mean size was similar to the last two years at 42.9mm. No *Centrostephanus coronatus* were found in the ARMs for the fourth consecutive year. *Parastichopus parvimensis* <10cm were uncommon with 0.14/ARM, similar to last year and ones >10cm declined to 2.0/ARM, lower than the previous two years.

The temperature loggers were retrieved, deployed, and all of the data were successfully downloaded.

## Location: Yellow Banks, Santa Cruz Island

### Site #10 SCYB

2004 sampling dates: 7/12, 7/30, 9/16.

2004 status: Kelp forest.

The kelp forest at this site continued to mature since last year and is now a thick kelp forest with a canopy cover estimated to cover 90% of the transect on July 12<sup>th</sup>. The canopy was thick and created low light conditions on the bottom which appeared to be a limiting factor for understory, algae which decreased from last year. The kelp canopy in this area was expansive and extended offshore of the site about 300 meters, to the west 100 meters and east many hundreds of meters. This was the most extensive canopy cover observed in many years (early 1980's) in this area.

Adult *Macrocystis pyrifera* density increased to 0.16/m<sup>2</sup>, the highest recorded on 5-meter quadrats since this protocol was implemented in 1996. Subadult and juvenile *M. pyrifera* densities decreased to 0.53/m<sup>2</sup> and 0.042/m<sup>2</sup>, respectively, and cover decreased to 19.8%. Decreasing subadult and increasing adult densities is a typical pattern of a maturing kelp forest. Most of the *M. pyrifera* appeared healthy with few epiphytes growing on the blades in July. No adult or juvenile *Eisenia arborea* were observed on quadrats or RPCs. Adult and juvenile *Pterygophora californica* were common but densities were lower than last year at 0.50/m<sup>2</sup> and 0.29/m<sup>2</sup> respectively, and cover was also lower at 1.5%. Small *Cystoseira* sp. were present but noticeably less abundant than last year with a cover of 0.83%. Most of the adult *P. californica* and *Cystoseira* sp. appeared stunted and overall unhealthy. This may be a result of the low light condition caused by the thick canopy. *Laminaria farlowii* were less abundant than last year with only several juveniles observed with a density of 0.042/m<sup>2</sup>. Miscellaneous brown algae cover decreased to 0.17%. No Miscellaneous plants, which usually consist of brown filamentous diatoms, were observed on RPCs this year. Miscellaneous red algae were rare and none were observed on RPCs for the first time since monitoring began at this site in 1986. Articulated coralline algae cover was lower than last year at 1.7%. Encrusting coralline algae cover was 32.3%, lower than usual for this site. Bare substrate cover remained relatively low for this site at 19.3% similar to last year and the lowest recorded since 1994.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 37.5% of the bottom, the highest cover recorded at this site since monitoring began in 1986. Similar to last year, the most common miscellaneous invertebrate was the hydroid *Obelia* sp. These hydroids were covered with silt and difficult to distinguish without brushing away the silt, similar to what we have observed at this and other sites the past two years. Bryozoan cover was similar to last year with miscellaneous bryozoans and *Diaperoecia californica* covering 7.7% and 0.17% of the bottom. Tunicate cover was similar to last year at 1.3%. *Tethya aurantia* density was 0.028/m<sup>2</sup>, similar to recent years. *Lophogorgia chilensis*, *Muricea fruticosa*, and *M. californica* were all present and had densities of 0.12/m<sup>2</sup>, 0.0069/m<sup>2</sup>, and 0.014/m<sup>2</sup> respectively, similar to recent years. *Balanophyllia elegans* and *Astrangia lajollaensis* cover was 0.7% and 2.8% respectively.

*Strongylocentrotus purpuratus* density remained low for this site at 3.13/m<sup>2</sup>. *Strongylocentrotus franciscanus* density also remained low and was recorded at 0.17/m<sup>2</sup>, its lowest density since monitoring began at this site in 1986. Both *S. purpuratus* and *S. franciscanus* were confined to crevices and not out in the open. Many of the *S. purpuratus* were small (less than 20mm) and very light in color. *Lytechinus anamesus* density remained low and was similar to last year at 0.49/m<sup>2</sup>. *Lytechinus anamesus* were difficult to see on band transects since they were small and covered with rocks or debris. One of the band transect observers did not have a good search image for them and did not observe any on July 12<sup>th</sup> on the inshore side of the transect. We re-counted the band

transects on this side of the line on July 30<sup>th</sup> and these counts were used. The small *L. anamesus* present indicate recent recruitment. No *Centrostephanus coronatus* were observed on quadrats for the second consecutive year since we began monitoring this species in 1997. Juvenile *S. purpuratus* and *S. franciscanus* were uncommon indicating little recruitment, similar to what we have observed at most of the other monitoring sites this year. No sea urchin wasting disease was observed.

*Ophiothrix spiculata* were rare and their cover continued to decline with none observed on RPCs this year. *Asterina miniata* density continued to increase and was recorded at 1.3/m<sup>2</sup>, the highest density recorded at this site since monitoring began here in 1986. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats, with densities of 0.21/m<sup>2</sup> and 0.055/m<sup>2</sup> respectively, similar to recent years. *Pycnopodia helianthoides* were less abundant than last year with a density of 0.0028/m<sup>2</sup> and only several observed along the transect.

*Lithopoma undosum* remained at its lowest density recorded at this site 0.17/m<sup>2</sup>, similar to what we have observed at other monitoring sites. *Kelletia kelletii* density was 0.036/m<sup>2</sup>, similar to last year. *Megathura crenulata* density was 0.019/m<sup>2</sup>, like last year and smaller animals were common indicative of recent recruitment. *Crassidoma giganteum* density was 0.0042/m<sup>2</sup>. No *Aplysia californica* were observed on band transects this year. One 63mm *Haliotis rufescens* was found during size frequencies, notably this is the first *H. rufescens* found outside of the ARMs since 1996. One old *H. assimilis* shell measuring 36mm was observed next to an ARM. *Navanax inermis* and their eggs were relatively abundant along the transect this year.

Fish had lower diversity than last year, but similar to the previous year and overall fish abundance remained low. Fish were abundant in the kelp canopy and consisted mostly of kelp surfperch, *Brachyistius frenatus*, juvenile giant kelpfish, *Heterostichus rostratus* and top smelt, *Atherinops affinis*. However, the later two species were not observed during the roving diver fish counts. The most abundant fish at the site were *B. frenatus*, with up to 148 counted in one small area of the canopy. Three small adult *Paralabrax clathratus* were observed. No juveniles were observed during the roving diver fish counts or fish transects, but several were observed on July 12<sup>th</sup> and September 16<sup>th</sup>.

*Chromis punctipinnis* were relatively rare with a maximum of 14 adults observed during the roving diver fish counts. Three adult and one juvenile *Embiotoca jacksoni* were observed, similar to last year. Three adult and no juvenile *Damalichthys vacca* were observed. One adult *Hypsypops rubicundus* was observed. Up to 35 adult and no juvenile *Oxyjulis californica* were observed. Small female *Semicossyphus pulcher* were moderately abundant with up to 13 observed on July 12<sup>th</sup>, but only five were observed on July 30<sup>th</sup>, no males or juveniles were observed. Two female and two male *Halichoeres semicinctus* were observed. *Oxylebius pictus* (painted greenlings) were moderately abundant with up to 31 observed. Two adult and one juvenile *Sebastes atrovirens* were observed, notably fewer juveniles than observed last year. One adult and no juvenile *Sebastes serriceps* was observed, juveniles were also more common last year. One adult *Sebastes chrysomelas* (black and yellow rockfish) was observed. Up to seven adult *Sebastes serranoides*, and one juvenile *Sebastes serranoides/flavidus* was observed. One KGB juvenile *Sebastes spp.* was observed, notably few than last year. One juvenile *Sebastes miniatus* (vermillion rockfish) was observed this year. No *Sebastes mystinus* were observed this year. No *Lythrypnus dalli* were observed this year. *Coryphopterus nicholsii* density was lower than the last several years at 0.42/m<sup>2</sup>. No *Alloclinus holderi* were observed on quadrats for the second consecutive year and only one was observed on during one of the roving diver fish counts. A small school of about 37 *Aulorhynchus flavidus* (tubesnouts) was observed, these are unusual at this site. Roving diver fish counts were conducted on July 12<sup>th</sup> with four divers and on July 30<sup>th</sup> with four divers observing 18 and 21 species of fish respectively.

Along this transect there are three groups of five ARMs, one group at each end and one group in the middle of the transect. Because of the large number of *Strongylocentrotus spp.* in the ARMs we did not sample all of them for all indicator species. A total of 12 ARMs were sampled for all indicator species and the remaining three ARMs (one ARM from each of the three groups) were sampled for all indicator species except *Strongylocentrotus spp.* One cage (ARM #2361) was replaced this year

We observed one *Asterina miniata* with sea star wasting disease in an ARM. Gammarid amphipods were extremely abundant on the *Strongylocentrotus purpuratus* and *S. franciscanus* that were found in the ARMs.

There were fewer *Haliotis spp.* this year than in recent years. Only one *Haliotis assimilis* was found in an ARM and it measured 85mm, relatively large compared to previous *H. assimilis* found here. This was the first year since 1998 that no *H. rufescens* have been observed and the third consecutive year that no *H. corrugata* have

been observed. No other live *H. rufescens* or *H. corrugata* have been observed for several years in this area indicating that recovery of these species will not happen any time soon.

*Cypraea spadicea* density increased to 8.7/ARM, the highest since 1997. *Kelletia kelletii* were relatively common for the second consecutive year with a density of 1.3/ARM, the highest recorded at this site since we began monitoring the ARMs in 1992. *Lithopoma undosum* continued to be rare with a density of 0.07/ARM, similar to the last three years. *Megathura crenulata* density remained relatively high at 0.60/ARM, similar to last year. *Crassedoma giganteum* density was 1.0/ARM, similar to the past years. *Tegula regina* remain common in the ARMs with a total of eight observed and we may want to consider adding these to our indicator species. The measurements for these were 13, 14, 18, 33, 34, 38, 39, and 42mm. Octopuses were more abundant than last year with a total of four observed in the 15 ARMs. Three of these were probably *Octopus bimaculoides* and one was *Octopus rubescens*.

*Asterina miniata* were relatively abundant and their density increased to 8.0/ARM. Mean size was 22.8mm, similar to recent years. There was a notable recruitment event of *Pisaster giganteus*. *Pisaster giganteus* were relatively abundant with a density of 9.0/ARM and a mean size of 17.6mm. This is by far the highest density and smallest mean size of *P. giganteus* than we have observed at this site since monitoring began in 1992, indicating significant recruitment this year.

No *Lytechinus anamesus* were observed in the ARMs, the first time since 1998. *Strongylocentrotus franciscanus* density continued to increase and was 119.8/ARM, the highest density recorded at this site since we began monitoring this species in the ARMs in 1992. Mean size considerably increased to 36.2mm which is large for the ARMs at this site. This suggests that the increase in *S. franciscanus* in the ARMs is not a result of recruitment, but rather emigration possibly for the purpose of refuge. Similarly, *S. purpuratus* increased in density and size. *Strongylocentrotus purpuratus* density was 137.2/ARM, the highest since 1999 and mean size increased to 28.7mm the highest since 1998. Over the last several years that this site has progressed to kelp forest we have noticed a large decline in *Strongylocentrotus* spp. densities and shift from the sea urchins being out in the open to the utilization of crevice habitat. The ARMs act as crevices so we suspect greater use of the ARMs as preferred habitat. Greater use of crevices often suggests an increased abundance of food is available for the sea urchins. No *Centrostephanus coronatus* were observed in the ARMs this year. Small <10cm *Parastichopus parvimensis* were more abundant than the past several years with a density of 1.2/ARM, the highest density since 1999, and the density of large >10cm *P. parvimensis* was 0.33/ARM, similar to recent years.

The temperature loggers were working properly and all temperature data were successfully downloaded. Both loggers were recording temperatures within specifications of each other.

## **Location: Admiral's Reef, Anacapa Island**

### **Site #11 ANAR**

2004 sampling dates: 8/9, 8/10, 10/1.

2004 status: Dominated by *Ophiothrix spiculata* and in some areas *Strongylocentrotus purpuratus*.

The site has changed little from last year and continues to be dominated by echinoderms. *Ophiothrix spiculata* continued to carpet the bottom along most of the low lying bottom. In the high relief areas there tends to be a higher abundance of *Strongylocentrotus purpuratus* and the only considerable algae present at the site is on the tops of these high relief areas where few *S. purpuratus* are present.

There was slightly more *Macrocystis pyrifera* along the transect this year. Adult and subadult densities were 0.005/m<sup>2</sup> and 0.025/m<sup>2</sup> respectively and cover was 0.5%, all the highest since 1997. Juvenile *M. pyrifera* were common on tops of large rocks/reef and densities were 0.042/m<sup>2</sup>, the highest since 2000. Fifteen small subadult *Macrocystis pyrifera* plants were observed along the transect and measured for size frequencies. *Pterygophora californica*, *Laminaria farlowii*, *Agarum fimbriatum* and *Cystoseira* spp. were all absent from the transect, similar to recent years. Adult and juvenile *Eisenia arborea* were common on the tops of rocks along the eastern half of the transect. Adult and juvenile *E. arborea* densities were 0.13/m<sup>2</sup> and 0.083/m<sup>2</sup> respectively, the first time these have been observed in quadrats since 1997. Several small *Cystoseira* spp. were observed along the transect but none were observed on RPCs. Miscellaneous red algae cover decreased to 19.8%. *Laurencia pacifica* and

filamentous red algae were the most abundant in this category. Bare substrate increased and may be a result of the decrease in red algae as we thought the inverse relationship last year. Other plants, consisting of filamentous brown diatoms, covered 3.2% of the bottom, similar to recent years. Articulated and encrusting coralline algae cover was similar to last year at 0.33% and 33.8%, respectively.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 16.8% of the bottom, similar to last year. Most of this category consisted of *Spirobranchus spinosus*, similar to past years. *Ophiothrix spiculata* were separated out as a separate species this year and will be discussed under the echinoderm section below. *Lophogorgia chilensis* density remained relatively low at 0.057/m<sup>2</sup>, but similar to the previous four years. *Muricea fruticosa* and *M. californica* densities were similar to previous years at 0.0083/m<sup>2</sup> and 0.025/m<sup>2</sup> respectively. *Eugorgia rubens* were relatively abundant along the transect, and their density appeared similar to last year however, we do not monitor this species. *Corynactis californica* remained relatively abundant for this site with a cover of 3.0% similar to last year. *Astrangia lajollaensis* cover remained low for this site for the fourth consecutive year at 0.7%. *Balanophyllia elegans* remained uncommon and none were observed on RPCs for the fifth consecutive year. Miscellaneous bryozoans remained low with a cover of 1.8%. *Diaperoecia californica* was common on the steep sides of large rocks or reef and cover was 1.0%, similar to recent years.

Echinoderms continue to dominate this site with *Ophiothrix spiculata* being the most abundant and covering 39.3% of the bottom, similar to last year. *Ophiothrix spiculata* were most abundant along the eastern 2/3rds of the transect similar to recent years.

Sea urchin densities changed little this year. *Strongylocentrotus franciscanus* density was similar to last year at 3.8/m<sup>2</sup>, relatively low for this site. *Strongylocentrotus purpuratus* density also remained similar to last year at 6.2/m<sup>2</sup>. This density is very low compared to 1994-2002, but similar to the densities recorded between 1982-1993. Juvenile *S. purpuratus* and *S. franciscanus* were rare, indicating little recruitment. *Lytechinus anamesus* continued to be rare and were counted on band transects and quadrats with densities of 0.0028/m<sup>2</sup> and 0.0/m<sup>2</sup> respectively and similar to last year. *Centrostephanus coronatus* density remained relatively high at 0.75/m<sup>2</sup>, similar to the past four years. At most sites where *C. coronatus* recruited during the 1997/1998 El Nino we have observed declines, however this site the density has remained stable over the last several years. There has been no indication of much recent recruitment and most of these urchins are large so it looks like there is high survivorship here. No sea urchins were observed with wasting disease on July 10<sup>th</sup>.

*Pisaster giganteus* appeared more common than recent years with none observed in quadrats and a density of 0.045/m<sup>2</sup> on 5-meter quadrats, the highest density recorded since this protocol was implemented in 1996. *Asterina miniata* were relatively abundant for this site and their density increased to 1.9/m<sup>2</sup>, the highest recorded since monitoring began in 1982. *Linckia columbiae* were common on the western rocky end of the transect. *Parastichopus parvimensis* density remained relatively low for this site and was recorded at 0.5/m<sup>2</sup>, similar to the previous four years.

*Crassedoma giganteum* density appears to have continually declined over the past four years and was recorded at 0.026/m<sup>2</sup>, the lowest recorded since monitoring began in 1982. *Megathura crenulata* density remained relatively high compared to recent years at 0.097/m<sup>2</sup>. Small *M. crenulata* were noticeably more common than we have observed in the past, similar to what we have observed at other sites this year. *Aplysia californica* density was 0.029/m<sup>2</sup>, similar to the last two years. *Kelletia kelletii* density was 0.0083/m<sup>2</sup>, low compared to the past several years. No *Haliotis corrugata* were observed along the transect for the fifth consecutive year. No *Panulirus interruptus* were observed along the transect this year.

Fish continued to have relatively low abundance but a moderate diversity at this site that is mostly dominated by echinoderms. Similar to last year, the most abundant fish were adult *Chromis punctipinnis* and *Coryphopterus nicholsii*, however *Oxyjulis californica* were noticeably more abundant than last year. Adult *C. punctipinnis* were the most abundant fish with up to 800 observed. We observed the first juvenile *C. punctipinnis* this year at this site on August 9<sup>th</sup>, when only one was observed. Juvenile *C. punctipinnis* were common on October 1<sup>st</sup> with up to 150 observed. Two adult *C. punctipinnis* were observed with white spots that we believe is a bacterial infection caused by *Vibrio damsela* (Milton Love's personal communication). This infection has been observed frequently at this site in recent years. Small female *Semicossyphus pulcher* were moderately abundant with up to 15 observed. Two juvenile and no male *S. pulcher* were also observed. Two male and ten female *Halichoeres semicinctus* were observed, similar to last year. *Oxyjulis californica* were more abundant than in recent years with

up to 250 adults and 245 juveniles observed. Many of the juveniles were moderately large, nearing adult size of 10cm. Painted greenlings, *Oxylebius pictus* were abundant with up to 83 observed. *Paralabrax clathratus* were more common than last year with up to six small adults observed. Two adult and one juvenile *Sebastes mystinus* were observed. No *Sebastes serranoides* were observed. *Sebastes serriceps* were noticeably more abundant than last year with up to eight adult and five juveniles observed. One adult *Sebastes atrovirens* was observed. Adult *Damalichthys vacca* were common with up to 19 observed. Adult *Embiotoca jacksoni* were common with up to 12 observed. Adult halfmoons, *Medialuna californiensis*, were common with up to 16 observed. Eleven adult and no juvenile *Hypsypops rubicundus* were observed, similar to last year. Adult *Girella nigricans* were common with up to 18 observed. *Coryphopterus nicholsii* density was 1.9/m<sup>2</sup>, similar past years. *Alloclinus holderi* density continued to decrease and remained low at 0.042/m<sup>2</sup>. Up to 11 *A. holderi* were observed during a fish count, and all of these were large indicating little recent recruitment. California scorpionfish, *Scorpaena guttata*, were notably abundant with up to eight observed. Roving diver fish counts were conducted on August 9<sup>th</sup> with four divers and on October 1<sup>st</sup> with four divers observing 18 and 24 species of fish respectively.

All six ARMs at this site were monitored for all indicator species. No *Haliotis* spp. were observed in the ARMs at this site, similar to past years. *Cypraea spadicea* density was 1.0/ARM, similar to recent years. *Megathura crenulata* density was 0.50/ARM, similar to past years. *Crassedoma giganteum* density was 1.8/ARM, slightly higher than the last several years, but remained low compared to the 1990's. *Asterina miniata* density remained high and increased to 20.7/ARM, the highest recorded at this site. Mean size was similar to the past five years at 24.3mm. *Pisaster giganteus* continued to be rare with observed in the ARMs for the third consecutive year. *Lytechinus anamesus* continued to be rare with none observed in the ARMs for the second consecutive year. *Strongylocentrotus franciscanus* density was similar to the last several years at 13.8/ARM, but still was relatively low for this site. Their mean size continued to increase for the fifth consecutive year to 31.7mm indicating little recruitment. *Strongylocentrotus purpuratus* density continued to decline for the fifth consecutive year and was recorded at 7.5/ARM, the lowest density recorded in the ARMs at this site. Mean size has gradually increased over the past five years and this combined with decreasing density suggests little recruitment over the past five years. *Centrostephanus coronatus* density continued to decline for the sixth consecutive year, and none were observed in the ARMs for the first time since 1997. No *Parastichopus parvimensis* >10cm were found in the ARMs and the mean density of <10cm animals was 0.33/ARM similar to past year. No *Arbacia incisa* were found in the ARMs, the first time since the 1997/1998 El Niño when we believe they recruited to the site. No Octopus were found in the ARMs this year, similar to recent years.

The temperature loggers were retrieved and deployed and all data were successfully downloaded.

## **Location: Cathedral Cove, Anacapa Island**

### **Site #12 ANCC**

2004 sampling dates: 6/7, 8/10, 8/11, 8/13.

2004 status: Kelp forest.

There was noticeably more algae along the transect this year. *Macrocystis pyrifera* canopy cover was estimated at 25.0% and was mostly over the southern end of the transect, similar to past years. Adult *M. pyrifera* density was similar to last year while subadult, juvenile percent cover were higher than the past several years. Their abundances were 0.02/m<sup>2</sup>, 0.74/m<sup>2</sup>, 3.8/m<sup>2</sup>, and 10.3% respectively. Several adult and juvenile *Eisenia arborea* were observed on the tops of rocks, and adult and juvenile plants were abundant in the shallow areas above the North side of the transect. Adult *E. arborea* density was 0.083/m<sup>2</sup> and no juveniles were observed on quadrats. Adult and juvenile *Laminaria farlowii* were more common than last year with densities of 0.042/m<sup>2</sup> and 0.33/m<sup>2</sup> respectively. No *E. arborea* or *L. farlowii* were observed on RPCs this year. Small *Cystoseira* spp. plants were more abundant than in recent years with a cover of 8.8%, the highest since 1997. Miscellaneous brown algae cover was 10.7% higher than the last several years and consisted mostly of *Dictyota/Pachydictyon*. Miscellaneous red algae cover was 1.7%, lower than the last several years. Miscellaneous plants, consisting of filamentous brown diatoms covered 7.7% of the bottom, higher than last year. Articulated coralline algae cover was 10.8%, similar to the last two years, and still relatively low for this site. Encrusting coralline algae cover was 31.2%; about half of last years cover and relatively low for this site. There was an increase in sand cover which probably attributed for some of the loss. Bare substrate increased to 21.3%, higher than last year but similar to previous years.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 7.0% of the bottom, which was similar to last year but still relatively low for this site. The most common miscellaneous invertebrates were *Clavularia* sp. These were noticeably more abundant than in recent years. Miscellaneous bryozoans cover remained relatively high for this site at 7.8%, similar to last year. No *Diaperoecia californica* was observed on RPCs this year but it was common on the steep faces of large rocks or reef. Gorgonians were rare at this site, with only two *Lophogorgia chilensis* observed on band transects, 0.0028/m<sup>2</sup>. Sponge cover was recorded at 0.33%, lower than last year but similar to previous years. Tunicate cover was noticeably lower than the past several years at 0.5%.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* densities were similar to the last several years at 5.04/m<sup>2</sup> and 1.08/m<sup>2</sup> respectively. Similar to recent years, high density patches of *S. franciscanus* were scattered around the transect. Overall there were few *S. purpuratus* directly along the transect and these were confined in crevices. The larger *S. franciscanus* were mostly out in the open while the smaller ones were often in crevices. *Centrostephanus coronatus* density was 0.17/m<sup>2</sup>, higher than the last several years but probably just normal sampling variability as most were large and there was no indication of recruitment.

There was a notable decline in *Asterina miniata* abundance and their density decreased to 0.13/m<sup>2</sup>, a more normal density for this site. Last year, *A. miniata* were relatively abundant and were recorded at their highest density here. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.13/m<sup>2</sup> and 0.015m<sup>2</sup> respectively, similar to the past several years. *Parastichopus parvimensis* density was 0.92/m<sup>2</sup>, similar to last year.

*Lithopoma undosum* density was 2.1/m<sup>2</sup>, similar to last year but the lowest density since 1993. Small/juvenile *L. undosum* were less common than last year. *Crassedoma giganteum* density continued to decline for the third year and was recorded at 0.025/m<sup>2</sup>, the lowest recorded since monitoring for this species began at this site in 1983. *Aplysia californica* density was 0.017/m<sup>2</sup>. No *A. vaccaria* were observed this year. No *Haliotis corrugata* (0.0/m<sup>2</sup>) were observed during band transects for the fourth consecutive year, and none were observed along the entire transect for the third consecutive year. However, one was observed in the ARMs (see below). *Serpulorbis squamigerus* abundance remained low for this site and there were none observed on RPCs for the second consecutive year and second time since monitoring began in 1982. *Panulirus interruptus* density was 0.015/m<sup>2</sup>, similar to the last several years. *Kelletia kelletii* were rare with none observed on band transects.

Similar to past years, fish were abundant and diverse at this site. One tagged *Hypsypops rubicundus* was observed on June 8<sup>th</sup> around the 40-50 meter mark. We believe that this is one of the *H. rubicundus* that was tagged in 1985. Adult *H. rubicundus* were abundant with up to 20 observed. Up to 580 adult and two juvenile *Chromis punctipinnis* were observed on August 10<sup>th</sup>. *Embiotoca jacksoni* were abundant with up to 37 adults and 13 juveniles observed. Ten adult and no juvenile *Damalichthys vacca* were observed. *Brachyistius frenatus* were moderately abundant in the areas with thicker kelp canopy cover with 28 observed. Twenty five adult *Girella nigricans* were observed. Seven female, one male and two juvenile *Semicossyphus pulcher* were observed. Four female and one male *Halichoeres semicinctus* were observed. Fifty six adult and about 200 juvenile *Oxyjulis californica* were observed. Juvenile giant kelpfish, *Heterostichus rostratus* were abundant in the kelp canopy with approximately 375 observed on August 10<sup>th</sup>. Up to 18 adult and three juvenile *Paralabrax clathratus* were observed. Three adult and 10 juvenile *Sebastes atrovirens* were observed. One juvenile *S. mystinus* was observed. Small adult *Sebastes serranoides* were moderately abundant with 34 observed, and three juvenile *Sebastes serranoides/flavidus* were observed. Two adult and two juvenile *Sebastes serriceps* were observed. *Oxylebius pictus* were common with up to 26 observed. No *Lythrypnus dalli* or *L. zebra* were observed this year. *Coryphopterus nicholsii* remained relatively abundant for this site with a density of 0.88/m<sup>2</sup>. *Alloclinus holderi* density was 0.63/m<sup>2</sup>, similar to last year. Roving diver fish counts were conducted on June 7<sup>th</sup> with three divers and on August 10<sup>th</sup> with five divers observing 21 and 26 species of fish respectively.

All seven ARMs were monitored for all indicator species. Two octopuses were found in the ARMs this year. There are several changes in the ARMs at this site that are in parallel with the changes we have observed at Landing Cove.

One *Haliotis corrugata* was observed in the ARMs this year, 0.14/ARM, none were found the previous two years. The *H. corrugata* was 17mm indicating recent recruitment similar to the *H. corrugata* found at Landing Cove.

*Cypraea spadicea* density remained high at 13.0/ARM and these are relatively abundant compared to other sites. *Lithopoma undosum* density was 2.0/ARM, similar to past years. *Crassedoma giganteum* density was 3.3/ARM, similar to past years. *Asterina miniata* were abundant with a density of 17.0/ARM, the highest recorded at this site in the ARMs. Mean size of *A. miniata* was 28.6mm, similar to last year. *Pisaster giganteus* density was similar to last year at 4.3/ARM and mean size increased to 38.7mm. *Strongylocentrotus franciscanus* density notably increased to 100.4/ARM and mean sized decreased to 21.5mm, similar to Landing cove and indicative of recent recruitment. This is the highest density recorded in the ARMs since 1994. *Strongylocentrotus purpuratus* density declined slightly to 81.0/ARM with a mean size similar to last year at 38.1mm. No *Centrostephanus coronatus* were observed for the second consecutive year. Small *Parastichopus parvimensis* were common with a density of 4.7/ARM for animals <10cm similar to last year. However, large >10cm density declined to 5.4/ARM (in 2003 their density was 11.4/ARM).

The temperature loggers were working properly and all temperature data were successfully downloaded.

## Location: Landing Cove, Anacapa Island

### Site #13 ANLC

2004 sampling dates: 7/16, 8/11, 9/15.

2004 status: Kelp forest.

Canopy cover of *Macrocystis pyrifera* over the transect was estimated at 75%, notably high for this site. Similar to past years, canopy was thickest on the eastern end of the transect above the shallow reef. Similar to last year the middle of the transect had the highest abundance of juvenile and subadult *M. pyrifera*. All of the *M. pyrifera* appeared healthy with few epiphytes growing on the blades. Similar to previous years, the top of the reef at the east end of the transect had an abundant and diverse coverage of algae, while the deeper areas of the transect had noticeably more brown macroalgae.

Adult, subadult, and juvenile *M. pyrifera* densities were 0.13/m<sup>2</sup>, 2.0/m<sup>2</sup>, and 11.8/m<sup>2</sup> respectively. The adult and subadult densities were the highest recorded at this site since 1983, and juvenile density was the highest since 1986. Cover of *M. pyrifera* remained relatively high, but declined to 24.2%. Adult and juvenile *Eisenia arborea* densities were 1.0/m<sup>2</sup> and 0.5/m<sup>2</sup> respectively and similar to recent years. However, cover of *E. arborea* was relatively low at 9.3%, but was possibly just an artifact of sampling variability. *Pterygophora californica* was common in the deeper portion of the transect and mostly a few meters away from the transect where quadrats are conducted. *Pterygophora californica* adult and juvenile density were 0.042/m<sup>2</sup> and 0.083/m<sup>2</sup> respectively, and cover was recorded at 1.3%. Adult and juvenile *Laminaria farlowii* were abundant with densities of 2.0/m<sup>2</sup> and 21.0/m<sup>2</sup> respectively, and a cover of 16.5%. These were all some of the highest densities recorded at this site since monitoring began in 1982. Miscellaneous brown algae cover was lower than last year a 3.3%. *Cystoseira* spp. cover was similar to last year at 3.7%. *Gelidium* spp. cover was 20.2%, similar to the past 15 years. All of the *Gelidium* spp. was present on top of the reef at the eastern end of the transect, similar to previous years. Miscellaneous red algae cover increased from last year to 21.8%, but was still similar to past years. Most of the miscellaneous red algae was present on the top of the reef at the east end of the transect. Miscellaneous plants cover remained low at 0.17%, similar to what we have observed at other sites this year. Articulated and encrusting coralline algae covered 12.8% and 31.7% of the bottom respectively, similar to previous years. Bare substrate covered increased to 30.8%, the highest recorded at this site. There was an increase in sand cover to 18.5% which may have accounted for some of the bare substrate cover.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, cover was higher than last year at 9.0% and consisted mostly of hydroids. Miscellaneous bryozoans and *Diaperoecia californica* covers were similar to last year at 16.3% and 4.2% respectively. Most of the miscellaneous bryozoans on RPCs were *Membranipora* spp. that were encrusting the *Gelidium robustum* on the eastern end of the transect. Tunicates were noticeably less abundant than last year with a cover of 1.2%. Sponges were relatively abundant as usual for this site with a cover of 7.0%. *Corynactis californica* cover was similar to last year at 2.2%. *Lophogorgia chilensis* continued to be relatively abundant for this site with a slight increase in density to 0.015/m<sup>2</sup>, the highest density recorded at this site. Two small *Muricea fruticosa* were observed and their density though low was the highest recorded at this site, at 0.0042/m<sup>2</sup>. *Phragmatopoma californica* were common on the western end of the transect, but none were observed on RPCs.

Both *Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* densities were lower than the last several years at 2.29/m<sup>2</sup> and 2.58/m<sup>2</sup> respectively. *Centrostephanus coronatus* were common on the shallow reef on the eastern part of the transect, but none were observed in quadrats this year. *Parastichopus parvimensis* density was 0.88/m<sup>2</sup>, similar to recent years. Emergent *Asterina miniata* were rare as usual and none were observed on quadrats, similar to past years. Emergent *Pisaster giganteus* were also rare as usual and they were counted on quadrats and 5-meter quadrats for densities of 0.0/m<sup>2</sup>, and 0.005/m<sup>2</sup> respectively. No sea star wasting disease or sea urchin wasting disease was observed at this site.

*Haliotis corrugata* remained rare with none observed on band transects for the second time since monitoring began for this species in 1983. Only two large *H. corrugata* were observed along the transect on July 15<sup>th</sup>. One fresh *H. corrugata* shell measuring 35mm was found indicating some recruitment, but no other fresh shells and a few old shells were observed. *Lithopoma undosum* density was 1.46/m<sup>2</sup>, similar to last year. *Crassedoma giganteum* density was 0.31/m<sup>2</sup>, lower than last year. *Crassedoma giganteum* were abundant along the vertical walls at this site and were counted on both band transects and quadrats with densities of 0.25/m<sup>2</sup> and 0.71/m<sup>2</sup> respectively, both similar to last year. *Aplysia californica* density was 0.0028/m<sup>2</sup>. *Cypraea spadicea* density remained low at 0.042/m<sup>2</sup>. *Megathura crenulata* density was 0.026/m<sup>2</sup>, similar to recent years. The density of *Panulirus interruptus* was relatively high for this site at 0.040/m<sup>2</sup>. Several juvenile (probably one or two years old) *Panulirus interruptus* were observed along the transect this year.

Fish were so abundant and diverse at this site that we all had the impression we were diving in an aquarium. Up to 450 adult *Chromis punctipinnis* were observed. No juvenile *C. punctipinnis* were observed, however our last fish count was conducted on August 11<sup>th</sup> which may have been too early for juveniles this year. Adult *Hypsypops rubicundus* were abundant with up to 21 observed. *Embiotoca jacksoni* were moderately abundant with 19 adults and six juveniles observed. One *Embiotoca lateralis* was observed, similar to past years, but this species is not very common at Anacapa Island. Kelp surfperch, *Brachyistius frenatus*, were common in the kelp canopy with up to 80 observed. Adult *Girella nigricans* were moderately abundant with up to 26 observed. Three adult and no juvenile *Damalichthys vacca* were observed. Adult *Medialuna californiensis* were common with 11 observed. *Semicossyphus pulcher* were moderately abundant with eight female, four male, and two juveniles observed this year. The male and female *S. pulcher* were noticeably large compared to the other kelp forest monitoring sites. Several of the male and female *S. pulcher* were tagged. Four female, two male and nine juvenile *Halichoeres semicinctus* were observed this year. It has been at least several years since juveniles were observed. Adult *Oxyjulis californica* were common with up to 64 observed and juveniles were abundant with an estimated 731 observed on July 16<sup>th</sup>. *Paralabrax clathratus* were moderately abundant with up to 40 adults and two juveniles observed. Many of the adults were notably large, much larger than we observed at any of the other kelp forest monitoring sites. No *Sebastes mystinus* were observed this year. Two adult and nine juvenile *S. serriceps* were observed. Four adult and three juvenile *S. atrovirens* were observed. Three juvenile KGB (*Sebastes spp.*) were observed. Four adult *S. serranoides* and four juvenile *Sebastes serranoides/flavidus* were observed. Four juvenile Bocaccio, *Sebastes paucispinis* were observed. *Coryphopterus nicholsii* density was lower than last year at 0.46/m<sup>2</sup> but similar to previous years. *Alloclinus holderi* density was 0.29/m<sup>2</sup>, lower than last year, and up to 18 were observed during the fish counts, similar to last year. One *Lythrypnus dalli* and one *L. zebra* were observed this year, these were notably less abundant than last year. Roving diver fish counts were conducted on July 16 with six divers and on August 11<sup>th</sup> with five divers observing 25 and 26 species of fish respectively.

All seven ARMs were monitored for all indicator species. One cage was replaced (ARM #2416). Three octopuses were observed this year, two *Octopus bimaculoides* and one *O. rubescens*. *Tegula regina* were common with 14 (2.0/ARM) found in the ARMs. Their measurements were: 19,20,20,22,22,24,25,25,31,36,38,38,39, and 41, similar to last year.

Two *Asterina miniata* were observed with wasting disease in the ARMs. Four of 1,219 *Strongylocentrotus franciscanus* and 39 of 1,094 *S. purpuratus* were observed with black spot disease in the ARMs.

Four small *Haliotis corrugata* were found in the ARMs for a density of 0.57/ARM, the highest since 1996. These measured 19, 22, 29 and 31mm indicating recent recruitment. *Cypraea spadicea* density was 5.43/ARM, similar to the past several years. *Lithopoma undosum* were more common in the ARMs than last year with a density of 1.1/ARM. Similar to last year, two small *Megathura crenulata* were found in the ARMs, 0.29/ARM. *Crassedoma giganteum* density was 3.0/ARM, similar to previous years.

*Asterina miniata* density remained high in the ARMs at 12.6/ARM. The mean size of *A. miniata* was 24.3mm, similar to last year. *Pisaster giganteus* density was 2.0/ARM, similar to recent years and mean sized declined to 22.1mm.

*Strongylocentrotus franciscanus* density continued to increase dramatically to 174.1/ARM, the highest density recorded in the ARMs since we began monitoring them in 1992. The mean size of *S. franciscanus* decreased to 22.8mm indicating recent recruitment. *Strongylocentrotus purpuratus* density remained high at 156.3/ARM and mean size was 30.6mm, similar to last year. Similar to the previous three no *Centrostephanus coronatus* were observed in the ARMs. *Parastichopus parvimensis* density <10 cm was notably higher than last year at 4.9/ARM indicating recent recruitment, and *P. parvimensis* >10cm remained high at 4.4/ARM.

The temperature loggers were retrieved and deployed, and all data were successfully downloaded.

## Location: Southeast Sea Lion, Santa Barbara Island

### Site #14 SBSESL

2004 sampling dates: 6/9, 9/13.

2004 status: This site is dominated by *Ophiothrix spiculata*, *Strongylocentrotus purpuratus* and *S. franciscanus*.

In 2003, this site appeared to be transforming into a kelp forest for the first time since 1994. However, this trend did not continue and similar to the other two sites at this Island, this site reversed its recent trend of declining echinoderm densities and increasing algal coverage. *Strongylocentrotus purpuratus*, *S. franciscanus* and *Ophiothrix spiculata* all increased in density while algae decreased.

With the exception of encrusting and articulated coralline algae, all algae counted on Quadrats and RPCs declined this year. No algae were counted in quadrats this year. Several juvenile and one small subadult *Macrocystis pyrifera* plants were observed, but all were growing epiphytically on gorgonians, presumably where they were protected from *Strongylocentrotus* spp. No *M. pyrifera* was observed on quadrats or RPCs this year. Several juvenile *Eisenia arborea* were observed along the transect, but none were in quadrats or counted on RPCs and they were noticeably less abundant than last year. No *Desmarestia* sp., *Laminaria farlowii*, *Pterygophora californica* or *Cystoseira* sp. were observed this year. Miscellaneous brown algae declined and none were observed on RPCs. Miscellaneous red algae cover was 4.5%, a decline from last year (12.5%) and consisted mostly of *Laurencia pacifica*. Several *Gigartina corymbifera* plants were observed growing epiphytically on gorgonians, but none were observed on RPCs. Filamentous diatoms, recorded as miscellaneous plants, were rare and cover was 0.17%, low compared to the last several years. Green algae cover was 1.3% and consisted entirely of *Codium* sp., similar to the past several years. However, *Codium* sp. was noticeably less abundant than last year. Articulated and encrusting coralline algae covered 1.0% and 62.7% of the bottom respectively. Bare substrate covered 25.5% of the bottom, similar to previous years.

The most common miscellaneous invertebrates, excluding *Ophiothrix spiculata*, encountered on RPCs were hydroids and cover of this category was 5.8%, similar to last year. *Corynactis californica* cover was recorded at 1.3% relatively low compared to the last five years. *Astrangia lajollaensis* cover continued to be relatively low at 1.0%, similar to last year. *Balanophyllia elegans* cover remained low, similar to the previous six years. Tunicates were noticeably less abundant than in previous years and cover was recorded at 0.67%, the lowest recorded at this site since monitoring began in 1982. Similarly, miscellaneous bryozoans were also noticeably less abundant with a cover of 0.33%, the lowest since 2000. *Diaperoecia californica* were rare and cover declined to 0.0%, similar to previous years. *Tethya aurantia* density was 0.12/m<sup>2</sup>, similar to the last three years. *Lophogorgia chilensis* were relatively abundant with a density of 0.17/m<sup>2</sup>, similar to recent years. As usual for this site, *Muricea californica* were common, while *M. fruticosa* were rare. Their densities were 0.028/m<sup>2</sup> and 0.0028/m<sup>2</sup> respectively.

*Strongylocentrotus purpuratus* ended their third consecutive year of decline and dramatically increased from near 0.25/m<sup>2</sup> in 2003 to 18.5/m<sup>2</sup>, their highest density since 2001. *Strongylocentrotus franciscanus* continued to increase in density and were recorded at 13.0/m<sup>2</sup>, the highest density recorded at this site since monitoring began in 1982. Juvenile *S. franciscanus* were rare but juveniles *S. purpuratus* were common indicating some recruitment. *Lytechinus anamesus* density continues to be very low for this site at 0.0069/m<sup>2</sup>, similar to last year.

*Centrostephanus coronatus* density declined for the third consecutive year and was recorded at 0.21/m<sup>2</sup>, the lowest since 1996 when we began monitoring this species. Similar to recent years all of the *C. coronatus* were large adults with no small individuals observed indicating little recruitment. No sea urchin wasting disease was observed on June 9<sup>th</sup>. No *Arbacia incisa* were observed in quadrats or directly along the transect this year.

*Ophiothrix spiculata* increased in abundance with a cover of 31.8%. *Ophiothrix spiculata* were mostly present along the northern 60 meters of the transect and were rare along the remaining southern 40 meters where there tends to be more rocky relief.

*Asterina miniata* density was 0.46/m<sup>2</sup>, similar to the last several years and still relatively high compared to the past 23 years. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.042/m<sup>2</sup> and 0.080/m<sup>2</sup> respectively, similar to last year. No *Pycnopodia helianthoides* were observed on band transects this year (0.0/m<sup>2</sup>), but several were observed along the transect. No sea star wasting disease was observed on June 9<sup>th</sup>. *Parastichopus parvimensis* density was 0.29/m<sup>2</sup>, and remained near its lowest density at this site since monitoring began in 1982.

*Lithopoma undosum* density was 0.46/m<sup>2</sup>, similar to the previous three years. *Megathura crenulata* density was higher than the last several years at 0.011/m<sup>2</sup>. No live *Haliotis* spp. were observed for the tenth consecutive year. *Aplysia californica* density was 0.015/m<sup>2</sup>, higher than last year but still relatively low compared previous years. *Crassedoma giganteus* density was 0.0069/m<sup>2</sup>, similar to previous years. No pencil oysters, *Pteria sterna* were observed again this year for the second consecutive year indicating that they are possibly gone from this site. These are a warm water species that recruited here during the 1997/1998 El Niño.

Fish abundance and diversity were low at this site. Diversity was notably lower than in 2003, but similar to several years prior. The decline in diversity appears to parallel with a decline in algal abundance. Similar to last year, the most abundant fish along the transect were *Coryphopterus nicholsii*, *Oxyjulis californica* and adult *Chromis punctipinnis*. Adult *C. punctipinnis* were common on the southern half of the transect with up to 217 adults and 10 juveniles observed. Five adult *Hypsypops rubicundus* were observed, but no juveniles, similar to last year. Only one adult *Embiotoca jacksoni* was observed, fewer than last year. No *Girella nigricans* were observed. No *Paralabrax clathratus* were observed. No adult and 83 juvenile *Oxyjulis californica* were observed. Five small female and no male or juvenile *Semicossyphus pulcher* were observed. No *Halichoeres semicinctus* were observed this year. No *Sebastes* spp. were observed at the site this year. Painted greenling, *Oxylebius pictus*, were common with up to 29 observed, similar to last year. No juvenile or adult *Sebastes* spp. were observed this year. Eight ocean whitefish, *Caulolatilus princeps* were observed. Two california scorpionfish, *Scorpaena guttata*, were observed. Two Pacific angel sharks, *Squatina californica*, were observed on September 13<sup>th</sup> and one was observed on June 9<sup>th</sup>. We have had increased sightings of these over the past several years. *Coryphopterus nicholsii* density continued to decline for the second consecutive year and was recorded at 0.13/m<sup>2</sup>, the lowest recorded since 1987. Up to 145 *C. nicholsii* were counted during a fish count. *Alloclinus holderi* density was lower than last year at 0.13/m<sup>2</sup>, the lowest recorded since 1992. One large black sea bass, *Stereolepis gigas* was observed on June 9<sup>th</sup>, but not during the roving diver fish count. Roving diver fish counts were conducted on June 9<sup>th</sup> with five divers and on September 13<sup>th</sup> with three divers observing 10 and 13 species of fish respectively.

The temperature loggers were retrieved and deployed, and all data were successfully downloaded.

## **Location: Arch Point, Santa Barbara Island**

### **Site #15 SBAP**

2004 sampling dates: 6/8, 9/13.

2004 status: Dominated by *Strongylocentrotus purpuratus* and *S. franciscanus*.

This site reversed its recent trend of declining echinoderm populations and increasing algal coverage, similar to the other two sites at this Island. *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* dramatically increased while algae decreased in abundance.

The site continues to be dominated by *Strongylocentrotus spp.*, however the tops of rocks and meters 85-100 along the transect had a moderate amount of algae. *Macrocystis pyrifera* were rare and only several juvenile plants were observed. No *M. pyrifera* was observed on quadrats and cover was recorded at 0.17%. Small adult and juvenile *Eisenia arborea* were observed at 85-100 meters along the transect and was recorded at a density of 0.13/m<sup>2</sup> and 0.083/m<sup>2</sup> respectively, with a cover of 1.2%. Overall, this represents a decline in *E. arborea* abundance from last year. Two small adult *Laminaria farlowii* were observed in a quadrat for a density of 0.083/m<sup>2</sup>. No *Desmarestia spp.* was observed this year. Small *Cystoseira spp./Halidrys sp.* were present along the transect at meters 85-100; however none were observed on RPCs. Miscellaneous brown algae were less abundant with a cover of 3.7%. Cover of miscellaneous plants was significantly lower than last year at 1.0% and consisted of brown filamentous diatoms. Miscellaneous red algae cover was higher than last year at 22.5%, but similar to recent years. This category consisted mainly of *Laurencia pacifica*. *Gelidium sp.* was present on the tops of large boulders, but none was observed on RPCs. Articulated coralline algae cover was 3.2%, lower than last year. Encrusting coralline algae covered 53.8% of the bottom similar to previous years. Bare substrate cover was 16.7%, higher than last year.

The most common miscellaneous invertebrate, excluding *Ophiothrix spiculata*, encountered on RPCs was the hydroid, *Obelia sp.* similar to last year but they were noticeably less abundant. This category declined to cover 7.3% of the bottom. *Corynactis californica* cover was 2.2%, similar to last year. *Astrangia lajollaensis* were common in areas and had a cover of 0.2%, relatively low for this site, but possibly a sampling artifact caused by patchiness. Tunicate cover was lower than last year at 0.5%. Bryozoans were noticeably less abundant than last year. Miscellaneous bryozoans declined to cover 0.7%, lower than last year but similar to years prior to 2003. Similar to previous years, no *Diaperoecia californica* was observed on RPCs this year, but it was observed on the sides of the large rocks along the transect. *Lophogorgia chilensis*, *Muricea fruticosa*, and *M. californica* were all present, but rare as usual for this site. Their densities were 0.0014/m<sup>2</sup>, 0.0/m<sup>2</sup> and 0.0/m<sup>2</sup> respectively.

Similar to the other two sites at this Island, *Strongylocentrotus spp.* populations reversed their decreasing trends and dramatically increased this year. *Strongylocentrotus purpuratus* density increased to 46.1/m<sup>2</sup>, up from 3.87/m<sup>2</sup> in 2003. *Strongylocentrotus franciscanus* density also increased dramatically and was recorded at 33.0/m<sup>2</sup>, the highest recorded at this site since monitoring began in 1982. These increased densities are surprising since few juvenile *Strongylocentrotus spp.* were observed last year and their populations were declining overall. Juvenile *S. purpuratus* were common, but no juvenile *S. franciscanus* were observed this year. *Lytechinus anamesus* were uncommon with a density of 0.024/m<sup>2</sup>, similar to the last several years. *Centrostephanus coronatus* density was 0.21/m<sup>2</sup>, similar to last year. All of the *C. coronatus* were large adults with no small individuals observed indicating little recruitment. No sea urchin wasting disease was observed.

*Asterina miniata* and *Pisaster giganteus* densities continue to increase at this site and they were recorded at their highest densities since monitoring began in 1982. *Asterina miniata* density continued to increase for the third consecutive year to 2.2/m<sup>2</sup>. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.33/m<sup>2</sup> and 0.18/m<sup>2</sup> respectively. *Pycnopodia helianthoides* continued to be relatively common for this site with a density of 0.0028/m<sup>2</sup>. No *Ophiothrix spiculata* were observed on RPCs this year. *Parastichopus parvimensis* density was 0.13/m<sup>2</sup>, similar to recent years.

*Lithopoma undosum* density reversed its decline and increased to 1.3/m<sup>2</sup>, the highest density since 1999. Both large and small *L. undosum* were observed, indicating recent recruitment. No *Megathura crenulata* were observed on band transect this year (0.0/m<sup>2</sup>), not uncommon for this site. No live *Haliotis spp.* were observed. *Aplysia californica* were more abundant than last year with a density of 0.064/m<sup>2</sup>. *Crassedoma giganteus* density was 0.0056/m<sup>2</sup>, and this species appears to be gradually declining since 1995.

The most abundant fish at this site were *Oxyjulis californica* and *Chromis punctipinnis*. Adult *C. punctipinnis* were abundant as usual for this site with up to 450 observed. Juveniles were abundant during our September 14<sup>th</sup> fish count with up to 720 observed, notably more than last year at a similar date. As usual for this site, adult *Hypsypops rubicundus* were abundant with up to 48 observed. No juvenile *H. rubicundus* were observed this year. One tagged *H. rubicundus* was observed at meter 26 with a nest, nests were common along the entire transect. Up to 47 adult *Girella nigricans* were observed. Adult *Medialuna californiensis* were moderately abundant with up to 27 observed. Small adult *Paralabrax clathratus* were common with up to 12 observed. Painted greenlings, *Oxylebius pictus*, were common with up to 20 observed. Four adult and one juvenile *Embiotoca jacksoni* were observed. Adult *Oxyjulis californica* were common with up to 27 observed and juveniles

were abundant during both roving diver fish counts with up to 1,714 observed. Juveniles were noticeably more abundant than in 2003. *Semicossyphus pulcher* were moderately abundant but all adults were notably small. Four male, 13 female, and three juvenile *S. pulcher* were observed. Two male and one female *Halichoeres semicinctus* were observed. Two adult and no juvenile *Sebastes serriceps* were observed. One grass rockfish, *Sebastes rastrelliger*, was observed near the south end of the transect and it is possible that this is the same fish that has been observed in previous years. Two cabezon, *Scorpaenichthys marmoratus*, were observed. *Coryphopterus nicholsii* were common in the sandy areas on the offshore side of the transect, but few were present in quadrats with a density of 0.042/m<sup>2</sup>. *Alloclinus holderi* were common with up to 34 observed during a fish count. Many of these were small and more were observed during later fish count in September. *Alloclinus holderi* density was lower than last year at 0.38/m<sup>2</sup>. One large giant black sea bass, *Stereolepis gigas*, was observed on September 14<sup>th</sup>. Roving diver fish counts were conducted on June 8<sup>th</sup> with six divers and on September 14<sup>th</sup> with five divers observing 19 species on both counts.

The temperature loggers were retrieved and deployed. The temperature housing flooded so the back up HoboTemp Logger was destroyed but the waterproof Tidbit Logger was working properly and all data was successfully collected from this logger.

## Location: Cat Canyon, Santa Barbara Island

### Site #16 SBCAT

2004 sampling dates: 6/27, 9/13.

2004 status: Dominated by *Strongylocentrotus purpuratus* and *S. franciscanus*.

Similar to the other two sites at this Island, this site reversed its recent trend of declining echinoderm populations and increasing algal coverage. *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* dramatically increased in abundance while algae decreased. In 2003 this site was a developing kelp forest, however only 17 adult *Macrocystis pyrifera* plants were present this year. All of these plants had tattered holdfasts with an abundance of *Strongylocentrotus spp.* around them and the plants did not appear that they would persist much longer.

Macroalgae noticeably decreased at this site. No macroalgae was observed on quadrats or 5-meter quadrats this year. Seventeen *Macrocystis pyrifera* were within 10 meters of the transect line and were measured for size frequencies. No juvenile *M. pyrifera*, *Eisenia arborea*, *Pterygophora californica*, *Laminaria farlowii*, *Cystoseira sp.*, or *Desmarestia sp.* were observed along the transect this year. Miscellaneous brown algae cover was much lower than last year, but similar to previous years at 0.5%. Miscellaneous plants, usually consisting of brown filamentous diatoms, also declined dramatically and cover was recorded at 0.0%, the lowest since 1996. Miscellaneous red algae, mostly consisting of *Laurencia pacifica*, covered 8.0% of the bottom, the highest cover since 1997 but similar to last year. Articulated coralline algae cover decreased to 0.83%, much lower than last year, but similar to recent years. Encrusting coralline algae cover was 63.5%, similar to recent years. Bare substrate cover was recorded at 26.8%, higher than 2003, but similar to several years prior.

The most common miscellaneous invertebrates, excluding *Ophiothrix spiculata*, encountered on RPCs was the Christmas tree worm, *Spirobranchus spinosus*. This category covered 5.7% of the bottom, similar to recent years. *Astrangia lajollaensis* cover was 2.5%, similar to previous years. Tunicates were noticeably less abundant with a decrease in cover to 0.17%. The tunicate, *Pycnoclavella stanleyi*, was notably less abundant than last year. Miscellaneous bryozoan cover decreased to 0.83%, notably lower than last year. A small amount of *Diaperoecia californica* was observed on the steep sides of rocks, but none was observed on RPCs this year, similar to past years.

Similar to the other two sites at this Island, *Strongylocentrotus purpuratus* density dramatically increased to 42.6/m<sup>2</sup> (In 2003 density was recorded at 0.38/m<sup>2</sup>) reversing the recent trend of decreasing abundance. This is the highest density recorded for this species since 1990. *Strongylocentrotus franciscanus* density also dramatically increased to 19.1/m<sup>2</sup>, the highest density recorded since monitoring began at this site in 1986. Juvenile *S. purpuratus* were common indicating recent recruitment. *Lytechinus anamesus* were rare with a density of 0.0042/m<sup>2</sup>. No *Centrostephanus coronatus* were observed on quadrats for the first time since 1997 and only several were observed along the transect. No sea urchin wasting disease was observed at this site.

*Asterina miniata* and *Pisaster giganteus* continued to increase in density at this site and were at their highest abundances since monitoring began at this site in 1986. *Asterina miniata* density was 0.33/m<sup>2</sup>. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats for densities of 0.21/m<sup>2</sup> and 0.12/m<sup>2</sup> respectively. These are relatively high densities for this site. No *Ophiothrix spiculata* were observed on RPCs this year. No sea star wasting disease was observed. *Parastichopus parvimensis* density was 0.71/m<sup>2</sup>, similar to recent years, but the highest recorded density at this site.

*Lithopoma undosum* density increased to 0.46/m<sup>2</sup>. Both large and small individuals were common. *Cypraea spadicea* density was 0.083/m<sup>2</sup>, lower than last year but similar to years prior. *Megathura crenulata* density was 0.0014/m<sup>2</sup>, similar to last year but this species appears to have gradually declined over the past four years. No live *Haliotis* spp. were observed this year. *Aplysia californica* density increased to 0.072/m<sup>2</sup>. *Crassedoma giganteus* density was 0.0069/m<sup>2</sup>, similar to previous years.

*Chromis punctipinnis* and adult *Oxyjulis californica*, were the most abundant fish at this site. Up to 225 adult and 112 juvenile *C. punctipinnis* were observed. Adult *Hypsypops rubicundus* were moderately abundant as usual for this site with 24 observed. No juvenile *H. rubicundus* were observed. Up to seven adult *Medialuna californiensis* and up to eight *Girella nigricans* were observed. Two adult *Embiotoca jacksoni* were observed. One small adult *Paralabrax clathratus* was observed. Five small female, no male, and one juvenile *Semicossyphus pulcher* were observed. Adult *Oxyjulis californica* were moderately abundant with up to 190 observed and juveniles were abundant in September with up to 1150 observed. Two female and three male *Halichoeres semicinctus* were observed. Painted greenlings, *Oxylebius pictus*, were common with 15 observed, similar to last year. Two adult *Sebastes atrovirens* were observed. One cabezon, *Scorpaenichthys marmoratus*, was observed. *Alloclinus holderi* abundance declined with a density of 0.79/m<sup>2</sup>, and up to 21 were observed during a fish count. *Coryphopterus nicholsii* were less abundant than last year with a density of 0.042. Roving diver fish count was conducted on June 27<sup>th</sup> with five divers and on September 14<sup>th</sup> with five divers observing 21 species on both counts.

The temperature loggers were retrieved and deployed and all temperature data were successfully downloaded.

## Location: Northwest Harbor, San Clemente Island

### Site #17 CLNWH

2004 sampling dates: 6/24, 6/27

2004 status: Mature dense kelp forest.

Overall this site has not changed much since last year. The canopy cover at this site was estimated at 100% and was a little thicker than last year. *Macrocystis pyrifera* bottom cover was measured at 35.2%, up from 18.7% last year. Juvenile *M. pyrifera* density increased substantially to 17.8/m<sup>2</sup> from 2.04/m<sup>2</sup> last year, while subadults increased slightly to 0.72/m<sup>2</sup> and adults decreased slightly to 0.23/m<sup>2</sup>. *Eisenia arborea* were common in patches, with the cover increasing to 4% this year from 0.5% last year. Adult and juvenile *E. arborea* densities were 0.58/m<sup>2</sup> and 0.042/m<sup>2</sup> respectively. No *Pterygophora californica* was observed at the site, although a few juveniles were seen last year. Adult and juvenile *Laminaria farlowii* densities were 0.13/m<sup>2</sup> and 0.83/m<sup>2</sup> respectively, with none observed during RPCs; no adults were observed last year. *Cystoseira* sp. bottom cover was 0.33%. Miscellaneous brown algae cover was recorded at 6%, and included *Dictyota* spp., *Dictyopteris undulata*, and *Zonaria farlowii*. Miscellaneous red algae cover was again abundant and diverse, with a bottom cover of 43%. *Gelidium* spp. covered 7.5% of the bottom, with *Gelidium nudifrons* being common and *G. robustum* present. Articulated coralline algae cover stayed about the same as last year at 23.0%, while encrusting coralline algae decreased to 13.8%. Bare substrate covered 33.7% of the bottom, and the bottom along the transect consisted of 73.8% rock, 1.7% cobble, and 24.5% sand.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 0.8% of the bottom, down from 24.7% last year. The hydroid that was common last year, *Obelia* sp., was far less abundant this year. Hydroids, anemones and *Spirobranchus* sp. were the most common invertebrates observed during RPCs. Miscellaneous bryozoan cover was 2.7%, and *Diaperoecia californica* bottom cover was 0.67%. No *Corynactis californica* were observed this year; they were rare last year. *Balanophyllia elegans* were not observed on RPCs last year, but were rare

this year with a cover of 0.17%. *Astrangia lajollaensis* were common at 2.7% cover, an increase from last year. Sponge bottom cover was relatively abundant at 3.7%, with the most common being *Clathrina blanca*, *Hymenamphiasira cyanocrypta*, and *Verongia aurea*. No *Tethya aurantia* were observed this year, as was the case last year. Tunicate cover was 5.17% and like last year consisted mostly of *Didemnum* sp., *Distaplia*, *Aplidium* spp., and *Clavelina huntsmani*, as well as *Metandrocarpa taylori*. Similar to last year, no gorgonians were present at the site.

*Pisaster giganteus* were again common, with the density at 0.06/m<sup>2</sup> on 5 meter quadrats and 0.13/m<sup>2</sup> on quadrats. Forty five were measured for size frequencies, with the mean size at 97mm. No *Asterina miniata* were observed along the transect, although they were present at the site. No *Pycnopodia helianthoides* were observed. Like last year, the most abundant sea star at this site was *Linckia columbiae*.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* densities were 1.88/m<sup>2</sup> and 2.04/m<sup>2</sup> respectively. Both species were found in small crevices and were relatively large, with 231 *S. franciscanus* measured for size frequencies with a mean size of 88mm, and 113 *S. purpuratus* measured with a mean size of 47mm. Two *Centrostephanus coronatus* were located and measured, with a mean of 62mm; none were observed last year.

Six *Haliotis corrugata* were located for size frequencies, with a mean size of 128mm. One juvenile was located, measuring 27mm. Density was measured at 0.0014/m<sup>2</sup> on band transects. *Lithopoma undosum* density was 0.08/m<sup>2</sup> and 10 were located for size frequencies. They were large, with a mean of 94mm, and none measured under 70mm. *Kelletia kelletii* density was 0.027/m<sup>2</sup>, and an aggregation laying eggs was seen along the transect. Six were measured with a mean size of 111mm. *Megathura crenulata* continued to be relatively uncommon with a density of 0.0083/m<sup>2</sup>. *Serpulorbis squamigerus* were still common, with the bottom cover recorded at 2.0%. *Panulirus interruptus* density stayed about the same as last year at 0.044/m<sup>2</sup>.

This site had the lowest diversity of fish of the four San Clemente sites, with just 15 different species observed. The most abundant fish at this site were senioritas, *Oxyjulis californica*, with many adults and very small juveniles present. Adult *Chromis punctipinnis* were common, as were adult *Paralabrax clathratus*. Both male and female *Semicossyphus pulcher* were common, and two juveniles were observed. Similar to last year, small male *S. pulcher* were common, and several medium sized males were observed as well. There were a few adult *Hypsypops rubicundus* observed, but no juveniles. Several observers saw a single *Embiotoca jacksoni* and a single *Sebastes atrovirens*, and a few *Oxylebius pictus* and both male and female *Halichoeres semicinctus* were observed. *Coryphopterus nicholsii* and *Alloclinus holderi* were common with densities of 0.125/m<sup>2</sup> and 0.208/m<sup>2</sup> respectively. Several ocean whitefish, *Caulolatilus princeps*, were observed, as was one giant kelpfish, *Heterostichus rostratus*. The roving diver fish count was conducted on June 24, with 5 divers observing 15 species of fish.

## Location: Boy Scout Camp, San Clemente Island

### Site #18 CLBSC

2004 sampling dates: 6/22.

2004 status: Mature kelp forest with a thick understory.

Canopy cover was estimated at 100%, noticeably thicker than last year's 65%. The thick canopy and overcast conditions resulted in very dark working conditions underwater, so that we found it necessary to use underwater lights for several of the protocols. Bioluminescence was observed on the bottom at 7:00am. Large adult *Macrocystis pyrifera* were common, and in areas with more light subadults and juveniles were common. Adult, subadult and juvenile densities were 0.08/m<sup>2</sup>, 0.56/m<sup>2</sup> and 0.46/m<sup>2</sup> respectively, with bottom cover recorded at 12.8%. Adult and juvenile *Eisenia arborea* were common with densities of 0.38/m<sup>2</sup> and 0.34/m<sup>2</sup> respectively, and bottom cover was 2.3%. Like last year, no *Pterygophora californica* was observed along the transect. Adult and juvenile *Laminaria farlowii* were common with densities of 0.46/m<sup>2</sup> and 0.63/m<sup>2</sup> respectively and covered 4.7% of the bottom. A few *Cystoseira* spp. were observed on RPCs, for a cover of 1.8%. Adult and juvenile *Agarum fimbriatum* were common with densities of 0.46/m<sup>2</sup> and 0.17/m<sup>2</sup> respectively. Miscellaneous brown algae covered 22.8% of the bottom, down from 48.2% last year, and consisted mostly of *Dictyota* sp., *Pachydictyon* sp. and *A. fimbriatum*, which was counted as miscellaneous brown algae on RPCs. Green algae cover was recorded at

9.0% and consisted mostly of *Chaetomorpha spiralis*, which was moderately abundant on the western side of the transect. Miscellaneous red algae were common and covered 5.7%, down from last year's 12.0%. Both articulated and encrusting coralline algae covers were down from last year, at 1.3% and 32.3% respectively. Bare substrate cover was recorded at 27.0%, and the bottom along the transect consisted of 80.8% rock, 1.7% cobble, and 17.5% sand.

The most common miscellaneous invertebrates on RPCs were hydroids and barnacles. Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 5.7% of the bottom, an increase from last year's 0.83%. Miscellaneous bryozoans also increased from last year, up to 15.7%. Like last year, no *Diaperoecia californica* was observed. No *Balanophyllia elegans*, *Astrangia lajollaensis* or *Corynactis californica* were observed. Gorgonian densities were similar to last year, with *Lophogorgia chilensis* at 0.021/m<sup>2</sup>, *Muricea fruticosa* at 0.008/m<sup>2</sup> and *Muricea californica* at 0.06/m<sup>2</sup>. *Eugorgia rubens* were also common. Sponges covered 1.5% of the bottom, and *Tethya aurantia* were rare with a density of 0.0014/m<sup>2</sup>. Tunicate cover increased to 15.2% this year. *Diopatra ornata* bottom cover remained the same this year at 0.33%. *Macrocystis pyrifera* blades were abundantly covered with epiphytes.

No *Asterina miniata* were observed at the site. *Pisaster giganteus* continued to be rare with a density of 0.06/m<sup>2</sup> on 5 meter quadrats and none observed during quadrats. Not enough sea stars were present for size frequency measurements. Like last year, *Linckia columbiae* were common and this species was the most abundant sea star at the site. No sea star wasting disease was observed.

*Strongylocentrotus franciscanus* density was 0.83/m<sup>2</sup> and 115 were measured for size frequencies, with a mean of 89mm. Only one smaller than 50mm was found. *Strongylocentrotus purpuratus* were rare, with none observed on quadrats and only 4 observed and measured for size frequencies. *Centrostephanus coronatus* density was 0.17/m<sup>2</sup> and only 13 were measured for size frequencies, with a mean of 64mm. None less than 50mm were observed. No urchin wasting disease was observed.

Eleven *Haliotis corrugata* were located at the site and measured for size frequencies, with a mean size of 156mm. All were large, ranging from 121mm to 173mm. Several fresh, small *H. corrugata* shells were found measuring in the 80mm range. Old, large shells were common. *Lithopoma undosum* were present with a density of 0.13/m<sup>2</sup> as recorded on band transects. Eight were measured for size frequencies with a mean of 105mm. No *Kelletia kelletii* were observed, although they were fairly common at the other sites. One *Megathura crenulata* was observed on band transects, for a density of 0.0014/m<sup>2</sup>. Three *Crassedoma giganteum* were observed on band transects, for a density of 0.0042/m<sup>2</sup>. *Serpulorbis squamigerus* were common with a bottom cover of 6.5%. *Panulirus interruptus* were fairly common with a density of 0.0097/m<sup>2</sup>.

This site had the greatest diversity of fish of the four San Clemente sites. *Oxyjulis californica* adults were the most abundant fish observed during the fish count. *Semicossyphus pulcher* were common, juveniles as well as small males and females. *Chromis punctipinnis* adults were the most common fish observed on fish transects. Adult *Hypsypops rubicundus* were common but no juveniles were observed this year. *Sebastes atrovirens* and *Paralabrax clathratus* adults were common. A few adult *Embiotoca jacksoni*, *Sebastes serranoides*, *Girella nigricans*, *Sebastes serriceps*, and *Halichoeres semicinctus* (both male and female) were observed. *Lythrypnus dalli* were not observed on quadrats this year, but a few were observed during the fish count. One observer saw a few *Lythrypnus zebra*. *Coryphopterus nicholsii* density was 0.79/m<sup>2</sup> on quadrats, and they were common during the fish count. Only one *Alloclinus holderi* was observed during the fish count, and none during quadrats. A few *Brachyistius frenatus* and *Hypsurus caryi* were observed, and one *Caulolatilus princeps*, one *Scorpaena guttata*, and one *Heterostichus rostratus* were observed. A soupfin shark, *Galeorhinus galeus*, was observed. One giant sea bass, *Stereolepis gigas*, was seen at this site, but was not observed during the fish count. The roving diver fish count was conducted on June 22<sup>nd</sup> with five divers observing 21 species of fish.

## Location: Eel Point, San Clemente Island

### Site #19 CLEP

2004 sampling dates: 6/23, 6/25.

2004 status: Mature kelp forest with patches of high density subadult *Macrocystis pyrifera*.

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Overall the site was similar to 2003. Canopy cover over the transect was again estimated at 100% and it was notably thicker than last year, creating much lower light conditions on the bottom. The kelp forest at this site was typical of a mature kelp forest with large widely spaced *Macrocystis pyrifera* plants and relatively few subadult plants. *M. pyrifera* bottom cover was recorded at 21.0%; adult density was 0.28/m<sup>2</sup> and subadult density was 0.075/m<sup>2</sup>. Juvenile *M. pyrifera* were very abundant, with a density of 26.9/m<sup>2</sup>, an increase from last year's 8.9/m<sup>2</sup>. *Eisenia arborea* were less abundant than last year, with bottom cover recorded at 0.17%. No adult *E. arborea* were observed on quadrats, although they were common at the site, and juveniles were rare with a density was 0.04/m<sup>2</sup>. No *Pterygophora californica* were observed at the site. Adult and juvenile *Laminaria farlowii* were common, but not as abundant as last year when the cover was recorded at 12.8%; no *L. farlowii* were recorded on RPCs this year. Adult density was 0.04/m<sup>2</sup> and juvenile density was 1.8/m<sup>2</sup>, both a decrease from last year. There were a few small *Cystoseira* spp. plants with a cover of 0.17%. Miscellaneous brown algae covered 8.3% of the bottom, with *Pachydietyon* sp. and *Dictyota* sp. being moderately abundant. Miscellaneous red algae and articulated coralline algae continued to be abundant, with bottom covers of 41.0% and 35.5% respectively. Encrusting coralline algae cover decreased to 16.2% this year, from 35.0% last year. *Gelidium* sp. cover was the same as last year at 3.0%, with *Gelidium purpurescens* and *Gelidium nudifrons* being common. *Gigartina* sp. were present with a cover of 0.33%. Bare substrate covered 14.2% of the bottom, similar to last year. The bottom along the transect consisted of 86.7% rock, 5.7% cobble, and 7.7% sand.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 17.3% of the bottom, an increase from last year's 1.0%, with the most common invertebrate on RPCs being hydroids. Miscellaneous bryozoans were common, covering 3.5% of the bottom. No *Diaperoecia californica* were observed. *Balanophyllia elegans* were present covering 0.17% of the bottom. No *Corynactis californica* or *Astrangia lajollaensis* were observed. Like last year, there were no gorgonians at this site. Sponges were moderately abundant, covering 4.3% of the bottom. No *Tethya aurantia* were observed. Tunicates continued to be common, covering 3.2% of the bottom. *Diopatra ornata* covered 0.33% of the bottom. *Macrocystis pyrifera* blades were clean, with few epiphytes.

Similar to last year, no *Asterina miniata* were observed at this site. *Pisaster giganteus* continued to be common and densities were recorded as 0.02/m<sup>2</sup> on 5 meter quadrats and 0.08/m<sup>2</sup> on quadrats. Thirty seven were measured for size frequencies, with the mean at 98mm. As with the other sites, *Linckia columbiae* were the most common sea star again this year.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* were common, with densities similar to last year at 0.63/m<sup>2</sup> and 1.71/m<sup>2</sup> respectively. A total of 191 *S. franciscanus* and 136 *S. purpuratus* were measured for size frequencies, with a mean size of 92mm and 44mm respectively. Similar to last year, small individuals were rare. No *Centrostephanus coronatus* were observed.

*Haliotis corrugata* density was 0.0014/m<sup>2</sup>, with only two located for size frequencies, measuring 94mm and 122mm. One small fresh *H. corrugata* shell was found, measuring 77mm. *Lithopoma undosum* density was 0.08/m<sup>2</sup>, and like the other sites they were large, with a mean size of 91mm. Large *Kelletia kelletii* were common, with density recorded at 0.03/m<sup>2</sup>. Their eggs were moderately abundant. Twenty six were measured for size frequencies, with a mean of 111mm. None were measured under 100mm. *Megathura crenulata* were common with a density of 0.017/m<sup>2</sup>, with a mean size of 117mm for the 10 individuals measured. No *Crassedoma giganteum* were found on band transects this year. *Serpulorbis squamigerus* were again common, covering 6.7% of the bottom. *Phragmatopoma californica* were present, covering 0.5% of the bottom. *Panulirus interruptus* were more common than last year, the density increasing to 0.01/m<sup>2</sup>. *Parastichopus parvimensis* were common with a density of 0.46/m<sup>2</sup>.

Adult *Semicossyphus pulcher* and *Chromis punctipinnis* were the most common fish observed at this site. One observer saw a school of several hundred *C. punctipinnis* swim across the site. Both male and female *S. pulcher* were observed, as well as a few juveniles. The males at this site were larger than those observed at the other sites. A few adult *Hypsypops rubicundus* were observed, but no juveniles. Adult *Paralabrax clathratus* and *Oxyjulis californica* were also common. There were a few adult *Embiotoca jacksoni* and *Sebastes atrovirens*, and *Girella nigricans* were rare with one adult observed. Also rare were adult *Sebastes serranoides* and *Halichoeres semicinctus*, with only one or two observed. One observer saw a single adult *Sebastes serriceps*. Neither *Lythrypnus dalli* nor *Coryphopterus nicholsii* were observed on quadrats, and only one *C. nicholsii* was observed during the fish count. Three *Alloclinus holderi* were observed during quadrats for a density of 0.125/m<sup>2</sup>, but the highest count for this species during the fish count was two. Also present at the site with observations of single

adult individuals were *Hypsurus caryi*, *Sebastes carnatus*, *Brachyistius frenatus*, *Caulolatilus princeps*, and a bat ray, *Myliobatis californica*. The roving diver fish count was conducted on June 23 with 5 divers observing 19 species of fish.

## Location: Horse Beach Cove, San Clemente Island

### Site #20 CLHBC

2004 sampling dates: 6/25, 6/26.

2004 status: Mature kelp forest with patches of high density subadult *Macrocystis pyrifera*.

This site appeared to have changed little from last year. The site was typical of a mature kelp forest with large widely spaced *Macrocystis pyrifera* plants. Juvenile *M. pyrifera* was common in patches. Adult, subadult, and juvenile densities were 0.24/m<sup>2</sup>, 0.085/m<sup>2</sup>, and 5.67/m<sup>2</sup> respectively, and bottom cover was 13.7%. *Eisenia arborea* adults were present with a density of 0.042/m<sup>2</sup>, but no juveniles were recorded on quadrats this year. Bottom cover was 2.2%. *Laminaria farlowii* was also present but not very abundant, with an adult density of 0.084/m<sup>2</sup>, no juveniles, and a bottom cover of 1.3%. *Cystoseira* sp. were present but not very abundant, with a bottom cover of 2.5%, and the plants were small. No *Pterygophora californica* were observed on quadrats or RPCs this year. Miscellaneous brown algae covered 7.2% of the bottom, with *Dictyota/Pachydictyon* spp. again being the most common. *Gelidium* sp. and *Gelidium purpurescens* were also present but not very abundant, with *Gelidium* spp. covering 1.8% of the bottom. Miscellaneous red algae cover was abundant, recorded at 23.0%, most of which was very small filamentous or foliose algae. Articulated and encrusting algae were common covering 7.8% and 14.0% of the bottom respectively. Bare substrate covered 23.0% of the bottom. The bottom along the transect consisted of 72.8% rock, 11.2% cobble, and 16.0% sand.

The most common miscellaneous invertebrates on RPCs were hydroids. Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, cover was 27.8% of the bottom, up from last year's 12.7%. Miscellaneous bryozoans covered 4.5% of the bottom, and *Diaperoecia californica* covered 0.33% of the bottom, both down from last year. No *Balanophyllia elegans*, *Astrangia lajollaensis*, or *Corynactis californica* were observed at the site. Similar to last year, *Lophogorgia chilensis* and *Muricea fruticosa* were rare and *Muricea californica* was present, with densities of 0.0014/m<sup>2</sup>, 0.0014/m<sup>2</sup> and 0.061/m<sup>2</sup> respectively. *Muricea californica* were measured for size frequencies. Sponges were common, covering 2.5% of the bottom, and included *Clathrina blanca*, *Haliclona* sp., *Hymenamphistra cyanocrypta*, and *Lissodendoryx topsenti*. Several *Tethya aurantia* were observed on band transects, for a density of 0.0042/m<sup>2</sup>. Tunicates were abundant and covered 7.5% of the bottom, similar to last year. The most common were *Didemnum/Trididemnum* spp. and *Metandrocarpa taylori*. *Diopatra ornata* covered 1.5% of the bottom. *Tubularia* sp. were also common.

No *Asterina miniata* were observed. *Pisaster giganteus* were present with densities of 0.083/m<sup>2</sup> on quadrats and 0.02/m<sup>2</sup> on 5 meter quadrats. Sixteen were measured for size frequencies with a mean size of 116mm. The most abundant sea star continued to be *Linckia columbiae*. *Astrometis sertulifera* were common.

*Strongylocentrotus franciscanus* were the most abundant sea urchin with a density of 1.63/m<sup>2</sup>. We measured 111 for size frequencies and the mean size was 90mm. Only two were less than 50mm in size. *Strongylocentrotus purpuratus* density was recorded at 0.54/m<sup>2</sup>, with 25 measured giving a mean size of 49mm. None measured less than 35mm. No *Centrostephanus coronatus* were observed this year.

*Haliotis corrugata* were present with a density of 0.0042/m<sup>2</sup>. Only six were located for size frequencies, ranging from 94mm to 194mm with a mean of 148mm. Three fresh *H. corrugata* shells were measured at 80, 100, and 105mm. Last year 13 individuals were located. *Lithopoma undosum* density was 0.042/m<sup>2</sup> and 31 were measured. All were large, over 65mm, with a mean size of 89mm. *Kelletia kelletii* density was 0.022/m<sup>2</sup> and 10 were located for size frequencies. All were large, with a mean size of 126mm. *Megathura crenulata* density was 0.022/m<sup>2</sup> and 19 were measured with a mean size of 87mm. *Serpulorbis squamigerus* were abundant, with a bottom cover of 8.7%. Several octopuses were observed at the site. *Panulirus interruptus* were common with a density of 0.042/m<sup>2</sup>. Four *Crassedoma giganteum* were located this year and measured, ranging from 46mm to 78mm with a mean size of 63mm.

*Chromis punctipinnis* adults were the most abundant fish observed on roving diver fish count and fish transect. *Semicossyphus pulcher* were common, with almost equal numbers of males and females observed as well as 2 or 3 juveniles. *Oxyjulis californica* and *Paralabrax clathratus* adults were also common. *Hypsypops rubicundus* adults were common and were guarding nests at the site. A few *Halichoeres semicinctus*, both male and female adults, were observed. *Sebastes atrovirens* adults were relatively common and one or two *Sebastes serriceps* were observed. *Embiotoca jacksoni* adults were common. *Oxylebius pictus* were rare, with only one or two located. A few *Brachyistius frenatus* were observed in the kelp canopy. One or two *Medialuna californiensis* were also observed. One observer saw a bat ray, *Myliobatis californica*, and one saw a giant sea bass, *Stereolepis gigas*, on the fish count. Two giant sea bass were observed at the site on June 25<sup>th</sup> and one on June 26<sup>th</sup>. *Coryphopterus nicholsii* density as measured on quadrats was 0.58/m<sup>2</sup>. *Alloclinus holderi* density was 0.042/m<sup>2</sup>. Roving diver fish count was conducted on June 25<sup>th</sup> with four divers observing 16 species of fish.

## Survey Dives:

### Location: Wilson Cove, San Clemente Island

2004 sampling date: 6/27.

Two divers conducted a survey dive in Wilson Cove at the request of Les Stone, to see if the area was suitable for a new mooring. There was some confusion about the given coordinates, as they appeared to be onshore, but a telephone call to Tom Soder straightened it out. John Conti and Cyndi Dawson began the dive at the given coordinates and followed the edge of the kelp bed towards the pier and then inshore. The edge of the kelp bed consisted of *Macrocystis pyrifera*, *Laminaria farlowii*, *Pelagophycus pora*, and *Eisenia arborea*, and offshore was mostly sand with an occasional boulder. Cyndi Dawson said there appeared to be no issue for a mooring buoy to be placed there. However, inshore at about 35 feet where the dive terminated there was a small *Zostera* sp. bed. The coordinates for the dive were:

Beginning of dive	Middle	End of dive
N 33 00.450	33 00.431	33 00.387
W 118 33.275	118 33.339	118 33.378

### Location: Pyramid region, San Clemente Island

2004 sampling date: 6/26.

After completing our work at Horse Beach Cove, we moved to a site that John Conti knew about just southwest of Pyramid Head. It was an underwater arch at about 75 feet with a bottom of over 100 feet and the top at about 55 feet. A second survey dive was conducted nearby, just southeast of Pyramid Head(??), close to shore, in very calm conditions. The coordinates for the second dive are: 32 49.124 N; 112 20.931 W.

### Location: Webster Point, Santa Barbara Island

2004 sampling date: 6/28.

We anchored the boat in about 30 feet of water at the edge of the kelp around the inside ford area of Webster Point. Usually this area is rough, but it was calm this day. We descended to an urchin barren and swam towards shore through a relatively thick kelp forest composed mostly of small subadult plants and patches of mature *Eisenia*. The bottom was mostly rocky with small crevices and covered with encrusting coralline algae. There was a moderately high density of purple and red urchins everywhere. There were several large kelp bass and large male sheephead. No abalone were found. *Leucetta* sponge was more abundant than I have seen since 1982 and had isopods on it.



## DISCUSSION

In this section we attempt to summarize some general trends or describe the status of some species encompassing more than one site. However, these are only general trends and not a complete trend analysis for each of the indicator species as that is beyond the scope of this annual report. Unless otherwise noted when we mention increases or decreases compared to previous years, we are referring to the 16 original kelp forest monitoring sites established between 1982-1986.

### General Biology:

In 2004, mature *Macrocystis pyrifera* (giant kelp) forests were present at nine of the 16 original kelp forest monitoring sites. The remaining seven sites were dominated by echinoderms or in a state of transition. The mature kelp forests were present at Wyckoff Ledge and Hare Rock at San Miguel Island, Johnson's Lee North, Johnson's Lee South and Rodes Reef at Santa Rosa Island, Gull Island South and Yellow Banks at Santa Cruz Island, and Cathedral Cove and Landing Cove at Anacapa Island. Pelican Bay and Scorpion Anchorage at Santa Cruz Island were dominated by *Strongylocentrotus purpuratus*. Arch Point and Cat Canyon at Santa Barbara Island were dominated by *S. purpuratus* and *Strongylocentrotus franciscanus*. Southeast Sea Lion Rookery at Santa Barbara Island was dominated by *Ophiothrix spiculata*, *S. purpuratus* and *S. franciscanus*. Admiral's Reef at Anacapa Island was dominated by *O. spiculata* and *S. purpuratus*. Fry's harbor at Santa Cruz Island had no prominent dominant alga or invertebrate and appeared to be in a state of transition. In addition to the 16 original KFM sites, the Miracle Mile at San Miguel Island was a mature kelp forest and all four of the new sites at San Clemente Island were mature kelp forests.

At Santa Barbara Island, the kelp forests have decreased in abundance and size since 2003, unlike all the other Channel Islands where kelp forests continued to expand or are becoming denser. All three monitoring sites at Santa Barbara Island which had some degree of developing kelp forests in 2003 were dominated by echinoderms this year. Most notable was the reverse of the recent rapid decline in sea urchin densities and 2004 marked a dramatic increase of both *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* at all three sites. Corresponding to the increase in *Strongylocentrotus* spp. a decrease in macroalgae abundance occurred and with that our recent hopes of kelp forests returning to these sites in the near future. Similar to 2002, all three sites are again nearly devoid of macroalgae. All three sites were dominated by *S. purpuratus* and *S. franciscanus* and Southeast Sea Lion continued to have an abundance of *Ophiothrix spiculata* which also dominated much of this site. Overall, we feel that these three sites represent the Island well. It appears that most of the Island is dominated by the three species of echinoderms that dominate the three monitoring sites. Similar to recent years, the only canopy forming kelp forests around the Island were near shore around Sutil Island and close to the shallow areas predominantly on the west side of the Island. In addition, the reef about a quarter of a mile east of Arch Point also appears to be a developing kelp forest.

The three KFM sites at Anacapa Island appear to represent the Island well and have changed little from last year. Overall, there was noticeably more *Macrocystis pyrifera* than last year. *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* densities remained similar or declined slightly at all three sites. Admiral's Reef remains dominated by *Ophiothrix spiculata* and continues to have a low abundance of algae. Algae abundance notably increased at Cathedral Cove and Landing Cove compared to the past few years. There were notably more algae in other inshore areas around Anacapa this year. However, *S. purpuratus* and *O. spiculata* still appear to dominate many areas along the south side of East Anacapa, and both the south and north sides of middle and West Anacapa Island. Unlike Santa Barbara Island, we did not observe the dramatic increases in *Strongylocentrotus* spp. abundance at Anacapa Island.

The kelp forests at Santa Cruz Island continue to expand. *Strongylocentrotus* spp. densities have decreased over the past several years and continued to do so this year, but at a slower rate. *Strongylocentrotus purpuratus* densities continued to decline at three sites and remained the same at the two sites where they have recently become relatively rare. *Strongylocentrotus franciscanus* densities remained about the same at all five monitoring sites this year. In 2004, two of the sites were dominated by echinoderms (both by *Strongylocentrotus purpuratus*), one less than in 2003. Gull Island South remained a mature kelp forest and Yellow Banks is a kelp forest. Echinoderms have notably decreased at Fry's Harbor, and this site appears to be in a state of transition, possibly to kelp forest. Scorpion Anchorage and Pelican bay both remain dominated by *S. purpuratus*, though

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their densities are much lower than in recent years. The western third of the Island is under represented by our monitoring program as we don't have any sites west of Gull Island South. However, the kelp forests on that end of the Island appear to be increasing as there has been a notable increase in *M. pyrifera* canopy cover over the past several years.

Kelp forests continued to be abundant and continued to increase in abundance and denseness around Santa Rosa and San Miguel Islands. In 2004 mature kelp forests were present at all five of the original kelp forest monitoring sites at these Islands, compared to four in 2003. In addition, the relatively new monitoring site, Miracle Mile remained a mature kelp forest. Similar to what has been observed at many of the other Islands, *Strongylocentrotus* spp. densities ceased their decline over the past several years. *Strongylocentrotus purpuratus* densities increased at two sites and remained about the same at three. *Strongylocentrotus franciscanus* densities increased at one site decreased at one and remained about the same at three sites.

This is the second year we conducted kelp forest monitoring at San Clemente Island as part of an agreement with the U.S. Navy. Future monitoring at San Clemente Island will be contingent upon additional funding from the Navy. In 2004, the four monitoring sites at San Clemente Island all remained mature kelp forests. Similar to last year, there was an abundance of kelp forest around the entire Island and the canopy was notably thicker than in 2003. There were no outstanding changes at the four monitoring sites this year. We observed more juvenile *Paralabrax clathratus* at San Clemente this year, and presume that these recruited out later on in the summer of 2003.

With the exception of Santa Barbara Island, *Macrocystis pyrifera* was noticeably more abundant this year. Overall, at the sites where *M. pyrifera* canopy was thick, there were noticeably less understory algae which is most likely a direct result of low light conditions on the bottom created by the canopy. The "Miscellaneous Plants" category on RPCs that consist almost entirely of brown filamentous diatoms were noticeably less abundant than last year. The red alga, *Laurencia pacifica*, which is often moderately abundant at the sites that are dominated by *Strongylocentrotus* spp., was also notably less abundant than last year.

There was a notable increase in *Tethya aurantia* densities. There were increases at six sites and the remaining 10 sites had little or no change. The most noticeable increases in density were at Gull Island and Yellow Banks at Santa Cruz Island, both of these sites are rapidly maturing kelp forests and were recently dominated by *Strongylocentrotus* spp.

This year marked the end of the overall decline in sea urchins observed over the previous three years. This year we began observing increases at some of the sites, but mostly at Santa Barbara Island. *Strongylocentrotus purpuratus* densities increased at four sites, decreased at four sites, and remained about the same at eight sites this year. *Strongylocentrotus franciscanus* densities increased at three sites and remained about the same at 13 sites. *Lytechinus anamesus* densities remained about the same at all 16 sites this year. *Centrostephanus coronatus* are mostly present at Santa Barbara, Anacapa and the east end of Santa Cruz Islands. At these sites they remained at low densities or declined slightly.

Overall, in 2004 *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* recruitment remained low for the fourth consecutive year. There was no significant recruitment of *Centrostephanus coronatus* in 2004 and we expect this warm water species to continue to gradually decline in abundance unless there is another recruitment event. This species normally recruits at Santa Barbara, Anacapa and Santa Cruz Islands during anomalous warm water events such as El Niño's. The most recent "large-scale" recruitment event for this species was observed during the 1997/1998 El Niño and several years following this species have been in gradual decline. However, in 2004 we did observe several juvenile *C. coronatus* off the Yellow Banks area.

Sea urchin wasting disease (Lafferty and Kushner, 1999, and Richards and Kushner, 1992) prevalence remained low in 2004. The disease was observed at three sites in 2004 compared with two in 2003. Diseased *Strongylocentrotus purpuratus* were observed at all three sites (Pelican Bay, Scorpion anchorage and Admiral's Reef), *Strongylocentrotus franciscanus* was observed at Admiral's Reef and *Lytechinus anamesus* was observed at Pelican Bay.

Overall, there were fewer changes in *Pycnopodia helianthoides* densities compared to the previous several years and they remain moderately high at most sites where they are typically present. In 2004 almost all of the

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densities were similar to 2003 with an increase in density at two sites, a decrease at one site and little or no change at the remaining 13 sites. At Fry's Harbor, *P. helianthoides* appears to be having a dramatic effect on other echinoderm populations. *Pycnopodia helianthoides* continues to appear as the controlling factor in sea urchin populations at the northern Channel Islands. *Pycnopodia helianthoides* recruitment was noticeably high at Hare Rock and Rodes Reef, and to a lesser extent at other sites this year.

Increases in *Asterina miniata* density were not as common as in the previous four years. Their density increased at four sites, decreased at one site and had little or no change at the remaining 11 sites. *Pisaster giganteus* densities remained the same or declined, and there were no increases for the first time in five years. Their densities decreased at four sites and had little or no change at the remaining 12 sites.

There was a notable sea star wasting disease event in 2004. This disease event was the most prevalent since the 1997/1998 El Niño when a large disease event occurred that almost completely wiped out populations at the southern and eastern part of the Southern California Bight (Eckert et. al., 1999). Sea star wasting disease was observed at nine sites this year compared to two sites in 2003. The disease was observed at Santa Barbara, Anacapa and Santa Cruz Islands. Diseased *Asterina miniata* were observed at eight sites and diseased *Pisaster giganteus* at five sites. With the exception of a wasting disease observation at Fry's Harbor in July, all of the other observations took place after September 13<sup>th</sup>. We will not be able to retrieve the temperature data until the summer of 2005 when we read the temperature loggers, but it appears that a warm water event that lasted several weeks in August is when this widespread wasting disease event began. The warm water event was relatively short and we estimate that at most places less than 25% of the sea stars were affected. We don't expect that this disease event will cause the high mortality that occurred during the 1997/1998 disease event because of the shorter duration of the anomalously warm water. However, we do expect to see declines in densities from this event, though these will not be detected until 2005 since the disease event happened after we conducted our density measurements in 2004.

Overall, *Ophiothrix spiculata* abundance remained similar to last year and does not appear to be increasing. At the three sites where they were notably abundant in 2003, their cover declined at one, increased at one and remained about the same at one. These three sites were Fry's Harbor, Admiral's Reef and Southeast Sea Lion respectively.

*Corynactis californica* cover was similar to last year, ending its two consecutive years of notable decline. Its current cover is similar to past years.

Miscellaneous bryozoans ended their two years of dramatic increase this year. They increased at one site, decreased at nine sites, and remained about the same at six sites. Overall, *Diaperoecia californica* cover remained about the same with increases at four sites, decreases at two sites, and remained about the same at 10 sites.

*Lithopoma undosum*'s dramatic decline over the past four years subsided this year. Their densities decreased at three sites, increased at two sites, and changed little or remained about the same at the remaining 11 sites. The pattern in density changes we have recently observed of increasing abundance post the 1997/1998 El Niño followed by a rapid decrease is similar to what was observed post the 1982/1983 El Niño. This species associated with El Niño has recently been described in Zacharias and Kushner, 2006.

*Megathura crenulata* continued to decline overall. Density decreased at six sites, increased at four, and remained about the same at five sites. Density declines were more prevalent at San Miguel, Santa Rosa and Santa Cruz Islands, while increases were more prevalent at Anacapa and Santa Barbara Islands.

Similar to recent years, *Haliotis spp.* continues to be rare at most of the monitoring sites. Wyckoff Ledge at San Miguel Island is the only original kelp forest monitoring site that has a significant abalone population. The Miracle Mile site near Wyckoff Ledge that was installed to monitor *H. rufescens* also has a large population; however this site was purposefully installed in an area with high *H. rufescens* density in 2001. These two sites continue to be the only monitoring sites that have a *Haliotis spp.* population that we consider healthy and not extremely low or in decline. At Wyckoff Ledge, the density of *H. rufescens* remained high and was near the highest recorded since monitoring began at this site in 1983. At Miracle Mile, the density of *H. rufescens* remained high, but continued to decline. A decline is not surprising since this site was specifically set up in an area that had an unusually high

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density of *H. rufescens* (Marshall, 2002). It appears that the *H. rufescens* at Miracle Mile have moved further away from the transect, and movement may be the cause of this decline. *Haliotis rufescens* recruitment at the regular 16 kelp forest monitoring sites was notably lower than the past several years with none less than 51mm observed in the ARMs this year. However, recruitment (<51mm) in the ARMs at Miracle Mile, was higher than 2003 with 13 found in the seven ARMs. This appears to be a moderately high level of recruitment, but this is only the third year we have monitored this site and is really too small of a baseline for comparisons.

Similar to recent years, *Haliotis corrugata* continue to be extremely rare at all of five of the Park Islands. The only adult *H. corrugata* observed at the monitoring sites observed this year were three at Landing Cove, Anacapa Island. Though recruitment remained low, it was higher than the past several years with five juvenile (<51mm) *H. corrugata* observed in the ARMs this year. We began monitoring at four sites at San Clemente Island in 2003 and there continues to be a moderate number of *H. corrugata* there. Densities at the four sites there ranged from 0.0014/m<sup>2</sup> to 0.011/m<sup>2</sup>, similar to last year.

*Haliotis fulgens* sightings continue to be rare and none were observed at the regular kelp forest monitoring sites this year. However, two adult *H. fulgens* were observed at Eel Point San Clemente Island.

No *Haliotis sorenseni* were observed this year. *Haliotis assimilis* were noticeably less abundant in the ARMs this year with only two observed this year, six less than in 2003.

Tunicate cover declined in 2004. Cover of tunicates decreased at eleven sites and remained the same at five sites. *Pycnoclavella stanleyi* were noticeably less abundant this year. *Styela montereyensis* densities increased at three, decreased at two, and remained about the same at the six sites where they are most common.

There were several notable changes in fish populations at the monitoring sites since last year. Most of the comments below and in the site descriptions section under results are garnered from the roving diver fish counts. One of the most notable changes were the increase in kelp surfperch, *Brachyistius frenatus*, observed at the sites with *Macrocystis pyrifera* canopy. These have been noticeably rare in recent past years when canopy cover at most of the sites has been low. Juvenile *Sebastes* spp. were relatively uncommon and noticeably less abundant than the past several years. Juvenile *Sebastes mystinus* were noticeably less abundant than the past several years and were observed at six sites, compared to 12 sites in 2003. *Sebastes serranoides/flavidus* juveniles were observed at seven sites this year, noticeably fewer than the past two years. Juvenile vermilion rockfish, *Sebastes miniatus* were rare this year and observed at Yellow Banks during the roving diver fish counts, similar to the past four years. However several YOY *S. miniatus* were observed at Frenchy's Cove, Anacapa Islands on January 21<sup>st</sup>, 2004. Juvenile *Sebastes atrovirens* were common and observed at nine sites during the roving diver fish count, down from 12 sites in 2003. Juvenile bocaccio, *Sebastes paucispinis* were relatively common and observed at five sites, similar to last year. Juvenile *Sebastes serriceps* were common, but noticeably less abundant than last year. They were observed at 10 sites compared to 15 in 2003. Juvenile *Chromis punctipinnis* were more abundant this year especially at the southern/eastern Island, and were observed at eight sites compared to three in 2003. No juvenile *Hypsypops rubicundus* were observed at the monitoring sites this year. However, one was observed near Admiral's Reef during a training dive on December 2<sup>nd</sup>, 2004. Juvenile *Paralabrax clathratus* were relatively abundant towards the end of the summer and we observed them at five sites during the roving diver fish counts. However, much of our sampling was completed by the time this recruitment event occurred. This recruitment event was well documented by other monitoring groups in the Southern California Bight. Juvenile *Semicossyphus pulcher* were relatively common, more abundant than last year and observed at seven sites. Juvenile *Oxyjulis californica* were noticeably more abundant and widespread than the past several years. They were observed at 11 sites during roving diver fish counts, the highest number since at least 1999. Juvenile *Halichoeres semicinctus* were observed at Pelican Bay and Landing cove during this year, and near Admiral's Reef in December. This is the first time we have observed juveniles during the roving diver fish count since we began using this protocol in 1996. Juvenile halfmoons, *Medialuna californiensis*, were observed off Yellow Banks, Santa Cruz Island this year. Ling Cod, *Ophiodon elongatus* were observed at six sites, similar to the past three years. Cabezon, *Scorpaenichthys marmoratus*, were relatively common and observed at eight sites, similar to the past four years. Giant black sea bass, *Stereolepis gigas* were observed at three sites this year.

This was the first year (2004) we collected Counts (numbers of fish) during all of the Roving Diver Fish Counts. We added the Counts data field in the middle of the 2003 field season because it only takes a little extra effort

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underwater to keep track of whole fish counts and we were losing this information by transferring those numbers to the Abundance codes (S (single) F (few) C (common) and M (many)). If an observer did not feel comfortable or we did not consider them an expert, then only the abundance codes were used. In the case an observer was comfortable counting most fish except cryptic species like *Coryphopterus nicholsii*, then the observer uses Abundance codes for those species and for all others both Abundance codes and Counts. Where fish Counts were not present nor taken (null) an associated null value (blank) is in the data base. 2004 was the first year that all three parameters at all sites were collected during the Roving Diver Fish Count protocol.

In the sites descriptions above we continued to use the Counts as we started to in 2003 to describe the abundance of fish as we believe they are better and more consistent at describing fish abundance than descriptive words like abundant, common or rare. However, different observers count different numbers of the same species at a site for a number of reasons. Though it is possible for an observer to count a fish more than once during a 30 minute fish count, we have chosen to describe fish mostly using the highest number observed at a site. Over time, we think this additional Counts data field will prove to be the most useful in evaluating fish abundance at our sites. In the near future we hope to add a size component to this methodology and train our core staff divers to collect size information as this is important in evaluated the status of the monitoring sites.

Overall, densities of *Coryphopterus nicholsii* decreased ending two years of increasing abundance. We observed decreases at nine sites, no increases, and little or no change at the remaining seven sites. *Lythrypnus dalli* continued to be rare at all 16 monitoring sites and are at their lowest densities since monitoring began for this species in 1985. Fry's Harbor and Pelican Bay at Santa Cruz Island are two sites which typically have the highest abundance of *L. dalli*, and at both these sites densities were 0.0/m<sup>2</sup> though several individuals were observed at both these sites. Overall, *Alloclinus holderi* declined from 2003. *Alloclinus holderi* densities decreased at four sites and with little or no change at the remaining 12 sites. Both *L. dalli* and *A. holderi* are warm water species that increase in abundance during years of anomalously warm water such as during El Niño events.

#### **Unusual Species / Non-Indicator Species:**

One white shark, *Carcharodon carcharias* was observed by David Kushner at the Miracle Mile site at San Miguel Island. He estimated the shark to be at least 2.75 meters, but emphasizes that this is a rough estimate. The shark was swimming inshore of the transect line at the edge of the kelp bed/rocky reef. This is the first *C. carcharias* that has been observed on the kelp forest monitoring program since its inception in 1982.

No sheep crab, *Loxorhynchus grandis*, were observed at Santa Barbara Island sites this year. This species was common in 2003 and abundant in 2002. *Cancer spp.* (mostly *C. antenarius*) were noticeably abundant and wide spread this year. Most were small, indicative of a widespread successful recruitment event.

The northern bryozoan, *Heteropora pacifica*, was notably common at several sites this year. These sites were Wyckoff Ledge and Hare Rock at San Miguel Island, Rodes Reef at Santa Rosa Island, and Gull Island South at Santa Cruz Island. This species has been rare at all of these sites during at least the past 15 years.

We observed many large schools of Sardines, *Sardinops sagax*, as well as schools of Pacific mackerel, *Scomber japonicus* throughout the summer this year. Several small pacific bonito, *Sarda chillensis*, were observed at Yellow Banks, Santa Cruz Island. This species has been notably rare in the Santa Barbara Channel over at least the past decade.

#### **Artificial Recruitment Modules (ARMs):**

ARMs were present and monitored at 10 of the original kelp forest monitoring sites in 2004. In addition, the ARMs placed at Miracle Mile at San Miguel Island were monitored. The below trends refer to the ten original KFM sites.

*Haliotis spp.* in the ARMs were discussed previously in this discussion where we talk about this genus. Overall, *Cypraea spadicea* abundance increased in the ARMs this year, with increases at five sites, decreases at two and no or little change at three sites. *Lithopoma undosum* densities in the ARMs at the sites where they have been common in the past (eastern Santa Cruz Island and Anacapa Island sites) continue to remain low. Similar to last year, there were no noticeable trends in *Megathura crenulata* density in the ARMs, however most are small

indicating some recruitment. *Crassedoma giganteum* densities in the ARMs increased; with increases at seven sites and little or no change at three sites.

*Asterina miniata* densities increased at five sites, decreased at one site and had little or no change at four sites. *Pisaster giganteus* densities increased at four sites, decreased at two sites and had little or no change at four sites. Overall, there was little change in *Pycnopodia helianthoides* abundance in the ARMs this year. *Strongylocentrotus franciscanus* density in the ARMs increased at more sites this year. Their densities increased at five sites, decreased at three sites and had little or no change at two sites. Overall densities of *Strongylocentrotus purpuratus* in the ARMs remained similar to last year. Their density increased at four sites, decreased at four sites and had little or no change at two sites. *Centrostephanus coronatus* remained in low abundance in the ARMs this year with no overall change from 2003.

#### **New Projects:**

In December, 2004 the California Department of Fish and Game, Channel Islands National Park, Channel Islands National Marine Sanctuary, and Channel Islands Marine Resource Institute conducted *Haliotis sorenseni* surveys and deployed BARTs (Baby Abalone Recruitment Traps). BARTs are similar to ARMs, but the cinder blocks are cut into quarters instead of halves and they are placed in a cage of different size and arranged randomly, unlike the ARMs. This project was funded by California Sea Grant, NOAA, and the National Fish and Wildlife Foundation. Two vessels were utilized for this project, the NOAA vessel, RV Shearwater was used to conduct ROV (remote operated vehicle) surveys and the CDFG vessel, RV Garibaldi was used to conduct diver surveys. Most of the surveys were conducted at depths ranging from 15-50 meters. Most of the dives were conducted off the southeastern portion of Santa Cruz Island. Abalones were rare with only five live *Haliotis spp.* observed during the five days of surveys. Four of the five abalones were *H. sorenseni* and the other was a *Haliotis assimilis*. Three of the four *H. sorenseni* were collected for brood stock. Two of the four *H. sorenseni* were large (over 150mm) and the other two measured 105mm and 114mm. This is about the size we would expect an abalone to be at about an age of five years old. This coincides with the *H. sorenseni* recruitment event we observed at the kelp forest monitoring site Yellowbanks in 2000/2001. This site is about one mile from where these two abalones were collected and suggests that the small recruitment event we observed at Yellowbanks was more widespread than just that location. No live *H. rufescens* or *H. corrugata* were observed even though much of the habitat that was surveyed was good habitat for these species and old shells or pieces of shells were relatively common.

#### **Temperature:**

In 2004 two Tidbit loggers were deployed at each site. In previous years, a combination of StowAway™ and Tidbit temperature loggers were deployed, and the data were cross-referenced. In past years we have experienced failures with the StowAway loggers, while the Tidbit™ loggers have proven to be more reliable.

There was an anomalous warm water event during the middle two weeks of September this year. We will mention this in the 2005 annual report when the data is available from the remote temperature loggers at the monitoring sites.

#### **Protocol Changes:**

There were no protocol changes in 2004.

#### **Corrections in the Database:**

In 1988, at sites Johnson's Lee North and Johnson's Lee South at Santa Rosa Island, *Pachythyone rubra* and *Cucumaria sp.* data were collected with random point contact sampling. The data points were combined into a single *Pachythyone rubra/Cucumaria sp.* category on the data sheets and entered into the database as *P. rubra*. This gave *P. rubra* a greater density in the database than was actually present at the two sites. The database has been corrected for this problem. As it is impossible to separate the *Pachythyone rubra/Cucumaria sp.* data into two separate categories, the data points for these spp. have been combined into the miscellaneous invertebrates category. Since *P. rubra* data were not collected at any of the other sites in 1988, with the exception of Fry's Harbor and Hare Rock, any *P. rubra* would have been counted as miscellaneous invertebrates for all the other sites as well. Before the correction, Johnson's Lee North and South had mean densities of miscellaneous invertebrates of 14.1/m<sup>2</sup> and 11.3/m<sup>2</sup> respectively. With the correction, the mean densities for North and South are 22.7/m<sup>2</sup> and 21.4/m<sup>2</sup> respectively.

In 1986, at Santa Rosa's Johnson's Lee North, data were collected for *Cucumaria spp.* These data, which are usually combined with the miscellaneous invertebrates data, were not entered into the database. Thus, the density of miscellaneous invertebrates were actually greater than was reported. The database has been corrected for this by adding the data points from the *Cucumaria spp.* category into the miscellaneous invertebrates category. Before the correction, the mean density of miscellaneous invertebrates at Johnson's Lee North in 1986 was 12.0/m<sup>2</sup>. With the correction, the mean density is 14.8/m<sup>2</sup>.

**Sampling Difficulties:**

All proposed data collection was completed this year.

**Identification Issues:**

We have realized that there are several instances in 1987 and 1988 where *Telia lofotensis* was observed on band transects at Santa Barbara Island. While we do observe this species on occasion at this Island, they are usually rare. There is a possibility that in 1987 and 1988 the *T. lofotensis* observed at the Santa Barbara Island sites were miss-identifications.

**Data Requests:**

In 2004 we filled 14 requests for data from the Park's kelp forest monitoring program. These requests were as follows:

John Ugoretz with the California Department of Fish and Game was sent all of the invertebrate density summaries. Dr. Allan Stewart-Oaten at the University of California at Santa Barbara was sent the 2004 for his long-term statistical work. The fish transect and roving diver fish count data were sent to Jason Cope at the University of Washington who is planning to use the data in stock assessment models as part of his dissertation. Adina Adeles at the Donald Bren School of Environmental Science and Management at the University of California, Santa Barbara was sent all of the KFM summary data. She is planning to post all or some of the data on a web site. Laura Rodgers-Bennett at the California Department of Fish and Game was sent all of the *Haliotis spp.* data from the ARMs (Artificial Recruitment Modules). The KFM technique videos were sent to Meg Jones/Susan Frisch at Orange County Marine Institute for education exhibits. Joshua McGee at Rockwell Scientific requested long term KFM data to use as a tool to explore an experimental method of data visualization for which population data seems an excellent candidate. The temperature data were sent to Tom McCormick at the Channel Islands Research Institute. Tom will be using the data for *Haliotis sorenseni* site location for the deployment of BARTs (Baby Abalone Recruitment Traps). The KFM food menus were sent to the California Department of Fish and Game staff. The fish data were sent to Dr. Ralph Larson at San Francisco State University and Dr. Jenn Caselle at the University of California at Santa Barbara. All of the KFM data on *Semicossyphus pulcher* was sent to Deb Wilson and Cyndi Dawson at the California Department of Fish and Game for fishery assessment.

The KFM summary data were sent to Natalie Senyk who is working on a "Mapping an Ocean Sanctuary" curriculum developed through a partnership of the Center for Image Processing in Education (CIPE), the Sustainable Seas Expedition and Channel Islands National Marine Sanctuary and geared toward secondary school students. The work is funded by NSF and the curriculum objective is to use GIS as a tool to educate students about fundamental marine science principals, using the Channel Islands as a case study through several lessons. See <http://www.evisual.org/homepage.html> for more information on "Mapping an Ocean Sanctuary". The Data will be used in lessons dealing with the distribution of marine resources as a function of ocean currents and the development of marine reserves and their impact on marine species. This project is part of a partnership between CIPE, CINMS and local educators who are interested in incorporating GIS and ocean science curricula into their classrooms. See <http://www.exploreoceans.org> for more information.

Philip Price, a graduate student in the Department of Geography at the University of Leicester was sent all of the abundance raw and summary data in addition to the natural habitat and temperature data. He is using the KFM data (and PISCO data) for a GIS based thesis. The overall objective is to construct a model concerning the area of the Channel Islands National Park and integrating relevant environmental and biological information to establish the relationship between these variables and finally the location of the marine reserves.

The band transect, quadrat, 5-meter quadrat summaries, raw fish data and the species list surveys were sent to Jarrett Byrnes at Bodega Marine Laboratory. He is working on the effect of predator diversity on kelp bed community structure. He may incorporate this data into his dissertation.

All of the temperature data were sent to Dr. Kelly T. Redmond and Greg McCurdy to be posted on the [www.wrcc.dri.edu](http://www.wrcc.dri.edu) website with the other National Park temperature data.

**Publications:**

The following publications using KFM data were published in 2004:

- Lafferty, K.D. 2004. Fishing for Lobsters Indirectly Increases Epidemics in Sea Urchins. *Ecological Applications*. 14(5), 2004, pp. 1566-1573.
- Lafferty, K.D., M.D. Behrens, G.E. Davis, P.L. Haaker, D.J. Kushner, D.V. Richards, I.K. Taniguchi, M.J. Tegner. 2004. Habitat of endangered white abalone, *Haliotis sorenseni*. *Biological Conservation*. 116, pp. 191-194.
- Rogers-Bennett, L., B.L. Allen, G.E. Davis. 2004. Measuring Abalone (*Haliotis Spp.*) Recruitment in California to Examine Recruitment Overfishing and Recovery Criteria. *Journal of Shellfish Research*, Vol 23, No. 4, pp. 1201-1207.

**Information Requests:**

The kelp forest monitoring handbooks and annual reports are available in PDF format on the web at: <http://www.nps.gov/chis/rm/Index.htm>

To obtain raw data collected by the Kelp Forest Monitoring Program, please write to the address below:

Superintendent  
Channel Islands National Park  
1901 Spinnaker Drive  
Ventura, CA 93001

## ACKNOWLEDGEMENTS

This ecological monitoring program was supported by the U.S. National Park Service in cooperation with the California Department of Fish and Game and the U.S. Department of Commerce, National Oceanographic and Atmospheric Administration, Marine Sanctuary Program. The monitoring at San Clemente Island Naval Auxiliary Landing Field was conducted under a contract with the U.S. Navy, Southwest Division Naval Facilities Engineering Command.

We are deeply indebted to the many divers who have participated in this project in 2004 (Table 5). All of our volunteer divers are trained and/or certified with other agencies such as NOAA, California Dept. of Fish and Game, Aquariums and Universities. Without this volunteer base of well-trained and qualified divers it would be impossible to conduct this program at its current funding level. We also greatly appreciate the efforts of our Captain John Provo, Biological Technician Dawn Bailey and Diving Safety Officer Dave Stoltz for supporting us on the boats, keeping us afloat and underwater. We would like to acknowledge Mitch Perdue, Soil Conservationist, Southwest Division, Naval Facilities Engineering Command and Les Stone, Range Manager, for facilitating and coordinating our efforts at San Clemente Island. Gordon Bailey drew the cover illustration.

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**Table 1:** Regularly monitored species by taxonomic grouping, common name, scientific name and associated monitoring technique.

<b>TAXA/COMMON NAME</b>	<b>SCIENTIFIC NAME</b>	<b>TECHNIQUE</b>
<b>ALGAE</b>		
Miscellaneous green algae		R
Miscellaneous red algae		R
Articulated coralline algae		R
Encrusting coralline algae		R
Agar weed	<i>Gelidium spp.</i>	R
Sea tongue	<i>Gigartina spp.</i>	R
Miscellaneous brown algae		R
Acid weed	<i>Desmarestia spp.</i>	R
Oar weed	<i>Laminaria farlowii</i>	R,Q
Bladder chain kelp	<i>Cystoseira spp.</i>	R
Giant kelp	<i>Macrocystis pyrifera</i>	R,Q,M
California sea palm	<i>Pterygophora californica</i>	R,Q
Southern sea palm	<i>Eisenia arborea</i>	R,Q
Miscellaneous plants		R
<b>INVERTEBRATES</b>		
Miscellaneous sponges		R
Orange puffball sponge	<i>Tethya aurantia</i>	B,S
Southern staghorn bryozoan	<i>Diaperoecia californica</i>	R
Miscellaneous bryozoans		R
California hydrocoral	<i>Stylaster californica</i>	B,S
White-spotted rose anemone	<i>Tealia lofotensis</i>	B
Red gorgonian	<i>Lophogorgia chilensis</i>	B,S
Brown gorgonian	<i>Muricea fruticosa</i>	B,S
Californian golden gorgonian	<i>Muricea californica</i>	B,S
Strawberry anemone	<i>Corynactis californica</i>	R
Orange cup coral	<i>Balanophyllia elegans</i>	R
Cup coral	<i>Astrangia lajollaensis</i>	R
Ornate tube worm	<i>Diopatra ornata</i>	R
Colonial sand-tube worm	<i>Phragmatopoma californica</i>	R
Scaled-tube snail	<i>Serpulorbis squamigerus</i>	R
Chestnut cowrie	<i>Cypraea spadicea</i>	Q
Wavy turban snail	<i>Lithopoma undosum</i>	Q,S
Red turban snail	<i>Lithopoma undosum</i>	Q,S
Bat star	<i>Asterina miniata</i>	Q,S
Giant-spined sea star	<i>Pisaster giganteus</i>	Q,S,M
Sunflower star	<i>Pycnopodia helianthoides</i>	B,S
White sea urchin	<i>Lytechinus anamesus</i>	B,S
Red sea urchin	<i>Strongylocentrotus franciscanus</i>	Q,S
Purple sea urchin	<i>Strongylocentrotus purpuratus</i>	Q,S
Warty sea cucumber	<i>Parastichopus parvimensis</i>	Q
Aggregated red sea cucumber	<i>Pachythyone rubra</i>	R
Red abalone	<i>Haliotis rufescens</i>	B,S
Pink abalone	<i>Haliotis corrugata</i>	B,S

Table 1. Continued.

TAXA/COMMON NAME	SCIENTIFIC NAME	TECHNIQUE
<b>INVERTEBRATES Continued:</b>		
Green abalone	<i>Haliotis fulgens</i>	B,S
Kellett's whelk	<i>Kelletia kelletii</i>	B,S
Giant keyhole limpet	<i>Megathura crenulata</i>	B,S
California brown sea hare	<i>Aplysia californica</i>	B
Rock scallop	<i>Crassedoma giganteum</i>	B,S
California spiny lobster	<i>Panulirus interruptus</i>	B
Tunicates		R
Stalked tunicate	<i>Styela montereyensis</i>	Q
Miscellaneous invertebrates		R
<b>FISH</b>		
Bluebanded goby	<i>Lythrypnus dalli</i>	Q
Blackeye goby	<i>Coryphopterus nicholsii</i>	Q
Island kelpfish	<i>Alloclinus holderi</i>	Q
Blacksmith	<i>Chromis punctipinnis</i>	V
Señorita	<i>Oxyjulis californica</i>	V
Blue rockfish	<i>Sebastes mystinus</i>	V
Olive rockfish	<i>Sebastes serranoides</i>	V
Kelp rockfish	<i>Sebastes atrovirens</i>	V
Kelp bass	<i>Paralabrax clathratus</i>	V
California Sheephead	<i>Semicossyphus pulcher</i>	V
Black surfperch	<i>Embiotoca jacksoni</i>	V
Striped surfperch	<i>Embiotoca lateralis</i>	V
Pile perch	<i>Damalichthys vacca</i>	V
Garibaldi	<i>Hypsypops rubicundus</i>	V
Opaleye	<i>Girella nigricans</i>	V
Rock Wrasse	<i>Halichoeres semicinctus</i>	V
<b>SUBSTRATE:</b>		
Bare substrate		R
Substrate types: Rock		R
Cobble		R
Sand		R
<b>Technique Codes:</b>		
B= Band Transect	M= 5m <sup>2</sup> -Quadrat	
Q= Quadrat	S= Size frequency Measurement	
R= Random Point Contact	V= Visual Transect	
<b>CHANGES IN SCIENTIFIC NOMENCLATURE:</b>		
<i>Patiria miniata</i>	=	<i>Asterina miniata</i>
<i>Astraea undosum</i>	=	<i>Lithopoma undosum</i>
<i>Astraea gibberosa</i>	=	<i>Lithopoma gibberosum</i>
<i>Hinnites giganteum</i>	=	<i>Crassedoma giganteum</i>
<i>Allopora californica</i>	=	<i>Stylaster californica</i>
<i>Telia lofotensis</i>	=	<i>Urticina lofotensis</i>

**Table 2:** Station Information.

<b>ISLAND</b>	<b>LOCATION</b>	<b>ABBREVIATION</b>	<b>DEPTH METERS</b>	<b>YEAR ESTABLISHED</b>
San Miguel	Wyckoff Ledge	SMWL	13-15	1981
San Miguel	Hare Rock	SMHR	6-9	1981
San Miguel	Miracle Mile	SMMM		2001
Santa Rosa	Johnson's Lee North	SRJLNO	9-11	1981
Santa Rosa	Johnson's Lee South	SRJLSO	14-16	1981
Santa Rosa	Rodes Reef	SRRR	13-15	1983
Santa Cruz	Gull Island South	SCGI	14-16	1981
Santa Cruz	Fry's Harbor	SCFH	12-13	1981
Santa Cruz	Pelican Bay	SCPB	6-8	1981
Santa Cruz	Scorpion Anchorage	SCSA	5-6	1981
Santa Cruz	Yellowbanks	SCYB	14-15	1986
Anacapa	Admiral's Reef	ANAR	13-15	1981
Anacapa	Cathedral Cove	ANCC	6-11	1981
Anacapa	Landing Cove	ANLC	5-12	1981
Santa Barbara	Southeast Sea Lion Rookery	SBSESL	12-14	1981
Santa Barbara	Arch Point	SBAR	7-8	1981
Santa Barbara	Cat Canyon	SBCAT	7-9	1986
San Clemente	Northwest Harbor	CLNWH	9-12	2003
San Clemente	Boy Scout Camp	CLBSC	12-13	2003
San Clemente	Eel Point	CLEP	10-14	2003
San Clemente	Horse Beach Cove	CLHBC	12-13	2003

**Table 3:** Summary of sampling techniques used to monitor population dynamics of selected kelp forest taxa.

<b>TECHNIQUE</b>	<b>SAMPLE NUMBER OF SIZE REPLICATES</b>
Quadrat count	1 m X 1 m 24X / site
Band Transect count	3 m X 10 m 24X / site
5m <sup>2</sup> -Quadrat	1 m X 5m 40X/ site
Random Point Contact	40 points 15X / site (0.5 x 3 m)
Visual Fish transects	2 m(w) X 3 m(h) X 50 m(l) 8X / sites
Video transects	5 minutes / 100 m; 2X / site, and also a 360° pan at 0, 50 and 100m along transect.
Size frequency measurements	30 to 200 / species: 1X / site (see size frequency measurement dimensions below)
Species Checklist	30 - 90 minutes, 1X / site
Artificial Recruitment Modules	7 - 15 modules / site

**Size Frequency measurement dimensions:**

<b>Genus</b>	<b>Sample Size</b>	<b>Measurement</b>
<i>Macrocystis</i>	100	Stipe count (1 m above bottom), maximum holdfast diameter, mm
<i>Tethya</i>	60	Max. diameter, mm
<i>Stylaster (Allopora)</i>	60	Max. height and width, mm
<i>Lophogorgia</i>	60	Max. height and width, mm
<i>Muricea</i>	60	Max. height and width, mm
<i>Megathura</i>	60	Max. shell length, mm
<i>Haliotis</i>	60	Max. shell length, mm
<i>Lithopoma (Astraea)</i>	60	Max. shell diameter, mm
<i>Kelletia</i>	60	Max. shell length, mm
<i>Crassedoma (Hinnites)</i>	60	Max. shell length, mm
<i>Strongylocentrotus</i>	200	Max. shell diameter, mm
<i>Lytechinus</i>	200	Max. shell diameter, mm
<i>Pycnopodia</i>	60	Length of longest ray, mm
<i>Asterina (Patiria)</i>	60	Length of longest ray, mm
<i>Pisaster</i>	60	Length of longest ray, mm

**Table 4:** 2004 Kelp forest monitoring site status, with 2003 status for comparison.

<b>ISLAND/SITE</b>	<b>2004 STATUS</b>	<b>2003 STATUS</b>
<b><u>San Miguel Island:</u></b>		
Wyckoff Ledge	Mature kelp forest	Mature kelp forest
Hare Rock	Mature kelp forest	Mature kelp forest
Miracle Mile	Mature kelp forest	Mature kelp forest
<b><u>Santa Rosa Island:</u></b>		
Johnson's Lee North	Mature kelp forest	Mature kelp forest
Johnson's Lee South	Mature kelp forest	Mature kelp forest
Rodes Reef	Mature kelp forest	Developing kelp forest
<b><u>Santa Cruz Island:</u></b>		
Gull Island South	Mature kelp forest.	Mature kelp forest.
Fry's Harbor	In transition, possibly to kelp forest.	Open area with high densities of aggregating red sea cucumbers, <i>Pachythyone rubra</i> , and brittle stars, <i>Ophiothrix spiculata</i>
Pelican Bay	Dominated by <i>Strongylocentrotus purpuratus</i> .	Dominated by <i>Strongylocentrotus purpuratus</i> .
Scorpion Anchorage	Dominated by <i>Strongylocentrotus purpuratus</i> .	Dominated by <i>Strongylocentrotus purpuratus</i> .
Yellowbanks	Kelp forest	Developing kelp forest
<b><u>Anacapa Island:</u></b>		
Admiral's Reef	Dominated by <i>Ophiothrix spiculata</i> and in some areas <i>S. purpuratus</i> .	Dominated by <i>Strongylocentrotus purpuratus</i> and <i>Ophiothrix spiculata</i> .
Cathedral Cove	Kelp forest	Sparse kelp forest with patches dominated by <i>Strongylocentrotus franciscanus</i> .
Landing Cove	Kelp forest	Open developing kelp forest
<b><u>Santa Barbara Island:</u></b>		
Southeast Sea Lion Rookery	Dominated by <i>O. spiculata</i> , <i>S. purpuratus</i> , and <i>S. franciscanus</i>	Developing kelp forest over half the transect, other half dominated by <i>Ophiothrix spiculata</i>
Arch Point	Dominated by <i>S. purpuratus</i> and <i>S. franciscanus</i>	Developing kelp forest
Cat Canyon	Dominated by <i>S. purpuratus</i> and <i>S. franciscanus</i>	Developing kelp forest
<b><u>San Clemente Island:</u></b>		
Northwest Harbor	Mature dense kelp forest	Mature dense kelp forest
Boy Scout Camp	Mature kelp forest with a thick understory	Mature kelp forest with a thick understory
Eel Point	Mature kelp forest with patches of high density subadults	Mature kelp forest with patches of high density subadults
Horse Beach Cove	Mature kelp forest with patches of high density subadults	Mature kelp forest with patches of high density subadults



**Table 5:** 2004 Kelp Forest Monitoring Program participant and cruise list.

<b>PARTICIPANTS</b>	<b>AFFILIATION</b>	<b>CRUISES PARTICIPATED</b>
Aamodt, Kjeld	University of California San Diego	6
Bailey, Dawn	Channel Islands National Park	1,2,3,4,5,6,7,8
Bodensteiner, Laura	MLML VIP	1
Cloonan, Jim	Long Beach Aquarium of the Pacific	4
Conti, John	Volunteer, Channel Islands National Park	2,5
Dawson, Cindy	California Department of Fish and Game	2
Fangman, Sarah	NOAA	4
Garske, Lauren	University of Southern California	8
Guardino, Michael	Monterey Bay Aquarium	3
Haaker, Peter	California Department of Fish and Game	3
Hernaes, Ben	Volunteer, Channel Islands National Park	1,2,3,4,5,6,7,8
Kushner, David	Channel Islands National Park	1,2,3,4,5,6,7,8
Osorio, David	California Department of Fish and Game	5
Provo, John	Channel Islands National Park	1,2,4,5,6,7,8
Rich, Paula	Channel Islands National Park	1,2,3,4,5,6,7,8
Richards, Dan	Channel Islands National Park	1,2
Schroeder, Donna	University of California, Santa Barbara	3
Sprague, Joshua	Channel Islands National Park	2,3,4,5,6,7,8
Taniguchi, Ian	California Department of Fish and Game	4,7
Witting, David	Rutgers University	6
Yonker, Cyd	University of California, Davis	1

<b>CRUISE NUMBER</b>	<b>2004 CRUISE DATES</b>	<b>KELP FOREST MONITORING SITES VISITED</b>
1	June 7-10	ANCC, SBAP, SBSESL
2	June 21-28	CLBSC, CLEP, CLNWH, CLHBC, SBCC
3	July 12-16	SCYB, SCGI, SCPB, SCFH, ANLC
4	July 26-30	SRRR, SMHR, SMWL, SRJLNO, SRJLSO, SCYB
5	August 9-13	ANAR, ANCC, ANLC, SCSA, ANCC
6	August 23-27	SCGI, SRJLSO, SRJLNO, SCFH
7	September 13-17	SBSESL, SBAP, SBCC, ANLC, SCYB, SCSA
8	Sep. 7 – Oct. 1	SRRR, SMMM, SMWL, SMHR, SCGI, SCPB, ANAR

**Table 6.** 2004 Echinoderm wasting disease/syndrome observations.

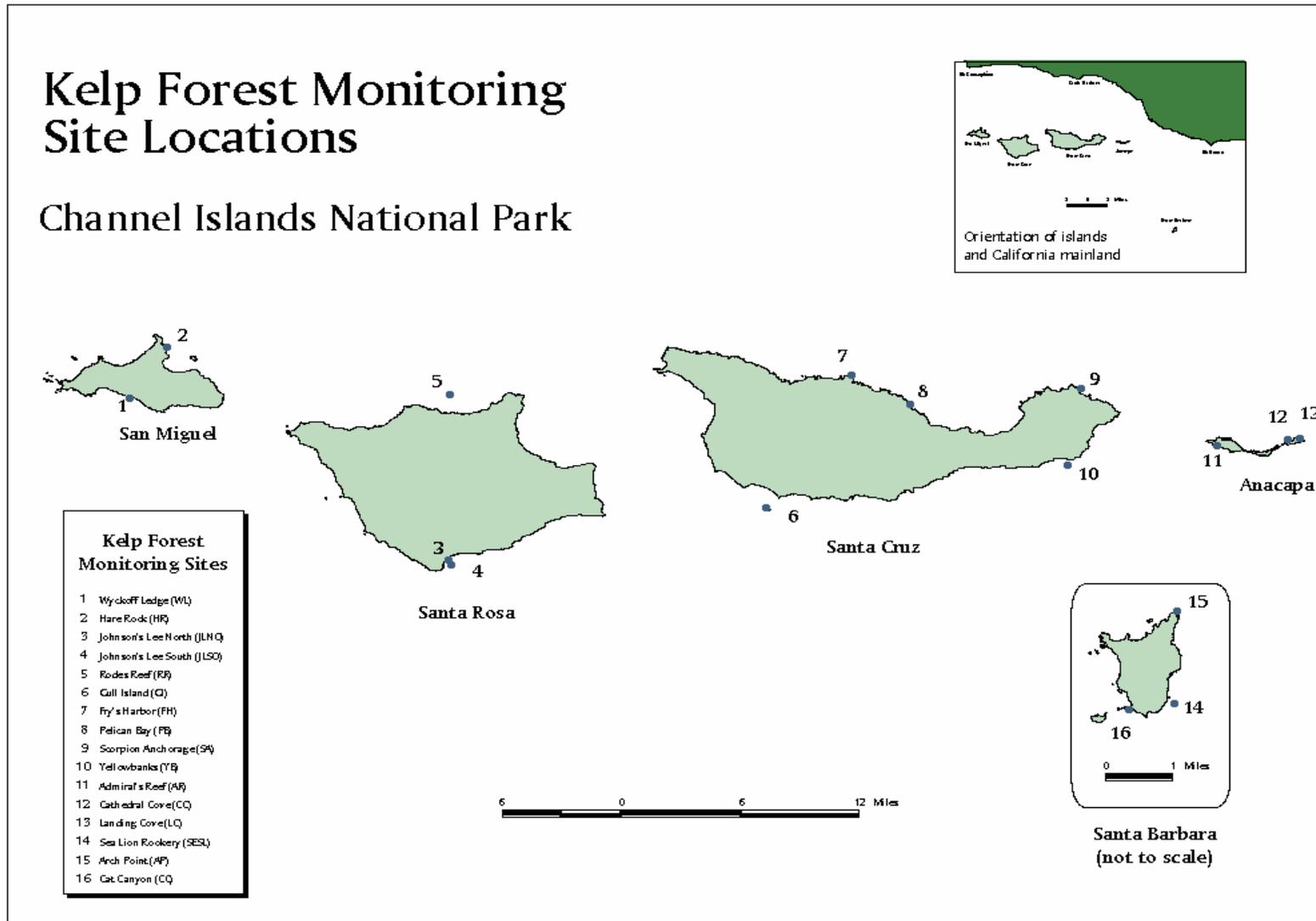
ISLAND/SITE	Sea Star Wasting Syndrome		Sea Urchin Wasting Syndrome	
	SPECIES OBSERVED	DATE(s)	SPECIES OBSERVED	DATE(s)
<b><u>San Miguel Island</u></b>				
Wyckoff Ledge	None		None	
Hare Rock	None		None	
Miracle Mile	None		None	
<b><u>Santa Rosa Island</u></b>				
Johnson's Lee North	None		None	
Johnson's Lee South	None		None	
Rodes Reef	None		None	
<b><u>Santa Cruz Island</u></b>				
Gull Island South	None		None	
Fry's Harbor	11	7/15	None	
Pelican Bay	1,4	7/14, 9/30	2,3	9/30
Scorpion Anchorage	1,4	9/17	2	8/12
Yellowbanks	1	9/16	None	
<b><u>Anacapa Island</u></b>				
Admiral's Reef	1	10/1	2,6	10/1
Cathedral Cove	None		None	
Landing Cove	1,4	9/15	None	
<b><u>Santa Barbara Island</u></b>				
SE Sea Lion Rookery	1	9/13	None	
Arch Point	1,4	9/13	None	
Cat Canyon	1,4	9/13	None	
<b><u>San Clemente Island</u></b>				
Northwest Harbor	None		None	
Boy Scout Camp	None		None	
Eel Point	None		None	
Horse Beach Cove	None		None	

**SPECIES LEGEND:**

- |  |                                      |
|--|--------------------------------------|
| 1 = <i>Asterina (Patiria) miniata</i>      | 7 = <i>Parastichopus parvimensis</i> |
| 2 = <i>Strongylocentrotus purpuratus</i>   | 8 = <i>Dermasterias imbricata</i>    |
| 3 = <i>Lytechinus anamesus</i>             | 9 = <i>Mediaster aequalis</i>        |
| 4 = <i>Pisaster giganteus</i>              | 10 = <i>Pycnopodia helianthoides</i> |
| 5 = <i>Astrometis sertulifera</i>          | 11 = <i>Pisaster ochraceus</i>       |
| 6 = <i>Strongylocentrotus franciscanus</i> |                                      |

none = not observed at this site during our visits in 2004

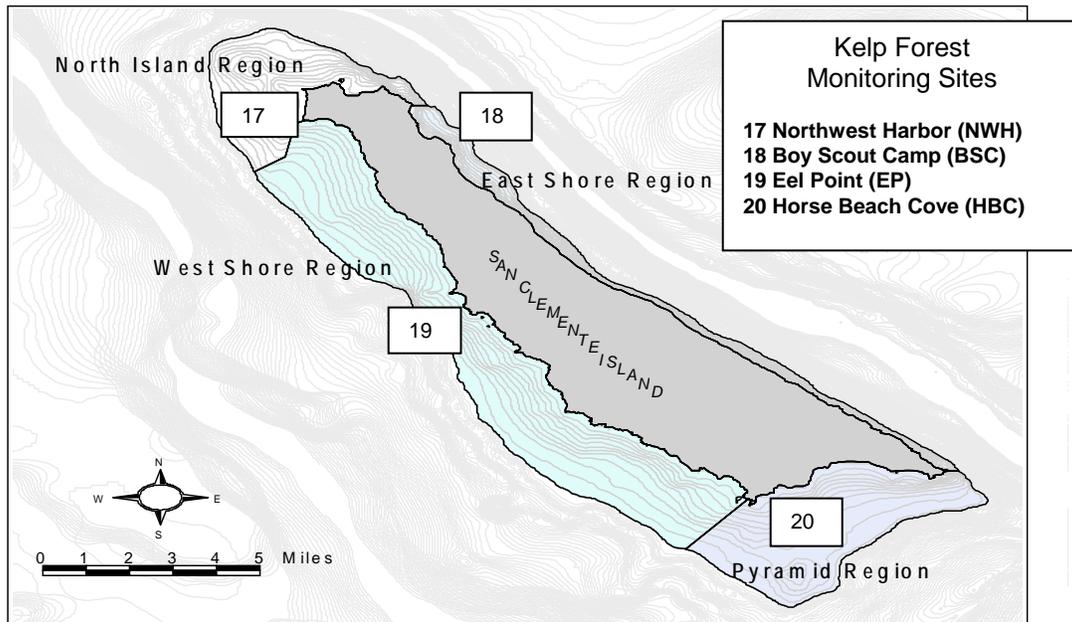
date = date(s) disease/syndrome was observed



**Figure 1:** Kelp Forest Monitoring Locations at Channel Islands National Park.

# Kelp Forest Monitoring Site Locations Naval Auxiliary Landing Field San Clemente Island

**Figure 2:** Kelp Forest Monitoring Locations at San Clemente Island.



<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Miguel Island - Wyckoff Ledge			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.1250	0.3108	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0417	0.1443	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.1667	0.3257	12
<i>Pterygophora californica</i> juvenile	0.0417	0.1443	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Agarum fimbriatum</i> juvenile	1.9167	4.1661	12
<i>Cypraea spadicea</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.3750	0.4330	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.2917	0.6895	12
<i>Asterina miniata</i>	2.0000	1.6376	12
<i>Pisaster giganteus</i>	0.0417	0.1443	12
<i>Strongylocentrotus franciscanus</i>	4.8333	10.7795	12
<i>Strongylocentrotus purpuratus</i>	2.7083	6.6382	12
<i>Parastichopus parvimensis</i>	0.0000	0.0000	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.1250	0.2261	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.0833	0.2887	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Miguel Island - Hare Rock			
<i>Macrocystis pyrifera</i> Ad.(>1m)	1.0833	1.2939	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	1.4583	3.3060	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.3333	0.7177	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	2.0833	1.2029	12
<i>Pisaster giganteus</i>	0.5417	0.6557	12
<i>Strongylocentrotus franciscanus</i>	6.7500	11.5847	12
<i>Strongylocentrotus purpuratus</i>	5.3750	9.4077	12
<i>Parastichopus parvimensis</i>	0.1250	0.3108	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0417	0.1443	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.3333	0.8616	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12
Santa Rosa Island - Johnson's Lee North			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.2500	0.4523	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	4.2083	4.6145	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0417	0.1443	12
<i>Pterygophora californica</i> adult	0.0417	0.1443	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0833	0.1946	12
<i>Laminaria farlowii</i> juvenile	0.0417	0.1443	12
<i>Cypraea spadicea</i>	0.5833	0.5967	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.4583	0.8908	12
<i>Pisaster giganteus</i>	0.1250	0.3108	12
<i>Strongylocentrotus franciscanus</i>	1.3333	3.5697	12
<i>Strongylocentrotus purpuratus</i>	0.7917	2.7424	12
<i>Parastichopus parvimensis</i>	0.3333	0.6155	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	1.6250	1.2271	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.1250	0.2261	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Rosa Island - Johnson's Lee South			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.5833	0.5573	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	3.6667	6.1656	12
<i>Eisenia arborea</i> adult	0.1667	0.4438	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.3333	0.6155	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.2083	0.3343	12
<i>Laminaria farlowii</i> juvenile	0.2500	0.3989	12
<i>Cypraea spadicea</i>	0.0833	0.1946	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.0417	0.1443	12
<i>Asterina miniata</i>	3.1667	2.6912	12
<i>Pisaster giganteus</i>	0.0417	0.1443	12
<i>Strongylocentrotus franciscanus</i>	0.5833	1.7299	12
<i>Strongylocentrotus purpuratus</i>	0.6667	1.6833	12
<i>Parastichopus parvimensis</i>	0.0417	0.1443	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.3750	0.4827	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.4167	0.4687	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12
Santa Rosa Island - Rodes Reef			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.1667	0.3257	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.6667	1.2123	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.0417	0.1443	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.1250	0.3108	12
<i>Asterina miniata</i>	3.0417	1.6020	12
<i>Pisaster giganteus</i>	0.5417	0.6557	12
<i>Strongylocentrotus franciscanus</i>	2.1667	4.2870	12
<i>Strongylocentrotus purpuratus</i>	0.1667	0.4438	12
<i>Parastichopus parvimensis</i>	0.0000	0.0000	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.3750	0.4330	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.0417	0.1443	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Cruz Island - Gull Island South			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.2500	0.5000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	6.2917	4.2504	12
<i>Eisenia arborea</i> adult	0.0417	0.1443	12
<i>Eisenia arborea</i> juvenile	2.0000	1.5521	12
<i>Pterygophora californica</i> adult	0.0417	0.1443	12
<i>Pterygophora californica</i> juvenile	0.6250	0.5276	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.2500	0.2611	12
<i>Cypraea spadicea</i>	0.0417	0.1443	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	2.4583	1.2695	12
<i>Pisaster giganteus</i>	0.3750	0.6077	12
<i>Strongylocentrotus franciscanus</i>	0.1250	0.3108	12
<i>Strongylocentrotus purpuratus</i>	0.0417	0.1443	12
<i>Parastichopus parvimensis</i>	0.2083	0.3343	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0833	0.2887	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.5417	0.5823	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12
Santa Cruz Island - Fry's Harbor			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0000	0.0000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0417	0.1443	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.7917	0.8908	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.8750	0.6784	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	1.6667	1.1547	12
<i>Pisaster giganteus</i>	0.7500	0.8394	12
<i>Strongylocentrotus franciscanus</i>	0.0833	0.1946	12
<i>Strongylocentrotus purpuratus</i>	0.1250	0.4330	12
<i>Parastichopus parvimensis</i>	0.0417	0.1443	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	2.2083	2.7007	12
<i>Alloclinus holderi</i>	0.0833	0.1946	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Cruz Island - Pelican Bay			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0000	0.0000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0000	0.0000	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.0417	0.1443	12
<i>Lithopoma undosum</i>	0.0417	0.1443	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.5833	0.5573	12
<i>Pisaster giganteus</i>	0.0417	0.1443	12
<i>Lytechinus anamesus</i>	5.8333	3.5248	12
<i>Strongylocentrotus franciscanus</i>	1.4167	1.0188	12
<i>Strongylocentrotus purpuratus</i>	22.1250	13.2804	12
<i>Parastichopus parvimensis</i>	0.1667	0.2462	12
<i>Centrostephanus coronatus</i>	0.1250	0.2261	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	4.9583	1.6440	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12
Santa Cruz Island - Scorpion Anchorage			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0000	0.0000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0000	0.0000	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.4167	0.7638	12
<i>Lithopoma undosum</i>	0.0833	0.1946	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.5833	0.8747	12
<i>Pisaster giganteus</i>	0.0417	0.1443	12
<i>Lytechinus anamesus</i>	0.0833	0.2887	12
<i>Strongylocentrotus franciscanus</i>	2.3333	1.5423	12
<i>Strongylocentrotus purpuratus</i>	42.1250	21.4647	12
<i>Parastichopus parvimensis</i>	0.2500	0.2611	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	3.0417	1.6020	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Cruz Island - Yellow Banks			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.8333	0.7487	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0417	0.1443	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.5000	0.5222	12
<i>Pterygophora californica</i> juvenile	0.2917	0.3343	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0417	0.1443	12
<i>Cypraea spadicea</i>	0.0833	0.1946	12
<i>Lithopoma undosum</i>	0.1667	0.4438	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	1.2917	1.1572	12
<i>Pisaster giganteus</i>	0.2083	0.3343	12
<i>Lytechinus anamesus</i>	0.4583	0.4981	12
<i>Strongylocentrotus franciscanus</i>	0.1667	0.4438	12
<i>Strongylocentrotus purpuratus</i>	3.1250	2.6979	12
<i>Parastichopus parvimensis</i>	0.1667	0.3257	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.4167	0.5149	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12
Anacapa Island - Admiral's Reef			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0833	0.2887	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0417	0.1443	12
<i>Eisenia arborea</i> adult	0.1250	0.4330	12
<i>Eisenia arborea</i> juvenile	0.0833	0.1946	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.1250	0.3108	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	1.8750	1.3672	12
<i>Pisaster giganteus</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
<i>Strongylocentrotus franciscanus</i>	3.7500	3.2087	12
<i>Strongylocentrotus purpuratus</i>	6.1667	7.1170	12
<i>Parastichopus parvimensis</i>	0.5000	0.7687	12
<i>Centrostephanus coronatus</i>	0.7500	0.9170	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	1.9167	1.2029	12
<i>Alloclinus holderi</i>	0.0417	0.1443	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Anacapa Island - Cathedral Cove			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.5833	1.0188	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	3.8333	5.1272	12
<i>Eisenia arborea</i> adult	0.0833	0.1946	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0417	0.1443	12
<i>Laminaria farlowii</i> juvenile	0.3333	0.8616	12
<i>Cypraea spadicea</i>	0.2083	0.5823	12
<i>Lithopoma undosum</i>	2.0833	1.7430	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.1250	0.2261	12
<i>Pisaster giganteus</i>	0.1250	0.2261	12
<i>Strongylocentrotus franciscanus</i>	5.0417	3.1799	12
<i>Strongylocentrotus purpuratus</i>	1.0833	1.4434	12
<i>Parastichopus parvimensis</i>	0.9167	0.7638	12
<i>Centrostephanus coronatus</i>	0.1667	0.3892	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.8750	0.4827	12
<i>Alloclinus holderi</i>	0.6250	0.5691	12
Anacapa Island - Landing Cove			
<i>Macrocystis pyrifera</i> Ad.(>1m)	1.6250	1.9786	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	11.8333	13.7862	12
<i>Eisenia arborea</i> adult	1.0000	1.3143	12
<i>Eisenia arborea</i> juvenile	0.5000	0.9293	12
<i>Pterygophora californica</i> adult	0.0417	0.1443	12
<i>Pterygophora californica</i> juvenile	0.0833	0.1946	12
<i>Laminaria farlowii</i> adult	1.9583	2.9113	12
<i>Laminaria farlowii</i> juvenile	21.0000	22.2802	12
<i>Cypraea spadicea</i>	0.0417	0.1443	12
<i>Lithopoma undosum</i>	1.4583	1.4841	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Crassedoma giganteum</i>	0.7083	1.2873	12
<i>Asterina miniata</i>	0.0000	0.0000	12
<i>Pisaster giganteus</i>	0.0000	0.0000	12
<i>Strongylocentrotus franciscanus</i>	2.2917	3.2784	12
<i>Strongylocentrotus purpuratus</i>	2.5833	2.7702	12
<i>Parastichopus parvimensis</i>	0.8750	0.9077	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.4583	1.0104	12
<i>Alloclinus holderi</i>	0.2917	0.3965	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Barbara Island - SE Sea Lion Rookery			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0000	0.0000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0000	0.0000	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.0000	0.0000	12
<i>Lithopoma undosum</i>	0.4583	0.6895	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.4583	0.5418	12
<i>Pisaster giganteus</i>	0.0417	0.1443	12
<i>Strongylocentrotus franciscanus</i>	13.0000	7.8682	12
<i>Strongylocentrotus purpuratus</i>	18.5000	11.2795	12
<i>Parastichopus parvimensis</i>	0.2917	0.3343	12
<i>Centrostephanus coronatus</i>	0.2083	0.3343	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.1250	0.3108	12
<i>Alloclinus holderi</i>	0.1250	0.2261	12
Santa Barbara Island - Arch Point			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0000	0.0000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0000	0.0000	12
<i>Eisenia arborea</i> adult	0.1250	0.4330	12
<i>Eisenia arborea</i> juvenile	0.0833	0.1946	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0833	0.2887	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.0417	0.1443	12
<i>Lithopoma undosum</i>	1.3333	2.3094	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	2.1250	2.3561	12
<i>Pisaster giganteus</i>	0.3333	0.4924	12
<i>Strongylocentrotus franciscanus</i>	33.0417	16.6139	12
<i>Strongylocentrotus purpuratus</i>	46.0833	24.9580	12
<i>Parastichopus parvimensis</i>	0.1250	0.2261	12
<i>Centrostephanus coronatus</i>	0.2083	0.4502	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.0417	0.1443	12
<i>Alloclinus holderi</i>	0.3750	0.4827	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Barbara Island - Cat Canyon			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.0000	0.0000	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0000	0.0000	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.0833	0.1946	12
<i>Lithopoma undosum</i>	0.4583	0.7217	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.3333	0.5365	12
<i>Pisaster giganteus</i>	0.2083	0.3343	12
<i>Strongylocentrotus franciscanus</i>	19.1250	7.1259	12
<i>Strongylocentrotus purpuratus</i>	42.5833	15.9072	12
<i>Parastichopus parvimensis</i>	0.7083	0.4981	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.0417	0.1443	12
<i>Alloclinus holderi</i>	0.7917	0.8107	12
San Clemente Island - Northwest Harbor			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.5833	1.2216	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	17.7917	23.3690	12
<i>Eisenia arborea</i> adult	0.5833	1.7167	12
<i>Eisenia arborea</i> juvenile	0.0417	0.1443	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.1250	0.3108	12
<i>Laminaria farlowii</i> juvenile	0.0833	0.1946	12
<i>Cypraea spadicea</i>	0.0000	0.0000	12
<i>Lithopoma undosum</i>	0.0833	0.1946	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.0000	0.0000	12
<i>Pisaster giganteus</i>	0.1250	0.2261	12
<i>Strongylocentrotus franciscanus</i>	1.8750	1.6254	12
<i>Strongylocentrotus purpuratus</i>	2.0417	1.5442	12
<i>Parastichopus parvimensis</i>	0.2083	0.2575	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.1250	0.2261	12
<i>Alloclinus holderi</i>	0.2083	0.2575	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Clemente Island - Boy Scout Camp			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.7500	0.8394	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.4583	0.6557	12
<i>Eisenia arborea</i> adult	0.3750	0.7724	12
<i>Eisenia arborea</i> juvenile	0.3333	0.4924	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.4583	0.6201	12
<i>Laminaria farlowii</i> juvenile	0.6250	0.9799	12
<i>Agarum fimbriatum</i> adult	0.4583	0.4981	12
<i>Agarum fimbriatum</i> juvenile	0.1667	0.4438	12
<i>Cypraea spadicea</i>	0.0000	0.0000	12
<i>Lithopoma undosum</i>	0.1250	0.2261	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.0000	0.0000	12
<i>Pisaster giganteus</i>	0.0000	0.0000	12
<i>Strongylocentrotus franciscanus</i>	0.8333	0.8072	12
<i>Strongylocentrotus purpuratus</i>	0.0000	0.0000	12
<i>Parastichopus parvimensis</i>	0.3333	0.3257	12
<i>Centrostephanus coronatus</i>	0.1667	0.4438	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.7917	1.0967	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12
San Clemente Island - Eel Point			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.2917	0.3965	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	26.8750	25.4872	12
<i>Eisenia arborea</i> adult	0.0000	0.0000	12
<i>Eisenia arborea</i> juvenile	0.0417	0.1443	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0417	0.1443	12
<i>Laminaria farlowii</i> juvenile	1.7500	2.0505	12
<i>Cypraea spadicea</i>	0.0000	0.0000	12
<i>Lithopoma undosum</i>	0.0833	0.1946	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.0000	0.0000	12
<i>Pisaster giganteus</i>	0.0833	0.1946	12
<i>Strongylocentrotus franciscanus</i>	0.6250	0.7424	12
<i>Strongylocentrotus purpuratus</i>	1.7083	1.5145	12
<i>Parastichopus parvimensis</i>	0.4583	0.4502	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.0000	0.0000	12
<i>Alloclinus holderi</i>	0.1250	0.2261	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Clemente Island - Horse Beach Cove			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.5000	0.4264	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	5.6667	7.7850	12
<i>Eisenia arborea</i> adult	0.0417	0.1443	12
<i>Eisenia arborea</i> juvenile	0.0000	0.0000	12
<i>Pterygophora californica</i> adult	0.0000	0.0000	12
<i>Pterygophora californica</i> juvenile	0.0000	0.0000	12
<i>Laminaria farlowii</i> adult	0.0833	0.2887	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Cypraea spadicea</i>	0.0000	0.0000	12
<i>Lithopoma undosum</i>	0.0417	0.1443	12
<i>Lithopoma gibberosum</i>	0.0000	0.0000	12
<i>Asterina miniata</i>	0.0000	0.0000	12
<i>Pisaster giganteus</i>	0.0833	0.1946	12
<i>Strongylocentrotus franciscanus</i>	1.6250	1.8479	12
<i>Strongylocentrotus purpuratus</i>	0.5417	0.8649	12
<i>Parastichopus parvimensis</i>	0.2917	0.4502	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.0000	0.0000	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.5833	0.5967	12
<i>Alloclinus holderi</i>	0.0417	0.1443	12
San Miguel Island - Miracle Mile			
<i>Macrocystis pyrifera</i> Ad.(>1m)	0.5000	0.6030	12
<i>Macrocystis pyrifera</i> Juvenile (<1m)	0.0000	0.0000	12
<i>Eisenia arborea</i> adult	1.1667	1.2309	12
<i>Eisenia arborea</i> juvenile	0.3333	0.6853	12
<i>Pterygophora californica</i> adult	1.5833	1.6492	12
<i>Pterygophora californica</i> juvenile	0.2500	0.3371	12
<i>Laminaria farlowii</i> adult	0.0000	0.0000	12
<i>Laminaria farlowii</i> juvenile	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.4167	0.6337	12
<i>Cypraea spadicea</i>	0.0417	0.1443	12
<i>Lithopoma undosum</i>	0.0000	0.0000	12
<i>Lithopoma gibberosum</i>	0.1667	0.3257	12
<i>Asterina miniata</i>	3.4583	2.1475	12
<i>Pisaster giganteus</i>	0.2083	0.3343	12
<i>Strongylocentrotus franciscanus</i>	4.2917	5.2720	12
<i>Strongylocentrotus purpuratus</i>	0.7500	1.4694	12
<i>Parastichopus parvimensis</i>	0.0417	0.1443	12
<i>Centrostephanus coronatus</i>	0.0000	0.0000	12
<i>Styela montereyensis</i>	0.1250	0.2261	12
<i>Lythrypnus dalli</i>	0.0000	0.0000	12
<i>Coryphopterus nicholsii</i>	0.0417	0.1443	12
<i>Alloclinus holderi</i>	0.0000	0.0000	12

2004 5-METER QUADRAT DATA: MEAN NUMBER PER M<sup>2</sup>NOTE: *Macrocystis pyrifera* Adult = >1m and haptera above the primary dichotomy*Macrocystis pyrifera* Subadult = >1m and NO haptera above the primary dichotomy

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Miguel Island - Wyckoff Ledge			
<i>Macrocystis pyrifera</i> Adult	<b>0.2900</b>	<b>0.3388</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0000</b>	<b>0.0000</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.0300</b>	<b>0.0723</b>	<b>40</b>
San Miguel Island - Hare Rock			
<i>Macrocystis pyrifera</i> Adult	<b>0.4550</b>	<b>0.4641</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.7050</b>	<b>0.8277</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.3050</b>	<b>0.5223</b>	<b>40</b>
Santa Rosa Island - Johnson's Lee North			
<i>Macrocystis pyrifera</i> Adult	<b>0.2100</b>	<b>0.2351</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0750</b>	<b>0.1335</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.1850</b>	<b>0.3017</b>	<b>40</b>
Santa Rosa Island - Johnson's Lee South			
<i>Macrocystis pyrifera</i> Adult	<b>0.2200</b>	<b>0.2345</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0800</b>	<b>0.1556</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.0600</b>	<b>0.1582</b>	<b>40</b>
Santa Rosa Island - Rodes Reef			
<i>Macrocystis pyrifera</i> Adult	<b>0.1150</b>	<b>0.1562</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.3300</b>	<b>0.7600</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.3900</b>	<b>0.4618</b>	<b>40</b>
Santa Cruz Island - Gull Island South			
<i>Macrocystis pyrifera</i> Adult	<b>0.1250</b>	<b>0.1736</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.4050</b>	<b>0.6000</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.2850</b>	<b>0.2860</b>	<b>40</b>
Santa Cruz Island - Fry's Harbor			
<i>Macrocystis pyrifera</i> Adult	<b>0.0000</b>	<b>0.0000</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0050</b>	<b>0.0316</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.5400</b>	<b>0.4349</b>	<b>40</b>
Santa Cruz Island - Pelican Bay			
<i>Macrocystis pyrifera</i> Adult	<b>0.0000</b>	<b>0.0000</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0000</b>	<b>0.0000</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.1000</b>	<b>0.1432</b>	<b>40</b>

2004 5-METER QUADRAT DATA: MEAN NUMBER PER M<sup>2</sup>

NOTE: *Macrocystis pyrifera* Adult = >1m and haptera above the primary dichotomy  
*Macrocystis pyrifera* Subadult = >1m and NO haptera above the primary dichotomy

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Cruz Island - Scorpion Anchorage			
<i>Macrocystis pyrifera</i> Adult	0.0000	0.0000	40
<i>Macrocystis pyrifera</i> Subadult	0.0000	0.0000	40
<i>Pisaster giganteus</i>	0.0700	0.1067	40
Santa Cruz Island - Yellow Banks			
<i>Macrocystis pyrifera</i> Adult	0.1600	0.2274	40
<i>Macrocystis pyrifera</i> Subadult	0.5300	0.4310	40
<i>Pisaster giganteus</i>	0.0550	0.1431	40
Anacapa Island - Admiral's Reef			
<i>Macrocystis pyrifera</i> Adult	0.0050	0.0316	40
<i>Macrocystis pyrifera</i> Subadult	0.0250	0.0809	40
<i>Pisaster giganteus</i>	0.0450	0.0959	40
Anacapa Island - Cathedral Cove			
<i>Macrocystis pyrifera</i> Adult	0.0200	0.0608	40
<i>Macrocystis pyrifera</i> Subadult	0.7350	1.1226	40
<i>Pisaster giganteus</i>	0.0150	0.0533	40
Anacapa Island - Landing Cove			
<i>Macrocystis pyrifera</i> Adult	0.1250	0.1958	40
<i>Macrocystis pyrifera</i> Subadult	2.0200	2.0060	40
<i>Pisaster giganteus</i>	0.0050	0.0316	40
Santa Barbara Island - SE Sea Lion Rookery			
<i>Macrocystis pyrifera</i> Adult	0.0000	0.0000	40
<i>Macrocystis pyrifera</i> Subadult	0.0000	0.0000	40
<i>Pisaster giganteus</i>	0.0800	0.1181	40
Santa Barbara Island - Arch Point			
<i>Macrocystis pyrifera</i> Adult	0.0000	0.0000	40
<i>Macrocystis pyrifera</i> Subadult	0.0000	0.0000	40
<i>Pisaster giganteus</i>	0.1800	0.2388	40
Santa Barbara Island - Cat Canyon			
<i>Macrocystis pyrifera</i> Adult	0.0000	0.0000	40
<i>Macrocystis pyrifera</i> Subadult	0.0000	0.0000	40
<i>Pisaster giganteus</i>	0.1150	0.1805	40

2004 5-METER QUADRAT DATA: MEAN NUMBER PER M<sup>2</sup>

NOTE: *Macrocystis pyrifera* Adult = >1m and haptera above the primary dichotomy  
*Macrocystis pyrifera* Subadult = >1m and NO haptera above the primary dichotomy

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Clemente Island - Northwest Harbor			
<i>Macrocystis pyrifera</i> Adult	<b>0.2250</b>	<b>0.2687</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.7150</b>	<b>1.1652</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.0600</b>	<b>0.1215</b>	<b>40</b>
San Clemente Island - Boy Scout Camp			
<i>Macrocystis pyrifera</i> Adult	<b>0.0800</b>	<b>0.1682</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.5600</b>	<b>0.4372</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.0000</b>	<b>0.0000</b>	<b>40</b>
San Clemente Island - Eel Point			
<i>Macrocystis pyrifera</i> Adult	<b>0.2750</b>	<b>0.2550</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0750</b>	<b>0.1335</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.0200</b>	<b>0.0758</b>	<b>40</b>
San Clemente Island - Horse Beach Cove			
<i>Macrocystis pyrifera</i> Adult	<b>0.2400</b>	<b>0.2570</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.0850</b>	<b>0.1424</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.0200</b>	<b>0.0608</b>	<b>40</b>
San Miguel Island - Miracle Mile			
<i>Macrocystis pyrifera</i> Adult	<b>0.1850</b>	<b>0.2045</b>	<b>40</b>
<i>Macrocystis pyrifera</i> Subadult	<b>0.1500</b>	<b>0.1961</b>	<b>40</b>
<i>Pisaster giganteus</i>	<b>0.3750</b>	<b>0.4667</b>	<b>40</b>

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Miguel Island - Wyckoff Ledge			
<i>Tethya aurantia</i>	0.1597	0.0839	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.3722	0.2832	12
<i>Lophogorgia chilensis</i>	0.0014	0.0048	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0542	0.0587	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.1722	0.1282	12
<i>Megathura crenulata</i>	0.0000	0.0000	12
<i>Crassedoma giganteum</i>	0.0097	0.0132	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0194	0.0234	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
San Miguel Island - Hare Rock			
<i>Tethya aurantia</i>	0.0292	0.0363	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0153	0.0219	12
<i>Lophogorgia chilensis</i>	0.0000	0.0000	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0028	0.0065	12
<i>Megathura crenulata</i>	0.0042	0.0075	12
<i>Crassedoma giganteum</i>	0.0028	0.0065	12
<i>Aplysia californica</i>	0.0014	0.0048	12
<i>Pycnopodia helianthoides</i>	0.0708	0.0488	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
Santa Rosa Island - Johnson's Lee North			
<i>Tethya aurantia</i>	0.0931	0.0474	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0181	0.0219	12
<i>Lophogorgia chilensis</i>	0.0042	0.0104	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0069	0.0150	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0014	0.0048	12
<i>Megathura crenulata</i>	0.0056	0.0082	12
<i>Crassedoma giganteum</i>	0.0167	0.0174	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.1056	0.0351	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Rosa Island - Johnson's Lee South			
<i>Tethya aurantia</i>	0.3236	0.0809	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.1208	0.0652	12
<i>Lophogorgia chilensis</i>	0.0708	0.0319	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0014	0.0048	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0069	0.0111	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0042	0.0104	12
<i>Megathura crenulata</i>	0.0028	0.0065	12
<i>Crassedoma giganteum</i>	0.0139	0.0199	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.1028	0.0731	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
Santa Rosa Island - Rodes Reef			
<i>Tethya aurantia</i>	0.0986	0.0571	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0403	0.0270	12
<i>Lophogorgia chilensis</i>	0.0014	0.0048	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0097	0.0207	12
<i>Megathura crenulata</i>	0.0208	0.0247	12
<i>Crassedoma giganteum</i>	0.0028	0.0065	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0736	0.0534	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
Santa Cruz Island - Gull Island South			
<i>Tethya aurantia</i>	0.0625	0.0587	12
<i>Stylaster californica</i>	0.0778	0.1516	12
<i>Urticina lofotensis</i>	0.0014	0.0048	12
<i>Lophogorgia chilensis</i>	0.0375	0.0285	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0319	0.0329	12
<i>Megathura crenulata</i>	0.0014	0.0048	12
<i>Crassedoma giganteum</i>	0.0125	0.0161	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0361	0.0199	12
<i>Lytechinus anamesus</i>	0.0056	0.0148	12

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Cruz Island - Fry's Harbor			
<i>Tethya aurantia</i>	0.0111	0.0148	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.2361	0.2643	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0167	0.0225	12
<i>Megathura crenulata</i>	0.0167	0.0123	12
<i>Crassedoma giganteum</i>	0.0083	0.0112	12
<i>Aplysia californica</i>	0.0111	0.0130	12
<i>Pycnopodia helianthoides</i>	0.0667	0.0569	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
Santa Cruz Island - Pelican Bay			
<i>Tethya aurantia</i>	0.0236	0.0366	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.1847	0.1466	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0014	0.0048	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0069	0.0241	12
<i>Megathura crenulata</i>	0.0014	0.0048	12
<i>Crassedoma giganteum</i>	0.0181	0.0181	12
<i>Aplysia californica</i>	0.0194	0.0255	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	3.1833	1.0187	12
Santa Cruz Island - Scorpion Anchorage			
<i>Tethya aurantia</i>	0.0431	0.0609	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0042	0.0075	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0014	0.0048	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0000	0.0000	12
<i>Megathura crenulata</i>	0.0819	0.0500	12
<i>Crassedoma giganteum</i>	0.0542	0.0616	12
<i>Aplysia californica</i>	0.0042	0.0104	12
<i>Pycnopodia helianthoides</i>	0.0028	0.0065	12
<i>Lytechinus anamesus</i>	0.0125	0.0176	12

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Cruz Island - Yellow Banks			
<i>Tethya aurantia</i>	0.0278	0.0372	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0014	0.0048	12
<i>Lophogorgia chilensis</i>	0.1153	0.0575	12
<i>Muricea fruticosa</i>	0.0069	0.0150	12
<i>Muricea californica</i>	0.0139	0.0139	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0361	0.0234	12
<i>Megathura crenulata</i>	0.0194	0.0120	12
<i>Crassedoma giganteum</i>	0.0042	0.0104	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0028	0.0065	12
<i>Lytechinus anamesus</i>	0.4931	0.4381	12
Anacapa Island - Admiral's Reef			
<i>Tethya aurantia</i>	0.0069	0.0132	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0569	0.0359	12
<i>Muricea fruticosa</i>	0.0083	0.0167	12
<i>Muricea californica</i>	0.0250	0.0314	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0083	0.0133	12
<i>Megathura crenulata</i>	0.0972	0.0741	12
<i>Crassedoma giganteum</i>	0.0264	0.0321	12
<i>Aplysia californica</i>	0.0292	0.0342	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0028	0.0065	12
Anacapa Island - Cathedral Cove			
<i>Tethya aurantia</i>	0.0069	0.0111	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0028	0.0065	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0153	0.0261	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0000	0.0000	12
<i>Megathura crenulata</i>	0.0361	0.0425	12
<i>Crassedoma giganteum</i>	0.0250	0.0195	12
<i>Aplysia californica</i>	0.0167	0.0213	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Anacapa Island - Landing Cove			
<i>Tethya aurantia</i>	0.0056	0.0109	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0153	0.0166	12
<i>Muricea fruticosa</i>	0.0042	0.0104	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0403	0.0668	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0097	0.0132	12
<i>Megathura crenulata</i>	0.0264	0.0366	12
<i>Crassedoma giganteum</i>	0.2528	0.3284	12
<i>Aplysia californica</i>	0.0028	0.0065	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
Santa Barbara Island - SE Sea Lion Rookery			
<i>Tethya aurantia</i>	0.1194	0.0699	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.1667	0.0995	12
<i>Muricea fruticosa</i>	0.0028	0.0065	12
<i>Muricea californica</i>	0.0278	0.0239	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0014	0.0048	12
<i>Megathura crenulata</i>	0.0111	0.0082	12
<i>Crassedoma giganteum</i>	0.0069	0.0111	12
<i>Aplysia californica</i>	0.0153	0.0251	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0069	0.0194	12
Santa Barbara Island - Arch Point			
<i>Tethya aurantia</i>	0.0000	0.0000	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0014	0.0048	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0125	0.0294	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0000	0.0000	12
<i>Megathura crenulata</i>	0.0000	0.0000	12
<i>Crassedoma giganteum</i>	0.0056	0.0109	12
<i>Aplysia californica</i>	0.0639	0.0460	12
<i>Pycnopodia helianthoides</i>	0.0028	0.0065	12
<i>Lytechinus anamesus</i>	0.0236	0.0270	12

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
Santa Barbara Island - Cat Canyon			
<i>Tethya aurantia</i>	0.0000	0.0000	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0000	0.0000	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0000	0.0000	12
<i>Megathura crenulata</i>	0.0014	0.0048	12
<i>Crassedoma giganteum</i>	0.0069	0.0132	12
<i>Aplysia californica</i>	0.0722	0.0451	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0042	0.0075	12
San Clemente Island - Northwest Harbor			
<i>Tethya aurantia</i>	0.0000	0.0000	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0000	0.0000	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0444	0.0358	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0014	0.0048	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0236	0.0571	12
<i>Megathura crenulata</i>	0.0083	0.0087	12
<i>Crassedoma giganteum</i>	0.0000	0.0000	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
San Clemente Island - Boy Scout Camp			
<i>Tethya aurantia</i>	0.0014	0.0048	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0208	0.0247	12
<i>Muricea fruticosa</i>	0.0083	0.0112	12
<i>Muricea californica</i>	0.0597	0.0399	12
<i>Panulirus interruptus</i>	0.0097	0.0132	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0111	0.0192	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0000	0.0000	12
<i>Megathura crenulata</i>	0.0014	0.0048	12
<i>Crassedoma giganteum</i>	0.0042	0.0075	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12

2004 BAND TRANSECT DATA: MEAN NUMBER PER M<sup>2</sup>

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
San Clemente Island - Eel Point			
<i>Tethya aurantia</i>	0.0000	0.0000	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0000	0.0000	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0111	0.0130	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0014	0.0048	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0306	0.0425	12
<i>Megathura crenulata</i>	0.0167	0.0159	12
<i>Crassedoma giganteum</i>	0.0000	0.0000	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
San Clemente Island - Horse Beach Cove			
<i>Tethya aurantia</i>	0.0042	0.0104	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.0000	0.0000	12
<i>Lophogorgia chilensis</i>	0.0014	0.0048	12
<i>Muricea fruticosa</i>	0.0014	0.0048	12
<i>Muricea californica</i>	0.0611	0.0897	12
<i>Panulirus interruptus</i>	0.0417	0.0373	12
<i>Haliotis rufescens</i>	0.0000	0.0000	12
<i>Haliotis corrugata</i>	0.0042	0.0075	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0222	0.0320	12
<i>Megathura crenulata</i>	0.0222	0.0287	12
<i>Crassedoma giganteum</i>	0.0014	0.0048	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0000	0.0000	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12
San Miguel Island - Miracle Mile			
<i>Tethya aurantia</i>	0.2347	0.1276	12
<i>Stylaster californica</i>	0.0000	0.0000	12
<i>Urticina lofotensis</i>	0.2167	0.1253	12
<i>Lophogorgia chilensis</i>	0.0000	0.0000	12
<i>Muricea fruticosa</i>	0.0000	0.0000	12
<i>Muricea californica</i>	0.0000	0.0000	12
<i>Panulirus interruptus</i>	0.0000	0.0000	12
<i>Haliotis rufescens</i>	0.5500	0.6021	12
<i>Haliotis corrugata</i>	0.0000	0.0000	12
<i>Haliotis fulgens</i>	0.0000	0.0000	12
<i>Kelletia kelletii</i>	0.0167	0.0326	12
<i>Megathura crenulata</i>	0.0583	0.0405	12
<i>Crassedoma giganteum</i>	0.0111	0.0130	12
<i>Aplysia californica</i>	0.0000	0.0000	12
<i>Pycnopodia helianthoides</i>	0.0486	0.0288	12
<i>Lytechinus anamesus</i>	0.0000	0.0000	12

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>San Miguel Island - Wyckoff Ledge</b>			
<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	1.000	1.8420	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.333	0.8797	15
<i>Macrocystis pyrifera All</i>	11.667	13.8444	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.833	3.2275	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	3.500	3.9866	15
<i>Articulated Coralline Algae</i>	6.167	9.1548	15
<i>Encrusting Coralline Algae</i>	21.333	10.0386	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	1.667	1.8094	15
<i>Corynactis californica</i>	0.333	1.2910	15
<i>Balanophyllia elegans</i>	2.333	3.0570	15
<i>Astrangia lajollaensis</i>	0.167	0.6455	15
<i>Diopatra ornata</i>	9.667	9.9043	15
<i>Phragmatopoma californica</i>	14.167	12.9099	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	16.167	10.6849	15
<i>Diaperoecia californica</i>	0.167	0.6455	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	1.333	3.2550	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	12.667	8.3702	15
<i>Bare Substrate</i>	29.000	28.3914	15
<i>Rock</i>	66.500	28.4856	15
<i>Cobble</i>	4.000	8.4937	15
<i>Sand</i>	29.500	23.4749	15
<b>San Miguel Island - Hare Rock</b>			
<i>Green Algae</i>	1.667	2.4398	15
<i>Miscellaneous Brown Algae</i>	1.167	2.6502	15
<i>Desmarestia Spp.</i>	13.000	24.4255	15
<i>Cystoseira Spp.</i>	0.667	1.4840	15
<i>Macrocystis pyrifera All</i>	15.167	12.6232	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	2.000	3.0178	15
<i>Articulated Coralline Algae</i>	0.667	1.1443	15
<i>Encrusting Coralline Algae</i>	32.500	14.7902	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.500	1.0351	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	0.000	0.0000	15
<i>Corynactis californica</i>	7.500	9.2099	15
<i>Balanophyllia elegans</i>	1.667	2.0412	15
<i>Astrangia lajollaensis</i>	1.667	2.9378	15
<i>Diopatra ornata</i>	2.167	3.5187	15
<i>Phragmatopoma californica</i>	11.833	10.9572	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	12.667	11.5134	15
<i>Diaperoecia californica</i>	0.333	0.8797	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	0.167	0.6455	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	10.667	7.8186	15
<i>Bare Substrate</i>	17.833	19.3849	15
<i>Rock</i>	77.833	26.8239	15
<i>Cobble</i>	16.333	24.1622	15
<i>Sand</i>	5.833	8.6946	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Santa Rosa Island - Johnson's Lee North</b>			
<i>Green Algae</i>	0.167	0.6455	15
<i>Miscellaneous Brown Algae</i>	0.500	1.4015	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	6.000	8.8034	15
<i>Macrocystis pyrifera All</i>	14.000	7.1214	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	7.833	8.2844	15
<i>Laminaria farlowii All</i>	0.167	0.6455	15
<i>Miscellaneous Red Algae</i>	32.167	9.7681	15
<i>Articulated Coralline Algae</i>	2.500	2.6726	15
<i>Encrusting Coralline Algae</i>	5.000	4.8181	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	4.000	5.3285	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	4.833	6.0847	15
<i>Sponges</i>	3.333	2.6163	15
<i>Corynactis californica</i>	2.833	4.6162	15
<i>Balanophyllia elegans</i>	2.000	2.1547	15
<i>Astrangia lajollaensis</i>	1.167	1.8581	15
<i>Diopatra ornata</i>	1.000	2.0702	15
<i>Phragmatopoma californica</i>	1.833	4.1690	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	10.333	8.1759	15
<i>Diaperoecia californica</i>	0.667	1.9970	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	5.500	4.2468	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	13.333	6.1721	15
<i>Bare Substrate</i>	15.333	10.9735	15
<i>Rock</i>	85.667	15.9090	15
<i>Cobble</i>	1.667	3.3630	15
<i>Sand</i>	12.667	16.6226	15

**Santa Rosa Island - Johnson's Lee South**

<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	2.000	2.5355	15
<i>Desmarestia Spp.</i>	0.500	1.4015	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	7.167	10.6430	15
<i>Eisenia arborea All</i>	0.500	1.4015	15
<i>Pterygophora californica All</i>	0.500	1.4015	15
<i>Laminaria farlowii All</i>	2.833	3.9940	15
<i>Miscellaneous Red Algae</i>	26.167	14.0746	15
<i>Articulated Coralline Algae</i>	6.667	5.6432	15
<i>Encrusting Coralline Algae</i>	14.833	8.4762	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	9.667	13.6233	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	1.167	1.8581	15
<i>Sponges</i>	3.000	2.5355	15
<i>Corynactis californica</i>	5.667	9.0370	15
<i>Balanophyllia elegans</i>	4.333	7.0373	15
<i>Astrangia lajollaensis</i>	1.833	2.9073	15
<i>Diopatra ornata</i>	9.667	7.9545	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.167	0.6455	15
<i>Miscellaneous Bryozoans</i>	17.000	9.7834	15
<i>Diaperoecia californica</i>	2.500	3.5355	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.333	0.8797	15
<i>Tunicates</i>	3.167	3.9491	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	13.333	8.4339	15
<i>Bare Substrate</i>	28.333	18.7718	15
<i>Rock</i>	69.833	17.6136	15
<i>Cobble</i>	4.167	5.6432	15
<i>Sand</i>	26.000	15.8621	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Santa Rosa Island - Rodes Reef</b>			
<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	0.000	0.0000	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	9.000	12.3129	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	4.667	4.9881	15
<i>Articulated Coralline Algae</i>	0.167	0.6455	15
<i>Encrusting Coralline Algae</i>	41.000	10.3854	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	1.500	2.2756	15
<i>Corynactis californica</i>	0.167	0.6455	15
<i>Balanophyllia elegans</i>	1.500	2.0702	15
<i>Astrangia lajollaensis</i>	8.000	8.5147	15
<i>Diopatra ornata</i>	6.333	6.8051	15
<i>Phragmatopoma californica</i>	6.333	10.8095	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	11.833	5.8605	15
<i>Diaperoecia californica</i>	1.333	2.6502	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	1.500	1.8420	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	15.167	6.7788	15
<i>Bare Substrate</i>	9.833	8.6327	15
<i>Rock</i>	87.667	15.6829	15
<i>Cobble</i>	9.167	13.4850	15
<i>Sand</i>	3.167	4.5774	15
<b>Santa Cruz Island - Gull Island South</b>			
<i>Green Algae</i>	0.333	0.8797	15
<i>Miscellaneous Brown Algae</i>	0.500	1.0351	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.333	1.2910	15
<i>Macrocystis pyrifera All</i>	24.000	15.6639	15
<i>Eisenia arborea All</i>	5.167	6.3714	15
<i>Pterygophora californica All</i>	0.667	1.4840	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	29.333	12.2644	15
<i>Articulated Coralline Algae</i>	1.500	2.2756	15
<i>Encrusting Coralline Algae</i>	31.833	16.1871	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	1.667	1.8094	15
<i>Corynactis californica</i>	2.000	3.1623	15
<i>Balanophyllia elegans</i>	1.333	1.2910	15
<i>Astrangia lajollaensis</i>	1.667	2.7817	15
<i>Diopatra ornata</i>	0.167	0.6455	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.167	0.6455	15
<i>Miscellaneous Bryozoans</i>	16.167	9.9493	15
<i>Diaperoecia californica</i>	8.000	7.9732	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	3.167	2.2093	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	24.833	8.7865	15
<i>Bare Substrate</i>	1.667	1.8094	15
<i>Rock</i>	98.167	2.4029	15
<i>Cobble</i>	1.000	1.5811	15
<i>Sand</i>	0.833	1.2199	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Santa Cruz Island - Fry's Harbor</b>			
<i>Green Algae</i>	5.833	4.7871	15
<i>Miscellaneous Brown Algae</i>	0.500	1.0351	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.167	0.6455	15
<i>Macrocystis pyrifera All</i>	0.333	1.2910	15
<i>Eisenia arborea All</i>	1.333	2.2887	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	24.500	5.7632	15
<i>Articulated Coralline Algae</i>	1.167	1.5999	15
<i>Encrusting Coralline Algae</i>	33.000	10.4454	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	2.000	2.3528	15
<i>Sponges</i>	0.000	0.0000	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.500	1.0351	15
<i>Astrangia lajollaensis</i>	14.667	6.4688	15
<i>Diopatra ornata</i>	0.000	0.0000	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	8.500	4.9821	15
<i>Diaperoecia californica</i>	3.333	8.5391	15
<i>Pachythyone rubra</i>	0.833	3.2275	15
<i>Ophiothrix spiculata</i>	0.167	0.6455	15
<i>Tunicates</i>	0.000	0.0000	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	13.167	8.4762	15
<i>Bare Substrate</i>	13.667	13.2243	15
<i>Rock</i>	83.833	12.2426	15
<i>Cobble</i>	10.000	9.5898	15
<i>Sand</i>	6.167	10.3883	15
<b>Santa Cruz Island - Pelican Bay</b>			
<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	0.167	0.6455	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	0.000	0.0000	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	0.333	0.8797	15
<i>Articulated Coralline Algae</i>	0.000	0.0000	15
<i>Encrusting Coralline Algae</i>	30.500	14.2114	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.333	0.8797	15
<i>Sponges</i>	0.000	0.0000	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	11.667	8.0549	15
<i>Diopatra ornata</i>	0.167	0.6455	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	0.167	0.6455	15
<i>Diaperoecia californica</i>	0.833	3.2275	15
<i>Pachythyone rubra</i>	0.167	0.6455	15
<i>Ophiothrix spiculata</i>	0.333	0.8797	15
<i>Tunicates</i>	0.000	0.0000	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	12.000	5.2780	15
<i>Bare Substrate</i>	50.333	20.8495	15
<i>Rock</i>	59.333	20.0772	15
<i>Cobble</i>	9.500	9.1710	15
<i>Sand</i>	31.167	17.5221	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Santa Cruz Island - Scorpion Anchorage</b>			
<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	0.167	0.6455	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	0.000	0.0000	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	1.667	2.2493	15
<i>Articulated Coralline Algae</i>	0.000	0.0000	15
<i>Encrusting Coralline Algae</i>	37.167	11.1350	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	15.833	10.5079	15
<i>Sponges</i>	0.000	0.0000	15
<i>Corynactis californica</i>	0.333	1.2910	15
<i>Balanophyllia elegans</i>	0.167	0.6455	15
<i>Astrangia lajollaensis</i>	1.000	1.2677	15
<i>Diopatra ornata</i>	0.000	0.0000	15
<i>Phragmatopoma californica</i>	1.667	6.4550	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	0.333	1.2910	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	0.000	0.0000	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	12.333	8.0438	15
<i>Bare Substrate</i>	31.500	10.1242	15
<i>Rock</i>	82.333	18.1872	15
<i>Cobble</i>	0.500	1.0351	15
<i>Sand</i>	17.167	18.3679	15

**Santa Cruz Island - Yellow Banks**

<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	0.167	0.6455	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.833	1.5430	15
<i>Macrocystis pyrifera All</i>	19.833	12.3732	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	1.500	2.0702	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	0.000	0.0000	15
<i>Articulated Coralline Algae</i>	1.667	2.0412	15
<i>Encrusting Coralline Algae</i>	32.333	8.1540	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	0.667	1.9970	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.667	1.7593	15
<i>Astrangia lajollaensis</i>	2.833	2.9681	15
<i>Diopatra ornata</i>	0.333	0.8797	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	7.667	7.1005	15
<i>Diaperoecia californica</i>	0.167	0.6455	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	1.333	1.2910	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	37.500	11.8019	15
<i>Bare Substrate</i>	19.333	17.0469	15
<i>Rock</i>	79.667	20.3730	15
<i>Cobble</i>	9.167	10.5503	15
<i>Sand</i>	11.167	11.5676	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Anacapa Island - Admiral's Reef</b>			
<i>Green Algae</i>	0.667	1.1443	15
<i>Miscellaneous Brown Algae</i>	3.500	4.2046	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	0.500	1.9365	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	19.833	14.6222	15
<i>Articulated Coralline Algae</i>	0.333	0.8797	15
<i>Encrusting Coralline Algae</i>	33.833	16.7936	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	3.167	3.0570	15
<i>Sponges</i>	1.000	1.8420	15
<i>Corynactis californica</i>	3.000	4.6483	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	0.667	1.4840	15
<i>Diopatra ornata</i>	0.000	0.0000	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	1.833	3.1997	15
<i>Diaperoecia californica</i>	1.000	1.5811	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	39.333	31.8264	15
<i>Tunicates</i>	0.333	0.8797	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	16.833	11.0384	15
<i>Bare Substrate</i>	27.667	18.4068	15
<i>Rock</i>	83.167	19.8311	15
<i>Cobble</i>	0.667	1.9970	15
<i>Sand</i>	16.167	18.6573	15
<b>Anacapa Island - Cathedral Cove</b>			
<i>Green Algae</i>	0.833	1.8094	15
<i>Miscellaneous Brown Algae</i>	10.667	8.8875	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	8.833	10.7681	15
<i>Macrocystis pyrifera All</i>	10.333	16.0320	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	1.667	3.4932	15
<i>Articulated Coralline Algae</i>	10.833	9.1450	15
<i>Encrusting Coralline Algae</i>	31.167	17.1617	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	7.667	6.1577	15
<i>Sponges</i>	0.333	0.8797	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	0.833	1.5430	15
<i>Diopatra ornata</i>	0.333	1.2910	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	7.833	5.9662	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	0.500	1.0351	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	7.000	6.2106	15
<i>Bare Substrate</i>	21.333	12.6373	15
<i>Rock</i>	63.500	30.0268	15
<i>Cobble</i>	19.500	23.9829	15
<i>Sand</i>	17.000	18.7369	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Anacapa Island - Landing Cove</b>			
<i>Green Algae</i>	0.333	1.2910	15
<i>Miscellaneous Brown Algae</i>	3.333	4.4987	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	3.667	5.4171	15
<i>Macrocystis pyrifera All</i>	24.167	16.4389	15
<i>Eisenia arborea All</i>	9.333	12.5878	15
<i>Pterygophora californica All</i>	1.333	2.8137	15
<i>Laminaria farlowii All</i>	16.500	14.4482	15
<i>Miscellaneous Red Algae</i>	21.833	19.2137	15
<i>Articulated Coralline Algae</i>	12.833	6.4688	15
<i>Encrusting Coralline Algae</i>	31.667	22.6122	15
<i>Gelidium Spp.</i>	20.167	32.1196	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.167	0.6455	15
<i>Sponges</i>	7.000	10.9054	15
<i>Corynactis californica</i>	2.167	3.2550	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	0.500	1.0351	15
<i>Diopatra ornata</i>	0.000	0.0000	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.500	1.4015	15
<i>Miscellaneous Bryozoans</i>	16.333	14.3261	15
<i>Diaperoecia californica</i>	4.167	6.5238	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	1.167	1.5999	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	9.000	8.6499	15
<i>Bare Substrate</i>	30.833	28.4835	15
<i>Rock</i>	58.000	40.9508	15
<i>Cobble</i>	23.500	22.7329	15
<i>Sand</i>	18.500	22.9479	15
<b>Santa Barbara Island - SE Sea Lion Rookery</b>			
<i>Green Algae</i>	1.333	2.6502	15
<i>Miscellaneous Brown Algae</i>	0.000	0.0000	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	0.000	0.0000	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	4.500	5.1927	15
<i>Articulated Coralline Algae</i>	1.000	1.5811	15
<i>Encrusting Coralline Algae</i>	62.667	15.3666	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.167	0.6455	15
<i>Sponges</i>	0.167	0.6455	15
<i>Corynactis californica</i>	1.333	2.0845	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	1.000	1.8420	15
<i>Diopatra ornata</i>	0.000	0.0000	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	0.333	0.8797	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	31.833	28.5430	15
<i>Tunicates</i>	0.667	1.1443	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	5.833	5.7217	15
<i>Bare Substrate</i>	25.500	17.5051	15
<i>Rock</i>	85.833	19.9478	15
<i>Cobble</i>	3.833	7.6103	15
<i>Sand</i>	10.333	18.5854	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>Santa Barbara Island - Arch Point</b>			
<i>Green Algae</i>	3.500	4.7056	15
<i>Miscellaneous Brown Algae</i>	3.667	4.7119	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	0.167	0.6455	15
<i>Eisenia arborea All</i>	1.167	4.5185	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	22.500	8.1284	15
<i>Articulated Coralline Algae</i>	3.167	8.9376	15
<i>Encrusting Coralline Algae</i>	53.833	11.6061	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	1.000	1.5811	15
<i>Sponges</i>	0.167	0.6455	15
<i>Corynactis californica</i>	2.167	2.6502	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	0.167	0.6455	15
<i>Diopatra ornata</i>	0.167	0.6455	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	0.667	1.9970	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	0.500	1.0351	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	7.333	7.6454	15
<i>Bare Substrate</i>	16.667	10.8012	15
<i>Rock</i>	87.333	12.7988	15
<i>Cobble</i>	11.667	12.3804	15
<i>Sand</i>	1.000	1.5811	15

**Santa Barbara Island - Cat Canyon**

<i>Green Algae</i>	0.167	0.6455	15
<i>Miscellaneous Brown Algae</i>	0.500	1.0351	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.000	0.0000	15
<i>Macrocystis pyrifera All</i>	0.000	0.0000	15
<i>Eisenia arborea All</i>	0.000	0.0000	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	8.000	3.8032	15
<i>Articulated Coralline Algae</i>	0.833	1.2199	15
<i>Encrusting Coralline Algae</i>	63.500	11.1724	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	0.167	0.6455	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.167	0.6455	15
<i>Astrangia lajollaensis</i>	2.500	2.9881	15
<i>Diopatra ornata</i>	0.167	0.6455	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	0.000	0.0000	15
<i>Miscellaneous Bryozoans</i>	0.833	1.5430	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	0.167	0.6455	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	5.667	7.5277	15
<i>Bare Substrate</i>	26.833	12.2280	15
<i>Rock</i>	89.500	9.0731	15
<i>Cobble</i>	0.333	1.2910	15
<i>Sand</i>	10.167	8.4762	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>San Clemente Island - Northwest Harbor</b>			
<i>Green Algae</i>	0.500	1.4015	15
<i>Miscellaneous Brown Algae</i>	6.000	6.3948	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.333	1.2910	15
<i>Macrocystis pyrifera All</i>	35.167	25.5383	15
<i>Eisenia arborea All</i>	4.000	7.7229	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	43.000	18.0079	15
<i>Articulated Coralline Algae</i>	23.000	11.1883	15
<i>Encrusting Coralline Algae</i>	13.833	4.6162	15
<i>Gelidium Spp.</i>	7.500	6.7480	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	3.667	3.6433	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.167	0.6455	15
<i>Astrangia lajollaensis</i>	2.667	3.4675	15
<i>Diopatra ornata</i>	0.000	0.0000	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	2.000	1.9365	15
<i>Miscellaneous Bryozoans</i>	2.667	2.7495	15
<i>Diaperoecia californica</i>	0.667	1.7593	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	5.167	4.2748	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	0.833	1.5430	15
<i>Bare Substrate</i>	33.667	23.8647	15
<i>Rock</i>	73.833	23.4305	15
<i>Cobble</i>	1.667	3.4932	15
<i>Sand</i>	24.500	23.7397	15

**San Clemente Island - Boy Scout Camp**

<i>Green Algae</i>	9.000	23.4483	15
<i>Miscellaneous Brown Algae</i>	22.833	23.6203	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	1.833	1.9970	15
<i>Macrocystis pyrifera All</i>	12.833	14.4502	15
<i>Eisenia arborea All</i>	2.333	2.5820	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	4.667	4.8978	15
<i>Miscellaneous Red Algae</i>	5.667	6.5783	15
<i>Articulated Coralline Algae</i>	1.333	2.0845	15
<i>Encrusting Coralline Algae</i>	32.333	16.8360	15
<i>Gelidium Spp.</i>	0.000	0.0000	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	1.500	2.0702	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	0.000	0.0000	15
<i>Diopatra ornata</i>	0.333	0.8797	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	6.500	6.1818	15
<i>Miscellaneous Bryozoans</i>	15.667	9.7498	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	15.167	9.0862	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	5.667	5.0415	15
<i>Bare Substrate</i>	27.000	16.9611	15
<i>Rock</i>	80.833	16.5472	15
<i>Cobble</i>	1.667	2.4398	15
<i>Sand</i>	17.500	15.8396	15

<u>Species</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<b>San Clemente Island - Eel Point</b>			
<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	8.333	7.4202	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	0.167	0.6455	15
<i>Macrocystis pyrifera All</i>	21.000	20.4153	15
<i>Eisenia arborea All</i>	0.167	0.6455	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	0.000	0.0000	15
<i>Miscellaneous Red Algae</i>	41.000	14.9045	15
<i>Articulated Coralline Algae</i>	35.500	26.7128	15
<i>Encrusting Coralline Algae</i>	16.167	8.3915	15
<i>Gelidium Spp.</i>	3.000	6.1383	15
<i>Gigartina Spp.</i>	0.333	0.8797	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	4.333	2.9073	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.167	0.6455	15
<i>Astrangia lajollaensis</i>	0.000	0.0000	15
<i>Diopatra ornata</i>	0.333	0.8797	15
<i>Phragmatopoma californica</i>	0.500	1.4015	15
<i>Serpulorbis squamigerus</i>	6.667	3.8576	15
<i>Miscellaneous Bryozoans</i>	3.500	3.7559	15
<i>Diaperoecia californica</i>	0.000	0.0000	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	3.167	3.4675	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	17.333	7.3477	15
<i>Bare Substrate</i>	14.167	14.7499	15
<i>Rock</i>	86.667	17.2344	15
<i>Cobble</i>	5.667	8.9874	15
<i>Sand</i>	7.667	11.8573	15

**San Clemente Island - Horse Beach Cove**

<i>Green Algae</i>	0.000	0.0000	15
<i>Miscellaneous Brown Algae</i>	7.167	8.0104	15
<i>Desmarestia Spp.</i>	0.000	0.0000	15
<i>Cystoseira Spp.</i>	2.500	3.1339	15
<i>Macrocystis pyrifera All</i>	13.667	11.4512	15
<i>Eisenia arborea All</i>	2.167	3.8807	15
<i>Pterygophora californica All</i>	0.000	0.0000	15
<i>Laminaria farlowii All</i>	1.333	3.6433	15
<i>Miscellaneous Red Algae</i>	23.000	15.9855	15
<i>Articulated Coralline Algae</i>	7.833	6.9991	15
<i>Encrusting Coralline Algae</i>	14.000	8.2808	15
<i>Gelidium Spp.</i>	1.833	3.0570	15
<i>Gigartina Spp.</i>	0.000	0.0000	15
<i>Miscellaneous Plants (ie: Diatoms)</i>	0.000	0.0000	15
<i>Sponges</i>	2.500	2.5000	15
<i>Corynactis californica</i>	0.000	0.0000	15
<i>Balanophyllia elegans</i>	0.000	0.0000	15
<i>Astrangia lajollaensis</i>	0.000	0.0000	15
<i>Diopatra ornata</i>	1.500	2.0702	15
<i>Phragmatopoma californica</i>	0.000	0.0000	15
<i>Serpulorbis squamigerus</i>	8.667	8.8573	15
<i>Miscellaneous Bryozoans</i>	4.500	3.3004	15
<i>Diaperoecia californica</i>	0.333	0.8797	15
<i>Pachythyone rubra</i>	0.000	0.0000	15
<i>Ophiothrix spiculata</i>	0.000	0.0000	15
<i>Tunicates</i>	7.500	4.9099	15
<i>Miscellaneous Invertebrates excluding Ophiothrix spiculata</i>	27.833	9.2034	15
<i>Bare Substrate</i>	23.000	17.4796	15
<i>Rock</i>	72.833	22.7539	15
<i>Cobble</i>	11.167	13.2916	15
<i>Sand</i>	16.000	15.2304	15

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)

## San Miguel Island - Wyckoff Ledge

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Chromis punctipinnis</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Adult	7/28/2004	0.2500	0.5000	4
<i>Sebastes mystinus</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	7/28/2004	1.7500	2.8723	4
<i>Sebastes serranoides</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	9/29/2004	0.2500	0.4629	8
<i>Sebastes atrovirens</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/29/2004	0.1250	0.3536	8
<i>Paralabrax clathratus</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Male	7/28/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/29/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	7/28/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	9/29/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	7/28/2004	0.5000	0.5774	4
<i>Embiotoca lateralis</i> Adult	9/29/2004	0.5000	0.9258	8
<i>Embiotoca lateralis</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/29/2004	0.2500	0.4629	8
<i>Damalichthys vacca</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	7/28/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Juvenile	7/28/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	7/28/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/29/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	7/28/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/29/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
San Miguel Island - Hare Rock

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/27/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Chromis punctipinnis</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/29/2004	0.6250	1.7678	8
<i>Oxyjulis californica</i> Adult	7/27/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	9/29/2004	7.1250	10.1621	8
<i>Oxyjulis californica</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/29/2004	6.2500	7.1664	8
<i>Sebastes mystinus</i> Adult	7/27/2004	2.2500	2.6300	4
<i>Sebastes mystinus</i> Adult	9/29/2004	1.5000	1.5119	8
<i>Sebastes mystinus</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	7/27/2004	0.5000	1.0000	4
<i>Sebastes serranoides</i> Adult	9/29/2004	0.2500	0.4629	8
<i>Sebastes serranoides</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	7/27/2004	0.2500	0.5000	4
<i>Sebastes atrovirens</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/29/2004	0.2500	0.4629	8
<i>Paralabrax clathratus</i> Adult	7/27/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Male	7/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/29/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	7/27/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	9/29/2004	0.7500	0.8864	8
<i>Semicossyphus pulcher</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	7/27/2004	0.5000	1.0000	4
<i>Embiotoca jacksoni</i> Adult	9/29/2004	0.3750	0.7440	8
<i>Embiotoca jacksoni</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	7/27/2004	2.0000	3.3665	4
<i>Embiotoca lateralis</i> Adult	9/29/2004	0.7500	0.8864	8
<i>Embiotoca lateralis</i> Juvenile	7/27/2004	1.0000	2.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/29/2004	1.0000	1.1952	8
<i>Damalichthys vacca</i> Adult	7/27/2004	1.0000	1.4142	4
<i>Damalichthys vacca</i> Adult	9/29/2004	0.5000	0.7559	8
<i>Damalichthys vacca</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	7/27/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	7/27/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	9/29/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Juvenile	7/27/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/29/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	7/27/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/29/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	7/27/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/29/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Rosa Island - Johnson's Lee North

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/29/2004	0.2500	0.5000	4
<i>Chromis punctipinnis</i> Adult	8/25/2004	7.2500	7.3655	4
<i>Chromis punctipinnis</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/29/2004	1.7500	2.3629	4
<i>Oxyjulis californica</i> Adult	8/25/2004	1.2500	1.5000	4
<i>Oxyjulis californica</i> Juvenile	7/29/2004	0.2500	0.5000	4
<i>Oxyjulis californica</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/29/2004	0.5000	0.5774	4
<i>Sebastes mystinus</i> Adult	8/25/2004	0.7500	0.9574	4
<i>Sebastes mystinus</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	7/29/2004	0.5000	1.0000	4
<i>Sebastes serranoides</i> Adult	8/25/2004	0.2500	0.5000	4
<i>Sebastes serranoides</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	7/29/2004	0.7500	1.5000	4
<i>Sebastes atrovirens</i> Adult	8/25/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	7/29/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Adult	8/25/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/29/2004	0.7500	0.5000	4
<i>Semicossyphus pulcher</i> Male	8/25/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	7/29/2004	0.7500	0.5000	4
<i>Semicossyphus pulcher</i> Female	8/25/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	7/29/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Adult	8/25/2004	1.0000	0.8165	4
<i>Embiotoca jacksoni</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	8/25/2004	0.2500	0.5000	4
<i>Embiotoca lateralis</i> Adult	7/29/2004	2.2500	0.9574	4
<i>Embiotoca lateralis</i> Adult	8/25/2004	2.0000	0.8165	4
<i>Embiotoca lateralis</i> Juvenile	7/29/2004	0.2500	0.5000	4
<i>Embiotoca lateralis</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	7/29/2004	1.7500	1.7078	4
<i>Damalichthys vacca</i> Adult	8/25/2004	0.7500	0.9574	4
<i>Damalichthys vacca</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	7/29/2004	0.7500	0.9574	4
<i>Hypsypops rubicundus</i> Adult	8/25/2004	0.5000	0.5774	4
<i>Hypsypops rubicundus</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/29/2004	0.2500	0.5000	4
<i>Girella nigricans</i> Adult	8/25/2004	0.2500	0.5000	4
<i>Girella nigricans</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	8/25/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/29/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/25/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	7/29/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	8/25/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Rosa Island - Johnson's Lee South

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/29/2004	0.7500	0.9574	4
<i>Chromis punctipinnis</i> Adult	8/24/2004	2.8750	3.5632	8
<i>Chromis punctipinnis</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Adult	7/29/2004	7.7500	8.3815	4
<i>Oxyjulis californica</i> Adult	8/24/2004	1.8750	1.5526	8
<i>Oxyjulis californica</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Adult	7/29/2004	1.2500	1.2583	4
<i>Sebastes mystinus</i> Adult	8/24/2004	1.1250	0.9910	8
<i>Sebastes mystinus</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	7/29/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	8/24/2004	0.7500	0.4629	8
<i>Sebastes serranoides</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	7/29/2004	1.7500	2.3629	4
<i>Sebastes atrovirens</i> Adult	8/24/2004	0.3750	0.5175	8
<i>Sebastes atrovirens</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Adult	7/29/2004	0.5000	0.5774	4
<i>Paralabrax clathratus</i> Adult	8/24/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Male	7/29/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Male	8/24/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	7/29/2004	0.5000	1.0000	4
<i>Semicossyphus pulcher</i> Female	8/24/2004	0.1250	0.3536	8
<i>Semicossyphus pulcher</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	7/29/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	8/24/2004	0.6250	0.7440	8
<i>Embiotoca jacksoni</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	7/29/2004	1.5000	1.7321	4
<i>Embiotoca lateralis</i> Adult	8/24/2004	3.0000	1.6903	8
<i>Embiotoca lateralis</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Adult	7/29/2004	1.2500	0.9574	4
<i>Damalichthys vacca</i> Adult	8/24/2004	1.1250	2.1002	8
<i>Damalichthys vacca</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	7/29/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	8/24/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	7/29/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	8/24/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Juvenile	7/29/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	8/24/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	7/29/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/24/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	7/29/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	8/24/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Rosa Island - Rodes Reef

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/26/2004	5.2500	9.8446	4
<i>Chromis punctipinnis</i> Adult	9/27/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/26/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	9/27/2004	1.7500	2.3629	4
<i>Oxyjulis californica</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/26/2004	1.0000	1.4142	4
<i>Sebastes mystinus</i> Adult	9/27/2004	0.7500	0.9574	4
<i>Sebastes mystinus</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	7/26/2004	0.2500	0.5000	4
<i>Sebastes serranoides</i> Adult	9/27/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	7/26/2004	0.2500	0.5000	4
<i>Sebastes atrovirens</i> Adult	9/27/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	7/26/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	9/27/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/26/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	7/26/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	9/27/2004	0.5000	0.5774	4
<i>Semicossyphus pulcher</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	7/26/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Adult	9/27/2004	0.5000	1.0000	4
<i>Embiotoca jacksoni</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/27/2004	1.0000	1.4142	4
<i>Embiotoca lateralis</i> Adult	7/26/2004	0.2500	0.5000	4
<i>Embiotoca lateralis</i> Adult	9/27/2004	2.2500	3.8622	4
<i>Embiotoca lateralis</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	7/26/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	9/27/2004	0.7500	0.9574	4
<i>Damalichthys vacca</i> Juvenile	7/26/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	7/26/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	9/27/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/26/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	9/27/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	7/26/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/27/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/26/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/27/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	7/26/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/27/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Cruz Island - Gull Island South

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/13/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Adult	8/24/2004	4.7500	6.2383	4
<i>Chromis punctipinnis</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/13/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	8/24/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/13/2004	3.0000	6.0000	4
<i>Sebastes mystinus</i> Adult	8/24/2004	0.5000	1.0000	4
<i>Sebastes mystinus</i> Juvenile	7/13/2004	0.7500	1.5000	4
<i>Sebastes mystinus</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	7/13/2004	0.5000	1.0000	4
<i>Sebastes serranoides</i> Adult	8/24/2004	0.2500	0.5000	4
<i>Sebastes serranoides</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	7/13/2004	1.0000	0.8165	4
<i>Sebastes atrovirens</i> Adult	8/24/2004	1.0000	0.8165	4
<i>Sebastes atrovirens</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	8/24/2004	0.5000	0.5774	4
<i>Paralabrax clathratus</i> Adult	7/13/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	8/24/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/13/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Male	8/24/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	7/13/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	8/24/2004	1.0000	0.8165	4
<i>Semicossyphus pulcher</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	7/13/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Adult	8/24/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	8/24/2004	0.2500	0.5000	4
<i>Embiotoca lateralis</i> Adult	7/13/2004	0.2500	0.5000	4
<i>Embiotoca lateralis</i> Adult	8/24/2004	0.2500	0.5000	4
<i>Embiotoca lateralis</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	8/24/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Adult	7/13/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Adult	8/24/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	7/13/2004	0.5000	1.0000	4
<i>Damalichthys vacca</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	7/13/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	8/24/2004	0.5000	0.5774	4
<i>Hypsypops rubicundus</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/13/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	8/24/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	7/13/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	8/24/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/13/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/24/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	7/13/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	8/24/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Cruz Island - Fry's Harbor

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/15/2004	33.2500	26.2345	4
<i>Chromis punctipinnis</i> Adult	8/27/2004	3.0000	2.6726	8
<i>Chromis punctipinnis</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Adult	7/15/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Adult	7/15/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Juvenile	7/15/2004	1.2500	2.5000	4
<i>Sebastes mystinus</i> Juvenile	8/27/2004	1.0000	1.4142	8
<i>Sebastes serranoides</i> Adult	7/15/2004	1.0000	0.8165	4
<i>Sebastes serranoides</i> Adult	8/27/2004	0.2500	0.4629	8
<i>Sebastes serranoides</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	7/15/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Adult	7/15/2004	1.0000	0.8165	4
<i>Paralabrax clathratus</i> Adult	8/27/2004	0.3750	0.5175	8
<i>Paralabrax clathratus</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Male	7/15/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	8/27/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	7/15/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	8/27/2004	0.5000	0.5345	8
<i>Semicossyphus pulcher</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	7/15/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	7/15/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Adult	7/15/2004	2.0000	1.1547	4
<i>Damalichthys vacca</i> Adult	8/27/2004	1.2500	1.7525	8
<i>Damalichthys vacca</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	7/15/2004	0.7500	0.9574	4
<i>Hypsypops rubicundus</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	7/15/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	8/27/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Juvenile	7/15/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	8/27/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	7/15/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/27/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	7/15/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	8/27/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Cruz Island - Pelican Bay

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/14/2004	0.5000	1.0000	4
<i>Chromis punctipinnis</i> Adult	9/30/2004	0.7500	0.7071	8
<i>Chromis punctipinnis</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/30/2004	2.6250	5.0409	8
<i>Oxyjulis californica</i> Adult	7/14/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	9/30/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Adult	7/14/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	9/30/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	7/14/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	9/30/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	7/14/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	9/30/2004	0.2500	0.4629	8
<i>Sebastes atrovirens</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Adult	7/14/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Adult	9/30/2004	1.1250	1.1260	8
<i>Paralabrax clathratus</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/30/2004	1.7500	1.2817	8
<i>Semicossyphus pulcher</i> Male	7/14/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/30/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	7/14/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	9/30/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	7/14/2004	0.7500	0.9574	4
<i>Embiotoca jacksoni</i> Adult	9/30/2004	1.0000	1.0690	8
<i>Embiotoca jacksoni</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	7/14/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	9/30/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Adult	7/14/2004	0.7500	0.9574	4
<i>Damalichthys vacca</i> Adult	9/30/2004	1.1250	1.8077	8
<i>Damalichthys vacca</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	7/14/2004	1.0000	0.8165	4
<i>Hypsypops rubicundus</i> Adult	9/30/2004	0.7500	0.7071	8
<i>Hypsypops rubicundus</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	7/14/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	9/30/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Juvenile	7/14/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/30/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	7/14/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/30/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	7/14/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/30/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Cruz Island - Scorpion Anchorage

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	8/12/2004	4.2500	2.6300	4
<i>Chromis punctipinnis</i> Adult	9/17/2004	0.2500	0.4629	8
<i>Chromis punctipinnis</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/17/2004	18.8750	36.2390	8
<i>Oxyjulis californica</i> Adult	8/12/2004	0.7500	0.5000	4
<i>Oxyjulis californica</i> Adult	9/17/2004	4.8750	3.7583	8
<i>Oxyjulis californica</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/17/2004	66.8750	108.1315	8
<i>Sebastes mystinus</i> Adult	8/12/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	9/17/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	8/12/2004	0.2500	0.5000	4
<i>Sebastes serranoides</i> Adult	9/17/2004	0.1250	0.3536	8
<i>Sebastes serranoides</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	8/12/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	9/17/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Adult	8/12/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Adult	9/17/2004	0.2500	0.4629	8
<i>Paralabrax clathratus</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/17/2004	0.1250	0.3536	8
<i>Semicossyphus pulcher</i> Male	8/12/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/17/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	8/12/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	9/17/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	8/12/2004	1.0000	1.4142	4
<i>Embiotoca jacksoni</i> Adult	9/17/2004	2.3750	0.9161	8
<i>Embiotoca jacksoni</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	8/12/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	9/17/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Adult	8/12/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Adult	9/17/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	8/12/2004	0.2500	0.5000	4
<i>Hypsypops rubicundus</i> Adult	9/17/2004	1.0000	0.5345	8
<i>Hypsypops rubicundus</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	8/12/2004	0.2500	0.5000	4
<i>Girella nigricans</i> Adult	9/17/2004	0.7500	0.7071	8
<i>Girella nigricans</i> Juvenile	8/12/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/17/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	8/12/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/17/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	8/12/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/17/2004	0.1250	0.3536	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Cruz Island - Yellow Banks

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/12/2004	4.2500	8.5000	4
<i>Chromis punctipinnis</i> Adult	7/30/2004	0.2500	0.5000	4
<i>Chromis punctipinnis</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/30/2004	0.2500	0.5000	4
<i>Oxyjulis californica</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	7/12/2004	0.5000	0.5774	4
<i>Sebastes atrovirens</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	7/12/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Adult	7/30/2004	0.5000	0.5774	4
<i>Paralabrax clathratus</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/12/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/30/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	7/12/2004	0.7500	0.9574	4
<i>Semicossyphus pulcher</i> Female	7/30/2004	0.5000	0.5774	4
<i>Semicossyphus pulcher</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	7/12/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/12/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/30/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	7/12/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	7/30/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/12/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/30/2004	0.2500	0.5000	4
<i>Halichoeres semicinctus</i> Female	7/12/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	7/30/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)

## Anacapa Island - Admiral's Reef

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	8/9/2004	37.0000	28.8791	4
<i>Chromis punctipinnis</i> Adult	10/1/2004	25.0000	21.2132	4
<i>Chromis punctipinnis</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	10/1/2004	12.5000	25.0000	4
<i>Oxyjulis californica</i> Adult	8/9/2004	3.5000	4.4347	4
<i>Oxyjulis californica</i> Adult	10/1/2004	13.7500	9.4296	4
<i>Oxyjulis californica</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	10/1/2004	21.5000	8.8506	4
<i>Sebastes mystinus</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	10/1/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	10/1/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	10/1/2004	0.2500	0.5000	4
<i>Sebastes atrovirens</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	10/1/2004	0.5000	0.5774	4
<i>Paralabrax clathratus</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	8/9/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	10/1/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	8/9/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	10/1/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Juvenile	8/9/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	10/1/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	10/1/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	8/9/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	10/1/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	8/9/2004	0.2500	0.5000	4
<i>Hypsypops rubicundus</i> Adult	10/1/2004	0.7500	0.9574	4
<i>Hypsypops rubicundus</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	8/9/2004	0.2500	0.5000	4
<i>Girella nigricans</i> Adult	10/1/2004	0.2500	0.5000	4
<i>Girella nigricans</i> Juvenile	8/9/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	10/1/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/9/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	10/1/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	8/9/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	10/1/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
Anacapa Island - Cathedral Cove

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/7/2004	8.5000	12.4499	4
<i>Chromis punctipinnis</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Adult	8/10/2004	25.5000	20.3715	4
<i>Chromis punctipinnis</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	8/10/2004	2.2500	2.2174	4
<i>Oxyjulis californica</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	8/10/2004	10.7500	21.5000	4
<i>Sebastes mystinus</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	8/10/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	6/7/2004	2.5000	2.3805	4
<i>Sebastes serranoides</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	8/10/2004	0.5000	0.5774	4
<i>Sebastes serranoides</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/10/2004	0.5000	1.0000	4
<i>Sebastes atrovirens</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	8/10/2004	0.2500	0.5000	4
<i>Sebastes atrovirens</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	6/7/2004	0.7500	0.5000	4
<i>Paralabrax clathratus</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	8/10/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	6/7/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/16/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	8/10/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	6/7/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	7/16/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	8/10/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	8/10/2004	1.5000	1.7321	4
<i>Embiotoca jacksoni</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	8/10/2004	2.5000	2.3805	4
<i>Embiotoca lateralis</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	8/10/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	8/10/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Anacapa Island - Cathedral Cove

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Damalichthys vacca</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	8/10/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	6/7/2004	0.5000	1.0000	4
<i>Hypsypops rubicundus</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	8/10/2004	0.7500	0.5000	4
<i>Hypsypops rubicundus</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	6/7/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	8/10/2004	2.7500	1.5000	4
<i>Girella nigricans</i> Juvenile	6/7/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	8/10/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	6/7/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/16/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/10/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	6/7/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	7/16/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	8/10/2004	0.2500	0.5000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Anacapa Island - Landing Cove

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	7/16/2004	9.2500	11.9269	4
<i>Chromis punctipinnis</i> Adult	8/11/2004	1.5000	3.0000	4
<i>Chromis punctipinnis</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	7/16/2004	3.7500	1.8930	4
<i>Oxyjulis californica</i> Adult	8/11/2004	1.7500	0.5000	4
<i>Oxyjulis californica</i> Juvenile	7/16/2004	15.0000	13.1403	4
<i>Oxyjulis californica</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	8/11/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	8/11/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	7/16/2004	0.2500	0.5000	4
<i>Sebastes atrovirens</i> Adult	8/11/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	7/16/2004	4.2500	2.8723	4
<i>Paralabrax clathratus</i> Adult	8/11/2004	1.5000	1.2910	4
<i>Paralabrax clathratus</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	7/16/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Male	8/11/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	7/16/2004	0.7500	0.9574	4
<i>Semicossyphus pulcher</i> Female	8/11/2004	1.0000	0.8165	4
<i>Semicossyphus pulcher</i> Juvenile	7/16/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	7/16/2004	1.7500	1.7078	4
<i>Embiotoca jacksoni</i> Adult	8/11/2004	2.0000	2.4495	4
<i>Embiotoca jacksoni</i> Juvenile	7/16/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Juvenile	8/11/2004	1.2500	0.9574	4
<i>Embiotoca lateralis</i> Adult	7/16/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	8/11/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	7/16/2004	0.2500	0.5000	4
<i>Damalichthys vacca</i> Adult	8/11/2004	0.5000	0.5774	4
<i>Damalichthys vacca</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	7/16/2004	1.7500	1.7078	4
<i>Hypsypops rubicundus</i> Adult	8/11/2004	2.0000	2.1602	4
<i>Hypsypops rubicundus</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	7/16/2004	1.2500	1.5000	4
<i>Girella nigricans</i> Adult	8/11/2004	2.7500	3.5940	4
<i>Girella nigricans</i> Juvenile	7/16/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	8/11/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	7/16/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	8/11/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	7/16/2004	0.2500	0.5000	4
<i>Halichoeres semicinctus</i> Female	8/11/2004	0.5000	1.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Barbara Island - SE Sea Lion Rookery

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Adult	9/13/2004	1.2500	1.5811	8
<i>Chromis punctipinnis</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/13/2004	2.2500	2.4928	8
<i>Oxyjulis californica</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/13/2004	13.7500	25.5999	8
<i>Sebastes mystinus</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	9/13/2004	0.1250	0.3536	8
<i>Paralabrax clathratus</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Male	6/9/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/13/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	6/9/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	9/13/2004	0.2500	0.4629	8
<i>Semicossyphus pulcher</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	6/9/2004	0.5000	1.0000	4
<i>Hypsypops rubicundus</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	6/9/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	9/13/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Juvenile	6/9/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/13/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	6/9/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/13/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	6/9/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/13/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Barbara Island - Arch Point

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/8/2004	78.2500	66.2841	4
<i>Chromis punctipinnis</i> Adult	9/14/2004	0.7500	1.5000	4
<i>Chromis punctipinnis</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/14/2004	10.2500	14.1510	4
<i>Oxyjulis californica</i> Adult	6/8/2004	1.5000	3.0000	4
<i>Oxyjulis californica</i> Adult	9/14/2004	3.2500	2.6300	4
<i>Oxyjulis californica</i> Juvenile	6/8/2004	50.0000	100.0000	4
<i>Oxyjulis californica</i> Juvenile	9/14/2004	0.2500	0.5000	4
<i>Sebastes mystinus</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	9/14/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	9/14/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	9/14/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	9/14/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	6/8/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/14/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	6/8/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	9/14/2004	0.5000	1.0000	4
<i>Semicossyphus pulcher</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	9/14/2004	0.2500	0.5000	4
<i>Embiotoca jacksoni</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	9/14/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	6/8/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	9/14/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	6/8/2004	5.0000	3.5590	4
<i>Hypsypops rubicundus</i> Adult	9/14/2004	4.5000	2.0817	4
<i>Hypsypops rubicundus</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	6/8/2004	0.2500	0.5000	4
<i>Girella nigricans</i> Adult	9/14/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	6/8/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/14/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	6/8/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/14/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	6/8/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	9/14/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 Santa Barbara Island - Cat Canyon

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/27/2004	9.2500	12.3119	4
<i>Chromis punctipinnis</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Chromis punctipinnis</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Oxyjulis californica</i> Adult	6/27/2004	3.5000	2.0817	4
<i>Oxyjulis californica</i> Adult	9/14/2004	0.7500	1.4880	8
<i>Oxyjulis californica</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Sebastes mystinus</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Adult	6/27/2004	0.2500	0.5000	4
<i>Sebastes serranoides</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Sebastes serranoides</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Sebastes atrovirens</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Paralabrax clathratus</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Male	6/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	9/14/2004	0.0000	0.0000	8
<i>Semicossyphus pulcher</i> Female	6/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Female	9/14/2004	0.5000	0.5345	8
<i>Semicossyphus pulcher</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Embiotoca jacksoni</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Embiotoca lateralis</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	9/14/2004	0.0000	0.0000	8
<i>Damalichthys vacca</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Hypsypops rubicundus</i> Adult	6/27/2004	0.2500	0.5000	4
<i>Hypsypops rubicundus</i> Adult	9/14/2004	2.0000	3.1168	8
<i>Hypsypops rubicundus</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Girella nigricans</i> Adult	6/27/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	9/14/2004	0.2500	0.4629	8
<i>Girella nigricans</i> Juvenile	6/27/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	9/14/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Male	6/27/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	9/14/2004	0.0000	0.0000	8
<i>Halichoeres semicinctus</i> Female	6/27/2004	0.2500	0.5000	4
<i>Halichoeres semicinctus</i> Female	9/14/2004	0.0000	0.0000	8

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 San Clemente Island - Northwest Harbor

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/24/2004	3.2500	5.8523	4
<i>Chromis punctipinnis</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	6/24/2004	12.2500	10.3722	4
<i>Oxyjulis californica</i> Juvenile	6/24/2004	2.5000	5.0000	4
<i>Sebastes mystinus</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	6/24/2004	0.2500	0.5000	4
<i>Semicossyphus pulcher</i> Female	6/24/2004	1.2500	1.5000	4
<i>Semicossyphus pulcher</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	6/24/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	6/24/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	6/24/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	6/24/2004	0.5000	1.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 San Clemente Island - Boy Scout Camp

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/22/2004	8.5000	13.3041	4
<i>Chromis punctipinnis</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	6/22/2004	5.7500	0.9574	4
<i>Oxyjulis californica</i> Juvenile	6/22/2004	3.2500	4.5735	4
<i>Sebastes mystinus</i> Adult	6/22/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	6/22/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	6/22/2004	0.2500	0.5000	4
<i>Sebastes atrovirens</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	6/22/2004	1.7500	2.0616	4
<i>Paralabrax clathratus</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	6/22/2004	0.5000	0.5774	4
<i>Semicossyphus pulcher</i> Female	6/22/2004	1.7500	1.7078	4
<i>Semicossyphus pulcher</i> Juvenile	6/22/2004	1.2500	0.9574	4
<i>Embiotoca jacksoni</i> Adult	6/22/2004	0.5000	1.0000	4
<i>Embiotoca jacksoni</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	6/22/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	6/22/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	6/22/2004	2.2500	0.9574	4
<i>Hypsypops rubicundus</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	6/22/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	6/22/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	6/22/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	6/22/2004	0.7500	0.9574	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 San Clemente Island - Eel Point

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Chromis punctipinnis</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	6/23/2004	0.2500	0.5000	4
<i>Sebastes serranoides</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	6/23/2004	0.2500	0.5000	4
<i>Paralabrax clathratus</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	6/23/2004	0.5000	0.5774	4
<i>Semicossyphus pulcher</i> Female	6/23/2004	2.0000	1.6330	4
<i>Semicossyphus pulcher</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	6/23/2004	0.7500	1.5000	4
<i>Embiotoca jacksoni</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	6/23/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	6/23/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	6/23/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	6/23/2004	0.0000	0.0000	4

2004 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 M<sup>3</sup>)  
 San Clemente Island - Horse Beach Cove

	<u>Date</u>	<u>Mean</u>	<u>Std. Dev.</u>	<u>n</u>
<i>Chromis punctipinnis</i> Adult	6/25/2004	6.7500	10.9049	4
<i>Chromis punctipinnis</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Oxyjulis californica</i> Adult	6/25/2004	4.0000	2.9439	4
<i>Oxyjulis californica</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Adult	6/25/2004	0.0000	0.0000	4
<i>Sebastes mystinus</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Adult	6/25/2004	0.0000	0.0000	4
<i>Sebastes serranoides</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Sebastes atrovirens</i> Adult	6/25/2004	0.5000	0.5774	4
<i>Sebastes atrovirens</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Paralabrax clathratus</i> Adult	6/25/2004	1.0000	0.8165	4
<i>Paralabrax clathratus</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Semicossyphus pulcher</i> Male	6/25/2004	0.7500	0.5000	4
<i>Semicossyphus pulcher</i> Female	6/25/2004	4.0000	1.6330	4
<i>Semicossyphus pulcher</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Embiotoca jacksoni</i> Adult	6/25/2004	1.5000	1.0000	4
<i>Embiotoca jacksoni</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Adult	6/25/2004	0.0000	0.0000	4
<i>Embiotoca lateralis</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Adult	6/25/2004	0.0000	0.0000	4
<i>Damalichthys vacca</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Hypsypops rubicundus</i> Adult	6/25/2004	3.2500	2.5000	4
<i>Hypsypops rubicundus</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Adult	6/25/2004	0.0000	0.0000	4
<i>Girella nigricans</i> Juvenile	6/25/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Male	6/25/2004	0.0000	0.0000	4
<i>Halichoeres semicinctus</i> Female	6/25/2004	0.2500	0.5000	4

## 2004 ROVING DIVER FISH COUNT:

Island:	Site Name:	Date:	Number of Observers:	Number of species observed:
San Miguel	Wyckoff Ledge	7/28/2004	6	20
San Miguel	Wyckoff Ledge	9/29/2004	5	29
San Miguel	Hare Rock	7/27/2004	4	20
San Miguel	Hare Rock	9/29/2004	5	29
Santa Rosa	Johnson's Lee North	7/29/2004	6	25
Santa Rosa	Johnson's Lee North	8/25/2004	5	32
Santa Rosa	Johnson's Lee South	7/29/2004	6	28
Santa Rosa	Johnson's Lee South	8/24/2004	4	22
Santa Rosa	Rodes Reef	7/26/2004	4	19
Santa Rosa	Rodes Reef	9/27/2004	4	21
Santa Cruz	Gull Island South	7/13/2004	5	23
Santa Cruz	Gull Island South	8/24/2004	4	27
Santa Cruz	Fry's Harbor	7/15/2004	6	29
Santa Cruz	Fry's Harbor	8/27/2004	6	33
Santa Cruz	Pelican Bay	7/14/2004	6	22
Santa Cruz	Pelican Bay	9/30/2004	4	18
Santa Cruz	Scorpion Anchorage	8/12/2004	5	24
Santa Cruz	Scorpion Anchorage	9/17/2004	5	21
Santa Cruz	Yellow Banks	7/12/2004	4	18
Santa Cruz	Yellow Banks	7/30/2004	4	21
Anacapa	Admiral's Reef	8/9/2004	4	18
Anacapa	Admiral's Reef	10/1/2004	4	24
Anacapa	Cathedral Cove	6/7/2004	3	21
Anacapa	Cathedral Cove	8/10/2004	5	26
Anacapa	Landing Cove	7/16/2004	6	25
Anacapa	Landing Cove	8/11/2004	5	26
Santa Barbara	SE Sea Lion Rookery	6/9/2004	5	10
Santa Barbara	SE Sea Lion Rookery	9/13/2004	3	13
Santa Barbara	Arch Point	6/8/2004	6	19
Santa Barbara	Arch Point	9/14/2004	5	19
Santa Barbara	Cat Canyon	6/27/2004	5	21
Santa Barbara	Cat Canyon	9/14/2004	5	21
San Clemente	Northwest Harbor	6/24/2004	5	15
San Clemente	Boy Scout Camp	6/22/2004	4	21
San Clemente	Eel Point	6/23/2004	5	19
San Clemente	Horse Beach Cove	6/25/2004	4	16

2004 ROVING DIVER FISH COUNT:  
San Miguel Island - Wyckoff Ledge

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/28/2004	6	6	9.83	0.41	2.17	0.41	5.50	2.88
black and yellow rockfish	9/29/2004	5	5	8.80	1.64	2.20	0.45	5.80	3.35
black surfperch, adult	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, adult	9/29/2004	5	4	9.25	0.50	1.25	0.50	1.25	0.50
black surfperch, all	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, all	9/29/2004	5	5	9.40	0.55	1.80	0.45	5.60	3.85
black surfperch, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/29/2004	5	4	5.00	3.56	1.50	1.00	3.25	3.40
blackeye goby	7/28/2004	6	6	8.50	1.38	1.83	0.41	3.83	2.79
blackeye goby	9/29/2004	5	5	8.60	0.89	2.60	0.55	14.40	9.15
blacksmith, adult	7/28/2004	6	6	0.83	2.04	0.33	0.82	0.33	0.82
blacksmith, adult	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, all	7/28/2004	6	6	0.83	2.04	0.33	0.82	0.33	0.82
blacksmith, all	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/28/2004	6	6	9.00	0.89	2.33	0.82	7.67	4.80
blue rockfish, adult	9/29/2004	5	4	9.75	0.50	2.75	0.50	22.25	16.74
blue rockfish, all	7/28/2004	6	6	9.00	0.89	2.33	0.82	8.17	5.19
blue rockfish, all	9/29/2004	5	5	9.80	0.45	2.60	0.55	19.40	15.84
blue rockfish, juvenile	7/28/2004	6	6	2.33	3.67	0.50	0.84	0.50	0.84
blue rockfish, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
bocaccio, juvenile	9/29/2004	5	2	10.00	0.00	1.50	0.71	1.50	0.71
cabezon	9/29/2004	5	2	9.00	0.00	1.00	0.00	1.00	0.00
California sheephead, female	7/28/2004	6	6	5.00	4.15	1.17	0.98	1.17	0.98
California sheephead, female	9/29/2004	5	5	9.60	0.55	1.60	0.55	1.60	0.55
California sheephead, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/28/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41
California sheephead, male	9/29/2004	5	5	5.00	4.80	0.60	0.55	0.60	0.55
copper rockfish	7/28/2004	6	5	9.00	1.73	1.80	0.45	2.80	1.10
copper rockfish	9/29/2004	5	5	8.20	1.79	1.80	0.45	3.40	2.07
coralline sculpin	9/29/2004	5	4	5.50	1.00	1.00	0.00	1.00	0.00
garibaldi, adult	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, adult	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	7/28/2004	6	4	8.75	1.50	1.00	0.00	1.00	0.00
gopher rockfish	9/29/2004	5	4	6.50	1.91	1.50	0.58	2.25	1.89
island kelpfish	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, adult	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, adult	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, calico bass, all	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, calico bass, all	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00

## 2004 ROVING DIVER FISH COUNT:

Page: F 3

kelp rockfish, adult	7/28/2004	6	6	8.83	1.83	2.17	0.41	7.33	3.01
kelp rockfish, adult	9/29/2004	5	4	9.75	0.50	2.50	0.58	9.50	4.20
kelp rockfish, all	7/28/2004	6	6	8.83	1.83	2.17	0.41	7.33	3.01
kelp rockfish, all	9/29/2004	5	5	9.80	0.45	2.60	0.55	20.40	14.99
kelp rockfish, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/29/2004	5	4	7.50	2.89	2.50	0.58	14.00	11.34
kelp surfperch	7/28/2004	6	1	5.00		2.00		2.00	
kelp surfperch	9/29/2004	5	4	10.00	0.00	2.50	0.58	18.00	12.52
kelpfish spp.	9/29/2004	5	2	7.00	2.83	1.50	0.71	1.50	0.71
lingcod	7/28/2004	6	5	8.80	1.10	1.40	0.55	1.40	0.55
lingcod	9/29/2004	5	3	6.00	1.73	1.67	0.58	1.67	0.58
olive rockfish, adult	7/28/2004	6	6	1.00	2.45	0.17	0.41	0.17	0.41
olive rockfish, adult	9/29/2004	5	4	8.50	1.29	1.75	0.50	1.75	0.50
olive rockfish, all	7/28/2004	6	6	2.33	3.67	0.50	0.84	1.17	2.40
olive rockfish, all	9/29/2004	5	5	8.80	1.30	1.60	0.55	1.60	0.55
olive/yellowtail rockfish, juvenile	7/28/2004	6	6	1.33	3.27	0.33	0.82	1.00	2.45
olive/yellowtail rockfish, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/28/2004	6	6	9.83	0.41	2.33	0.52	6.67	3.61
painted greenling	9/29/2004	5	5	9.00	0.71	3.00	0.00	21.20	7.89
pile surfperch, adult	7/28/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41
pile surfperch, adult	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	7/28/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41
pile surfperch, all	9/29/2004	5	5	1.60	3.58	0.20	0.45	0.20	0.45
pile surfperch, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	9/29/2004	5	4	2.00	4.00	0.25	0.50	0.25	0.50
rainbow surfperch	9/29/2004	5	4	8.25	0.96	2.00	0.00	4.75	1.71
rock wrasse, female	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rockfish spp., juvenile	9/29/2004	5	1	10.00		2.00		2.00	
rubberlip surfperch	9/29/2004	5	1	7.00		1.00		1.00	
sculpin spp.	9/29/2004	5	1	5.00		1.00		1.00	
senorita, adult	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
senorita, adult	9/29/2004	5	4	2.50	5.00	0.50	1.00	2.25	4.50
senorita, all	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
senorita, all	9/29/2004	5	5	4.00	5.48	0.80	1.10	3.60	4.93
senorita, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
snubnose sculpin	7/28/2004	6	1	8.00		2.00		3.00	
snubnose sculpin	9/29/2004	5	3	9.00	0.00	1.67	0.58	1.67	0.58
speckled sanddab	9/29/2004	5	1	9.00		3.00		12.00	
speckled sanddab	7/28/2004	6	1	9.00		2.00		3.00	
striped surfperch, adult	7/28/2004	6	6	7.67	3.88	1.83	0.98	9.00	10.26
striped surfperch, adult	9/29/2004	5	4	10.00	0.00	2.25	0.50	6.50	5.26
striped surfperch, all	7/28/2004	6	6	7.67	3.88	1.83	0.98	9.17	10.17
striped surfperch, all	9/29/2004	5	5	10.00	0.00	2.80	0.45	14.20	4.44
striped surfperch, juvenile	7/28/2004	6	6	1.17	2.86	0.17	0.41	0.17	0.41
striped surfperch, juvenile	9/29/2004	5	4	9.00	0.82	2.25	0.50	7.50	6.35
top smelt	9/29/2004	5	1	10.00		3.00		100.00	
treefish, adult	7/28/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41

2004 ROVING DIVER FISH COUNT:

treefish, adult	9/29/2004	5	5	5.00	4.80	0.60	0.55	0.60	0.55
treefish, juvenile	7/28/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	9/29/2004	5	5	1.80	4.02	0.20	0.45	0.20	0.45
tubesnout	7/28/2004	6	3	7.00	2.00	3.00	0.00	47.67	18.56
tubesnout	9/29/2004	5	4	10.00	0.00	3.50	0.58	190.50	240.65
vermillion rockfish	7/28/2004	6	2	9.00	1.41	1.00	0.00	1.00	0.00
vermillion rockfish	9/29/2004	5	2	9.00	1.41	1.00	0.00	1.00	0.00

2004 ROVING DIVER FISH COUNT:  
San Miguel Island - Hare Rock

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/27/2004	4	3	7.00	1.73	1.67	0.58	2.67	1.53
black and yellow rockfish	9/29/2004	5	4	7.25	0.96	1.75	0.50	4.25	2.75
black rockfish	9/29/2004	5	1	5.00		1.00		1.00	
black surfperch, adult	7/27/2004	4	4	9.50	0.58	1.25	0.50	1.75	1.50
black surfperch, adult	9/29/2004	5	4	1.75	3.50	0.25	0.50	0.25	0.50
black surfperch, all	7/27/2004	4	4	9.50	0.58	1.25	0.50	1.75	1.50
black surfperch, all	9/29/2004	5	5	4.80	4.55	1.00	1.22	4.80	9.63
black surfperch, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/29/2004	5	4	1.75	3.50	0.25	0.50	0.25	0.50
blackeye goby	7/27/2004	4	4	6.75	4.57	1.50	1.00	4.75	3.40
blackeye goby	9/29/2004	5	5	9.40	0.89	3.00	0.00	20.00	6.12
blacksmith, adult	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, adult	9/29/2004	5	4	6.00	4.08	1.50	1.00	4.25	3.69
blacksmith, all	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, all	9/29/2004	5	5	9.00	1.00	2.60	0.55	13.40	7.70
blacksmith, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/29/2004	5	4	8.75	1.89	2.25	0.50	8.50	5.80
blue rockfish, adult	7/27/2004	4	4	9.75	0.50	3.00	0.00	39.75	22.29
blue rockfish, adult	9/29/2004	5	4	10.00	0.00	3.00	0.00	24.50	7.72
blue rockfish, all	7/27/2004	4	4	9.75	0.50	3.00	0.00	39.75	22.29
blue rockfish, all	9/29/2004	5	5	10.00	0.00	3.00	0.00	26.80	8.44
blue rockfish, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
bocaccio, juvenile	7/27/2004	4	2	9.50	0.71	2.00	0.00	2.00	0.00
cabezon	9/29/2004	5	3	7.67	0.58	1.67	0.58	2.00	1.00
California sheephead, female	7/27/2004	4	4	8.75	1.89	1.25	0.50	1.25	0.50
California sheephead, female	9/29/2004	5	5	9.00	1.22	2.00	0.00	4.60	1.14
California sheephead, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	9/29/2004	5	5	2.60	3.71	0.60	0.89	0.60	0.89
copper rockfish	9/29/2004	5	2	5.50	0.71	1.50	0.71	1.50	0.71
coralline sculpin	9/29/2004	5	2	7.50	3.54	1.50	0.71	2.00	1.41
garibaldi, adult	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, adult	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	9/29/2004	5	1	7.00		1.00		1.00	
gopher/copper rockfish, juvenile	7/27/2004	4	1	6.00		2.00		3.00	
gopher/copper rockfish, juvenile	9/29/2004	5	2	8.50	0.71	2.00	0.00	5.50	4.95
island kelpfish	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
jack mackerel	9/29/2004	5	3	9.67	0.58	3.67	0.58	198.00	148.97
kelp bass, adult	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, adult	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, calico bass, all	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, calico bass, all	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00

## 2004 ROVING DIVER FISH COUNT:

Page: F 6

kelp bass, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	7/27/2004	4	4	9.50	0.58	2.00	0.00	3.75	0.50
kelp rockfish, adult	9/29/2004	5	4	7.25	1.71	2.00	0.00	3.00	1.41
kelp rockfish, all	7/27/2004	4	4	9.50	0.58	2.00	0.00	3.75	0.50
kelp rockfish, all	9/29/2004	5	5	9.40	0.55	2.20	0.45	9.80	3.11
kelp rockfish, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/29/2004	5	4	9.25	0.50	2.25	0.50	6.75	4.65
kelp surfperch	9/29/2004	5	5	9.20	1.79	1.80	0.45	4.60	2.51
kelpfish spp.	9/29/2004	5	1	7.00		1.00		1.00	
lingcod	7/27/2004	4	3	6.33	2.31	1.67	0.58	1.67	0.58
lingcod	9/29/2004	5	4	7.00	0.82	2.00	0.00	2.50	1.00
ocean whitefish	9/29/2004	5	2	7.50	0.71	1.00	0.00	1.00	0.00
olive rockfish, adult	7/27/2004	4	4	7.25	1.71	1.75	0.50	2.75	1.71
olive rockfish, adult	9/29/2004	5	4	8.25	2.36	1.75	0.50	2.50	1.29
olive rockfish, all	7/27/2004	4	4	7.25	1.71	1.75	0.50	3.00	2.16
olive rockfish, all	9/29/2004	5	5	8.60	2.19	1.80	0.45	2.60	1.14
olive/yellowtail rockfish, juvenile	7/27/2004	4	4	2.00	4.00	0.25	0.50	0.25	0.50
olive/yellowtail rockfish, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/29/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/27/2004	4	4	9.00	1.15	2.25	0.50	8.75	2.50
painted greenling	9/29/2004	5	5	9.60	0.89	3.00	0.00	20.20	10.23
pile surfperch, adult	7/27/2004	4	4	6.25	4.27	1.25	0.96	1.25	0.96
pile surfperch, adult	9/29/2004	5	4	4.50	5.26	1.00	1.15	1.50	1.73
pile surfperch, all	7/27/2004	4	4	6.25	4.27	1.25	0.96	1.25	0.96
pile surfperch, all	9/29/2004	5	5	6.60	3.97	1.20	0.84	1.60	1.34
pile surfperch, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	9/29/2004	5	4	2.25	4.50	0.25	0.50	0.25	0.50
rainbow surfperch	7/27/2004	4	1	8.00		1.00		1.00	
rainbow surfperch	9/29/2004	5	3	10.00	0.00	1.00	0.00	1.00	0.00
rock wrasse, female	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rubberlip surfperch	9/29/2004	5	1	6.00		2.00		2.00	
senorita, adult	7/27/2004	4	4	3.75	4.79	1.75	2.06	42.50	56.79
senorita, adult	9/29/2004	5	4	8.75	2.50	3.75	0.50	207.00	153.23
senorita, all	7/27/2004	4	4	5.75	4.35	2.00	1.83	42.75	56.54
senorita, all	9/29/2004	5	5	10.00	0.00	4.00	0.00	303.20	132.48
senorita, juvenile	7/27/2004	4	4	2.00	4.00	0.25	0.50	0.25	0.50
senorita, juvenile	9/29/2004	5	4	10.00	0.00	3.75	0.50	133.50	94.89
snubnose sculpin	7/27/2004	4	1	10.00		2.00		2.00	
snubnose sculpin	9/29/2004	5	4	6.75	1.26	2.00	0.82	5.75	5.50
striped surfperch, adult	7/27/2004	4	4	9.75	0.50	3.00	0.00	18.00	4.08
striped surfperch, adult	9/29/2004	5	4	9.75	0.50	2.50	0.58	10.00	2.94
striped surfperch, all	7/27/2004	4	4	10.00	0.00	3.00	0.00	25.50	5.97
striped surfperch, all	9/29/2004	5	5	10.00	0.00	2.60	0.55	16.20	6.53
striped surfperch, juvenile	7/27/2004	4	4	9.50	0.58	2.00	0.00	7.50	2.65
striped surfperch, juvenile	9/29/2004	5	4	8.75	1.26	2.25	0.50	6.50	4.65
stripedfin ronquil	7/27/2004	4	2	8.50	2.12	1.50	0.71	1.50	0.71
top smelt	9/29/2004	5	4	10.00	0.00	3.25	0.50	53.00	65.16
treefish, adult	7/27/2004	4	4	1.25	2.50	0.25	0.50	0.25	0.50

2004 ROVING DIVER FISH COUNT:

treefish, adult	9/29/2004	5	5	2.40	3.36	0.60	0.89	0.60	0.89
treefish, juvenile	7/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	9/29/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
tubesnout	7/27/2004	4	4	9.00	0.82	3.75	0.50	167.50	101.12
tubesnout	9/29/2004	5	5	10.00	0.00	3.60	0.55	162.40	149.13

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/29/2004	6	5	6.80	0.84	1.60	0.55	2.40	1.34
black and yellow rockfish	8/25/2004	5	5	8.00	2.74	1.80	0.45	4.40	2.88
black surfperch, adult	7/29/2004	6	6	9.83	0.41	2.83	0.41	12.83	3.31
black surfperch, adult	8/25/2004	5	4	9.75	0.50	2.50	0.58	9.00	3.65
black surfperch, all	7/29/2004	6	6	9.83	0.41	2.83	0.41	13.33	4.03
black surfperch, all	8/25/2004	5	5	9.60	0.55	2.40	0.55	9.00	3.39
black surfperch, juvenile	7/29/2004	6	6	1.00	2.45	0.33	0.82	0.50	1.22
black surfperch, juvenile	8/25/2004	5	4	1.50	3.00	0.25	0.50	0.25	0.50
blackeye goby	7/29/2004	6	6	9.00	0.89	1.83	0.75	4.17	4.49
blackeye goby	8/25/2004	5	5	9.20	1.30	2.40	0.55	15.60	12.30
blacksmith, adult	7/29/2004	6	6	10.00	0.00	3.17	0.41	54.00	31.70
blacksmith, adult	8/25/2004	5	4	10.00	0.00	3.00	0.00	37.50	10.54
blacksmith, all	7/29/2004	6	6	10.00	0.00	3.17	0.41	54.00	31.70
blacksmith, all	8/25/2004	5	5	10.00	0.00	3.00	0.00	38.40	9.34
blacksmith, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/29/2004	6	6	9.67	0.52	2.67	0.52	16.17	8.82
blue rockfish, adult	8/25/2004	5	4	9.25	0.96	2.00	0.00	5.25	2.50
blue rockfish, all	7/29/2004	6	6	9.67	0.52	2.67	0.52	16.33	8.57
blue rockfish, all	8/25/2004	5	5	9.00	1.00	2.00	0.00	5.20	2.17
blue rockfish, juvenile	7/29/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41
blue rockfish, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
bocaccio, juvenile	8/25/2004	5	4	7.00	0.82	1.50	0.58	2.50	1.73
California sheephead, female	7/29/2004	6	6	10.00	0.00	3.00	0.00	16.33	6.22
California sheephead, female	8/25/2004	5	5	10.00	0.00	2.00	0.00	4.80	1.48
California sheephead, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/29/2004	6	6	9.50	0.84	2.00	0.00	4.33	2.25
California sheephead, male	8/25/2004	5	5	3.20	4.44	0.40	0.55	0.40	0.55
copper rockfish	8/25/2004	5	3	5.33	0.58	1.00	0.00	1.00	0.00
coralline sculpin	8/25/2004	5	1	5.00		1.00		1.00	
fringehead spp.	8/25/2004	5	1	6.00		1.00		1.00	
garibaldi, adult	7/29/2004	6	6	8.83	1.17	2.00	0.00	4.00	1.67
garibaldi, adult	8/25/2004	5	5	9.20	0.45	2.00	0.00	2.60	1.34
garibaldi, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish	8/25/2004	5	2	7.50	0.71	1.00	0.00	1.00	0.00
gopher rockfish	8/25/2004	5	2	6.00	0.00	2.00	0.00	2.50	0.71
gopher/copper rockfish, juvenile	7/29/2004	6	2	7.50	2.12	1.50	0.71	1.50	0.71
gopher/copper rockfish, juvenile	8/25/2004	5	2	6.50	0.71	2.00	0.00	2.00	0.00
island kelpfish	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
jack mackerel	7/29/2004	6	3	9.33	1.15	3.33	0.58	141.67	137.69
kelp bass, adult	7/29/2004	6	6	3.33	5.16	0.50	0.84	0.67	1.21
kelp bass, adult	8/25/2004	5	4	2.25	4.50	0.25	0.50	0.25	0.50
kelp bass, calico bass, all	7/29/2004	6	6	3.33	5.16	0.50	0.84	0.67	1.21
kelp bass, calico bass, all	8/25/2004	5	5	1.80	4.02	0.20	0.45	0.20	0.45

## 2004 ROVING DIVER FISH COUNT:

Page: F 9

kelp bass, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	7/29/2004	6	6	10.00	0.00	2.67	0.52	19.17	12.83	
kelp rockfish, adult	8/25/2004	5	4	9.00	1.41	2.75	0.50	18.50	13.33	
kelp rockfish, all	7/29/2004	6	6	10.00	0.00	2.67	0.52	19.33	13.06	
kelp rockfish, all	8/25/2004	5	5	9.00	1.22	2.80	0.45	18.20	11.56	
kelp rockfish, juvenile	7/29/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41	
kelp rockfish, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00	
kelp surfperch	7/29/2004	6	4	8.75	1.89	2.75	0.50	17.50	11.82	
kelp surfperch	8/25/2004	5	5	9.60	0.55	2.80	0.45	23.80	18.38	
kelpfish spp.	8/25/2004	5	1	6.00		1.00		1.00		
lingcod	8/25/2004	5	3	9.33	0.58	1.00	0.00	1.00	0.00	
olive rockfish, adult	7/29/2004	6	6	10.00	0.00	3.00	0.00	17.00	7.92	
olive rockfish, adult	8/25/2004	5	4	9.25	0.96	1.75	0.50	3.00	2.16	
olive rockfish, all	7/29/2004	6	6	10.00	0.00	3.00	0.00	17.33	8.12	
olive rockfish, all	8/25/2004	5	5	9.00	1.00	1.80	0.45	2.80	1.92	
olive/yellowtail rockfish, juvenile	7/29/2004	6	6	3.00	4.69	0.33	0.52	0.33	0.52	
olive/yellowtail rockfish, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00	
opaleye, adult	7/29/2004	6	6	5.33	3.20	1.17	0.75	1.17	0.75	
opaleye, adult	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00	
opaleye, all	7/29/2004	6	6	5.33	3.20	1.17	0.75	1.17	0.75	
opaleye, all	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00	
opaleye, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00	
opaleye, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00	
Pacific sardine	8/25/2004	5	2	8.00	0.00	4.00	0.00	2000.00	1414.21	
painted greenling	7/29/2004	6	6	9.83	0.41	2.83	0.41	17.50	6.12	
painted greenling	8/25/2004	5	5	10.00	0.00	2.80	0.45	18.80	10.35	
pile surfperch, adult	7/29/2004	6	6	9.33	0.52	2.33	0.52	9.67	5.72	
pile surfperch, adult	8/25/2004	5	4	9.25	0.96	2.00	0.00	7.00	2.16	
pile surfperch, all	7/29/2004	6	6	9.33	0.52	2.33	0.52	9.67	5.72	
pile surfperch, all	8/25/2004	5	5	9.20	0.84	2.00	0.00	6.40	2.30	
pile surfperch, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00	
pile surfperch, juvenile	8/25/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00	
rainbow surfperch	8/25/2004	5	2	8.00	1.41	2.00	0.00	5.00	4.24	
rock wrasse, female	7/29/2004	6	6	1.17	2.86	0.17	0.41	0.17	0.41	
rock wrasse, female	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00	
rock wrasse, male	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00	
rock wrasse, male	8/25/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00	
rubberlip surfperch	7/29/2004	6	2	9.00	0.00	2.00	0.00	4.00	2.83	
rubberlip surfperch	8/25/2004	5	1	6.00		1.00		1.00		
scalyhead sculpin	8/25/2004	5	1	7.00		1.00		1.00		
sculpin spp.	8/25/2004	5	2	9.00	0.00	2.50	0.71	7.50	7.78	
senorita, adult	7/29/2004	6	6	10.00	0.00	3.00	0.00	45.17	23.89	
senorita, adult	8/25/2004	5	5	9.60	0.55	3.00	0.00	16.75	4.57	
senorita, all	7/29/2004	6	6	10.00	0.00	3.00	0.00	48.83	24.18	
senorita, all	8/25/2004	5	5	9.80	0.45	3.40	0.55	122.80	69.54	
senorita, juvenile	7/29/2004	6	6	4.83	5.31	1.17	1.33	3.67	5.47	
senorita, juvenile	8/25/2004	5	5	8.80	1.30	3.20	0.45	100.50	80.31	
snubnose sculpin	7/29/2004	6	1	8.00		1.00		1.00		
snubnose sculpin	8/25/2004	5	1	5.00		2.00		2.00		
striped surfperch, adult	7/29/2004	6	6	10.00	0.00	3.00	0.00	38.50	11.08	
striped surfperch, adult	8/25/2004	5	4	10.00	0.00	3.00	0.00	18.75	4.72	
striped surfperch, all	7/29/2004	6	6	10.00	0.00	3.00	0.00	39.00	11.38	
striped surfperch, all	8/25/2004	5	5	10.00	0.00	3.00	0.00	20.40	3.51	
striped surfperch, juvenile	7/29/2004	6	6	2.00	3.16	0.50	0.84	0.50	0.84	
striped surfperch, juvenile	8/25/2004	5	4	8.00	2.31	1.75	0.50	2.00	0.82	
swell shark	7/29/2004	6	2	6.50	0.71	1.00	0.00	1.00	0.00	

2004 ROVING DIVER FISH COUNT:

top smelt	7/29/2004	6	4	7.50	2.89	2.75	0.50	30.25	14.64
top smelt	8/25/2004	5	4	9.75	0.50	3.00	0.82	64.25	75.91
treefish, adult	7/29/2004	6	6	3.67	4.08	0.67	0.82	1.00	1.55
treefish, adult	8/25/2004	5	5	5.40	3.36	1.20	0.84	1.60	1.52
treefish, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	8/25/2004	5	5	4.20	4.02	1.00	1.00	1.40	1.67

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/29/2004	6	6	9.33	0.52	1.83	0.41	5.67	2.66
black and yellow rockfish	8/24/2004	4	4	8.00	0.82	2.00	0.00	4.00	2.16
black surfperch, adult	7/29/2004	6	6	9.67	0.52	2.17	0.41	8.00	4.20
black surfperch, adult	8/24/2004	4	3	9.67	0.58	2.00	0.00	8.67	1.53
black surfperch, all	7/29/2004	6	6	9.67	0.52	2.17	0.41	8.00	4.20
black surfperch, all	8/24/2004	4	4	9.75	0.50	2.25	0.50	13.00	8.12
black surfperch, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	8/24/2004	4	3	3.00	5.20	0.33	0.58	0.33	0.58
blackeye goby	7/29/2004	6	6	9.67	0.52	2.67	0.52	14.67	10.78
blackeye goby	8/24/2004	4	4	9.25	0.50	3.00	0.00	17.00	5.29
blacksmith, adult	7/29/2004	6	6	9.83	0.41	3.00	0.00	26.33	4.08
blacksmith, adult	8/24/2004	4	3	10.00	0.00	3.00	0.00	25.00	3.61
blacksmith, all	7/29/2004	6	6	9.83	0.41	3.00	0.00	26.33	4.08
blacksmith, all	8/24/2004	4	4	10.00	0.00	3.00	0.00	26.75	4.57
blacksmith, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/29/2004	6	6	10.00	0.00	2.83	0.41	16.33	6.50
blue rockfish, adult	8/24/2004	4	3	9.67	0.58	3.00	0.00	17.00	5.57
blue rockfish, all	7/29/2004	6	6	10.00	0.00	2.83	0.41	16.33	6.50
blue rockfish, all	8/24/2004	4	4	9.50	0.58	3.00	0.00	17.50	4.65
blue rockfish, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
cabezon	7/29/2004	6	2	7.50	0.71	1.00	0.00	1.00	0.00
California sheephead, female	7/29/2004	6	6	9.83	0.41	2.33	0.52	11.00	7.24
California sheephead, female	8/24/2004	4	4	10.00	0.00	2.00	0.00	6.25	1.71
California sheephead, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/29/2004	6	6	9.17	0.41	1.50	0.55	2.17	1.47
California sheephead, male	8/24/2004	4	4	2.50	5.00	0.25	0.50	0.25	0.50
coralline sculpin	7/29/2004	6	1	6.00		1.00		1.00	
garibaldi, adult	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, adult	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	7/29/2004	6	2	9.00	0.00	1.50	0.71	2.50	2.12
gopher rockfish	8/24/2004	4	3	8.00	1.00	1.67	0.58	2.00	1.00
gopher/copper rockfish, juvenile	7/29/2004	6	1	9.00		1.00		1.00	
island kelpfish	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
jack mackerel	7/29/2004	6	2	5.00	0.00	3.50	0.71	175.00	141.42
kelp bass, adult	7/29/2004	6	6	8.83	0.98	1.67	0.52	3.00	1.67
kelp bass, adult	8/24/2004	4	3	8.67	2.31	2.00	0.00	4.67	2.08
kelp bass, calico bass, all	7/29/2004	6	6	8.83	0.98	1.67	0.52	3.00	1.67
kelp bass, calico bass, all	8/24/2004	4	4	8.75	1.89	1.75	0.50	3.75	2.50
kelp bass, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	7/29/2004	6	6	9.67	0.52	2.83	0.41	15.50	5.13

## 2004 ROVING DIVER FISH COUNT:

Page: F 12

kelp rockfish, adult	8/24/2004	4	3	9.00	1.00	2.67	0.58	18.67	10.02
kelp rockfish, all	7/29/2004	6	6	9.67	0.52	2.83	0.41	15.83	5.67
kelp rockfish, all	8/24/2004	4	4	9.00	0.82	2.75	0.50	17.25	9.29
kelp rockfish, juvenile	7/29/2004	6	6	1.17	2.86	0.33	0.82	0.33	0.82
kelp rockfish, juvenile	8/24/2004	4	3	3.00	5.20	0.33	0.58	0.33	0.58
kelp surfperch	7/29/2004	6	3	8.33	1.53	2.00	1.00	8.00	8.89
kelp surfperch	8/24/2004	4	2	9.50	0.71	2.50	0.71	7.50	4.95
lingcod	7/29/2004	6	3	9.00	1.73	1.00	0.00	1.00	0.00
ocean whitefish	7/29/2004	6	6	9.67	0.52	1.83	0.41	3.17	1.60
ocean whitefish	8/24/2004	4	4	8.50	1.73	1.50	0.58	1.75	0.96
olive rockfish, adult	7/29/2004	6	6	8.83	1.94	1.83	0.41	3.83	2.48
olive rockfish, adult	8/24/2004	4	3	9.67	0.58	2.33	0.58	9.33	1.53
olive rockfish, all	7/29/2004	6	6	8.83	1.94	1.83	0.41	3.83	2.48
olive rockfish, all	8/24/2004	4	4	9.50	0.58	2.25	0.50	9.00	1.41
olive/yellowtail rockfish, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/29/2004	6	6	3.17	4.92	0.67	1.03	2.17	3.37
opaleye, adult	8/24/2004	4	3	6.67	5.77	1.33	1.15	2.00	2.00
opaleye, all	7/29/2004	6	6	3.17	4.92	0.67	1.03	2.17	3.37
opaleye, all	8/24/2004	4	4	7.50	5.00	1.50	1.00	2.00	1.63
opaleye, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/29/2004	6	6	10.00	0.00	3.00	0.00	26.67	9.35
painted greenling	8/24/2004	4	4	9.75	0.50	3.00	0.00	18.25	5.56
pile surfperch, adult	7/29/2004	6	6	9.67	0.82	2.67	0.52	10.00	3.41
pile surfperch, adult	8/24/2004	4	3	8.33	1.53	1.67	0.58	5.00	3.46
pile surfperch, all	7/29/2004	6	6	9.67	0.82	2.67	0.52	10.00	3.41
pile surfperch, all	8/24/2004	4	4	8.25	1.26	1.75	0.50	4.75	2.87
pile surfperch, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
rainbow surfperch	7/29/2004	6	5	9.60	0.89	2.40	0.55	19.00	17.18
rainbow surfperch	8/24/2004	4	3	8.00	0.00	1.00	0.00	1.00	0.00
rock wrasse, female	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rubberlip surfperch	7/29/2004	6	2	8.00	1.41	1.50	0.71	1.50	0.71
rubberlip surfperch	8/24/2004	4	2	9.50	0.71	2.00	0.00	2.50	0.71
sculpin spp.	8/24/2004	4	1	6.00		1.00		1.00	
senorita, adult	7/29/2004	6	6	10.00	0.00	3.67	0.52	107.83	43.99
senorita, adult	8/24/2004	4	3	10.00	0.00	3.00	0.00	70.00	18.19
senorita, all	7/29/2004	6	6	10.00	0.00	3.67	0.52	107.83	43.99
senorita, all	8/24/2004	4	4	10.00	0.00	3.00	0.00	63.75	19.41
senorita, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	8/24/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
snubnose sculpin	7/29/2004	6	3	6.00	0.00	1.67	0.58	1.67	0.58
striped surfperch, adult	7/29/2004	6	6	10.00	0.00	3.00	0.00	27.83	7.31
striped surfperch, adult	8/24/2004	4	3	10.00	0.00	3.00	0.00	23.00	10.44
striped surfperch, all	7/29/2004	6	6	10.00	0.00	3.00	0.00	27.83	7.31
striped surfperch, all	8/24/2004	4	4	10.00	0.00	3.00	0.00	30.00	14.90
striped surfperch, juvenile	7/29/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	8/24/2004	4	3	5.67	5.13	1.00	1.00	1.33	1.53
top smelt	7/29/2004	6	4	7.75	2.63	2.75	0.50	38.50	41.78
top smelt	8/24/2004	4	4	10.00	0.00	3.25	0.50	87.50	52.04
treefish, adult	7/29/2004	6	6	3.00	4.65	0.33	0.52	0.33	0.52
treefish, adult	8/24/2004	4	4	1.75	3.50	0.25	0.50	0.25	0.50
treefish, juvenile	7/29/2004	6	6	4.17	4.58	0.83	0.98	1.00	1.26

2004 ROVING DIVER FISH COUNT:

treefish, juvenile	8/24/2004	4	4	3.00	3.56	0.50	0.58	0.50	0.58
white surfperch	7/29/2004	6	3	8.00	1.73	2.00	1.00	8.33	6.66

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/26/2004	4	2	8.00	2.83	1.00	0.00	1.00	0.00
black and yellow rockfish	9/27/2004	4	2	7.00	0.00	1.00	0.00	1.00	0.00
black surfperch, adult	7/26/2004	4	4	10.00	0.00	2.25	0.50	6.25	5.85
black surfperch, adult	9/27/2004	4	3	9.67	0.58	2.00	0.00	8.00	1.00
black surfperch, all	7/26/2004	4	4	10.00	0.00	2.25	0.50	6.25	5.85
black surfperch, all	9/27/2004	4	4	9.75	0.50	2.50	0.58	10.75	1.50
black surfperch, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/27/2004	4	3	6.00	5.29	1.33	1.15	3.00	2.65
blackeye goby	7/26/2004	4	4	1.75	3.50	0.50	1.00	1.00	2.00
blackeye goby	9/27/2004	4	4	8.00	2.16	1.50	0.58	1.50	0.58
blacksmith, adult	7/26/2004	4	4	9.75	0.50	2.00	1.15	10.25	11.30
blacksmith, adult	9/27/2004	4	3	9.00	1.00	2.00	0.00	6.33	0.58
blacksmith, all	7/26/2004	4	4	9.75	0.50	2.00	1.15	10.25	11.30
blacksmith, all	9/27/2004	4	4	9.00	0.82	2.00	0.00	5.25	2.22
blacksmith, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/26/2004	4	4	10.00	0.00	3.00	0.00	37.75	8.10
blue rockfish, adult	9/27/2004	4	3	9.33	0.58	3.00	0.00	27.00	8.19
blue rockfish, all	7/26/2004	4	4	10.00	0.00	3.00	0.00	37.75	8.10
blue rockfish, all	9/27/2004	4	4	9.50	0.58	3.00	0.00	28.75	7.54
blue rockfish, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California scorpionfish	9/27/2004	4	1	6.00		1.00		1.00	
California sheephead, female	7/26/2004	4	4	3.75	4.79	0.75	0.96	0.75	0.96
California sheephead, female	9/27/2004	4	4	8.75	0.50	2.00	0.00	3.50	1.91
California sheephead, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	9/27/2004	4	4	9.50	0.58	1.50	0.58	2.00	1.15
copper rockfish	7/26/2004	4	3	6.67	2.89	1.33	0.58	1.67	1.15
coralline sculpin	7/26/2004	4	1	9.00		1.00		1.00	
garibaldi, adult	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, adult	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish	9/27/2004	4	1	10.00		1.00		1.00	
giant kelpfish, juvenile	9/27/2004	4	1	5.00		2.00		2.00	
island kelpfish	7/26/2004	4	4	2.50	5.00	0.25	0.50	0.25	0.50
island kelpfish	9/27/2004	4	4	1.25	2.50	0.25	0.50	0.25	0.50
kelp bass, adult	7/26/2004	4	4	1.25	2.50	0.25	0.50	0.25	0.50
kelp bass, adult	9/27/2004	4	3	3.00	5.20	0.67	1.15	0.67	1.15
kelp bass, calico bass, all	7/26/2004	4	4	1.25	2.50	0.25	0.50	0.25	0.50
kelp bass, calico bass, all	9/27/2004	4	4	2.25	4.50	0.50	1.00	0.50	1.00
kelp bass, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	7/26/2004	4	4	8.75	2.50	2.00	0.00	4.25	2.63
kelp rockfish, adult	9/27/2004	4	3	8.67	1.53	2.00	0.00	6.67	3.21

## 2004 ROVING DIVER FISH COUNT:

Page: F 15

kelp rockfish, all	7/26/2004	4	4	8.75	2.50	2.00	0.00	4.25	2.63
kelp rockfish, all	9/27/2004	4	4	9.00	1.41	2.50	0.58	9.25	4.27
kelp rockfish, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/27/2004	4	3	4.00	3.46	1.00	1.00	1.00	1.00
kelp surfperch	7/26/2004	4	1	5.00		3.00		13.00	
kelp surfperch	9/27/2004	4	3	7.33	2.52	2.33	0.58	9.33	7.77
olive rockfish, adult	7/26/2004	4	4	1.50	3.00	0.25	0.50	0.25	0.50
olive rockfish, adult	9/27/2004	4	3	5.00	4.36	1.00	1.00	1.00	1.00
olive rockfish, all	7/26/2004	4	4	1.50	3.00	0.25	0.50	0.25	0.50
olive rockfish, all	9/27/2004	4	4	6.25	4.35	1.25	0.96	1.50	1.29
olive/yellowtail rockfish, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/26/2004	4	4	10.00	0.00	3.00	0.00	21.75	4.57
painted greenling	9/27/2004	4	4	10.00	0.00	3.00	0.00	29.50	11.90
pile surfperch, adult	7/26/2004	4	4	5.00	5.77	1.00	1.15	1.00	1.15
pile surfperch, adult	9/27/2004	4	3	9.00	1.00	1.67	0.58	3.00	1.73
pile surfperch, all	7/26/2004	4	4	7.50	5.00	2.00	1.41	8.25	8.42
pile surfperch, all	9/27/2004	4	4	9.25	0.96	2.00	0.82	5.25	4.72
pile surfperch, juvenile	7/26/2004	4	4	5.00	5.77	1.50	1.73	7.25	8.46
pile surfperch, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rubberlip surfperch	7/26/2004	4	1	9.00		1.00		1.00	
rubberlip surfperch	9/27/2004	4	4	7.75	1.26	2.00	0.00	2.75	0.96
sculpin spp.	7/26/2004	4	1	7.00		1.00		1.00	
senorita, adult	7/26/2004	4	4	3.00	3.56	1.00	1.15	1.75	2.06
senorita, adult	9/27/2004	4	3	9.67	0.58	3.00	0.00	28.33	15.04
senorita, all	7/26/2004	4	4	3.00	3.56	1.00	1.15	1.75	2.06
senorita, all	9/27/2004	4	4	9.75	0.50	3.00	0.00	38.25	23.33
senorita, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	9/27/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
snubnose sculpin	9/27/2004	4	2	7.00	0.00	1.00	0.00	1.00	0.00
striped surfperch, adult	7/26/2004	4	4	3.75	4.79	1.25	1.50	3.50	5.74
striped surfperch, adult	9/27/2004	4	3	10.00	0.00	3.00	0.00	22.33	14.47
striped surfperch, all	7/26/2004	4	4	6.25	4.79	2.00	1.41	7.25	7.37
striped surfperch, all	9/27/2004	4	4	10.00	0.00	3.00	0.00	27.75	11.53
striped surfperch, juvenile	7/26/2004	4	4	4.50	5.26	1.25	1.50	3.75	5.68
striped surfperch, juvenile	9/27/2004	4	3	10.00	0.00	2.00	0.00	4.67	3.06
top smelt	9/27/2004	4	3	9.00	1.00	3.33	0.58	91.67	62.92
treefish, adult	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	7/26/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	9/27/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
yellowfin fringehead	9/27/2004	4	2	6.00	0.00	1.00	0.00	1.00	0.00

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/13/2004	5	3	7.67	2.52	1.67	0.58	2.67	1.53
black and yellow rockfish	8/24/2004	4	3	8.67	1.15	1.67	0.58	3.67	3.79
black surfperch, adult	7/13/2004	5	3	8.67	0.58	1.67	0.58	2.67	2.08
black surfperch, adult	8/24/2004	4	4	8.25	2.06	1.75	0.50	4.00	2.94
black surfperch, all	7/13/2004	5	5	8.20	1.30	1.60	0.55	3.40	2.88
black surfperch, all	8/24/2004	4	4	8.25	2.06	2.00	0.82	6.50	4.93
black surfperch, juvenile	7/13/2004	5	3	3.00	5.20	0.67	1.15	0.67	1.15
black surfperch, juvenile	8/24/2004	4	4	4.50	5.26	1.00	1.15	2.25	2.63
blackeye goby	7/13/2004	5	5	9.40	0.89	2.60	0.55	13.25	11.59
blackeye goby	8/24/2004	4	4	10.00	0.00	3.00	0.00	33.25	18.39
blacksmith, adult	7/13/2004	5	3	10.00	0.00	3.00	1.00	15.50	17.68
blacksmith, adult	8/24/2004	4	4	10.00	0.00	3.00	0.00	57.50	22.58
blacksmith, all	7/13/2004	5	5	9.80	0.45	2.60	0.89	11.50	11.39
blacksmith, all	8/24/2004	4	4	10.00	0.00	3.00	0.00	57.50	22.58
blacksmith, juvenile	7/13/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/13/2004	5	3	9.33	1.15	3.33	0.58	18.00	9.90
blue rockfish, adult	8/24/2004	4	4	10.00	0.00	2.75	0.50	17.25	9.54
blue rockfish, all	7/13/2004	5	5	9.60	0.89	3.20	0.45	32.25	8.50
blue rockfish, all	8/24/2004	4	4	10.00	0.00	2.75	0.50	17.75	9.98
blue rockfish, juvenile	7/13/2004	5	3	4.67	4.16	1.33	1.53	4.67	7.23
blue rockfish, juvenile	8/24/2004	4	4	1.75	3.50	0.50	1.00	0.50	1.00
blue-banded goby	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
cabezon	7/13/2004	5	2	5.50	0.71	1.00	0.00	1.00	0.00
California sheephead, female	7/13/2004	5	5	9.80	0.45	2.20	0.45	8.00	2.12
California sheephead, female	8/24/2004	4	4	9.75	0.50	2.00	0.00	5.00	2.16
California sheephead, juvenile	7/13/2004	5	5	1.20	2.68	0.20	0.45	0.20	0.45
California sheephead, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/13/2004	5	5	6.40	3.78	1.40	0.89	1.80	1.48
California sheephead, male	8/24/2004	4	4	3.50	4.36	0.50	0.58	0.50	0.58
copper rockfish	7/13/2004	5	3	8.67	0.58	1.67	0.58	2.33	1.53
copper rockfish	8/24/2004	4	2	7.00	1.41	1.00	0.00	1.00	0.00
coralline sculpin	8/24/2004	4	1	7.00		2.00		2.00	
garibaldi, adult	7/13/2004	5	5	3.60	4.93	0.40	0.55	0.40	0.55
garibaldi, adult	8/24/2004	4	4	1.25	2.50	0.25	0.50	0.25	0.50
garibaldi, juvenile	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish, juvenile	8/24/2004	4	1	5.00		2.00		3.00	
gopher rockfish	7/13/2004	5	3	7.67	2.31	1.67	0.58	2.67	1.53
gopher rockfish	8/24/2004	4	4	9.25	0.96	1.50	0.58	2.00	1.41
gopher/copper rockfish, juvenile	8/24/2004	4	3	6.33	1.53	1.33	0.58	1.33	0.58
island kelpfish	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, adult	7/13/2004	5	3	5.00	4.58	0.67	0.58	0.67	0.58
kelp bass, adult	8/24/2004	4	4	2.50	2.89	0.50	0.58	0.50	0.58
kelp bass, calico bass, all	7/13/2004	5	5	4.60	4.34	0.60	0.55	0.60	0.55
kelp bass, calico bass, all	8/24/2004	4	4	2.50	2.89	0.50	0.58	0.50	0.58
kelp bass, juvenile	7/13/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00

## 2004 ROVING DIVER FISH COUNT:

Page: F 17

kelp bass, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	7/13/2004	5	3	9.00	1.00	2.33	0.58	10.33	6.66
kelp rockfish, adult	8/24/2004	4	4	8.25	2.06	2.25	0.50	8.50	4.20
kelp rockfish, all	7/13/2004	5	5	9.40	0.89	2.20	0.45	9.80	7.79
kelp rockfish, all	8/24/2004	4	4	9.00	1.41	2.75	0.50	10.25	4.27
kelp rockfish, juvenile	7/13/2004	5	3	3.33	5.77	0.67	1.15	1.67	2.89
kelp rockfish, juvenile	8/24/2004	4	4	5.00	3.74	1.25	0.96	1.75	1.50
kelp surfperch	7/13/2004	5	5	9.20	1.10	2.40	0.89	16.75	21.93
kelp surfperch	8/24/2004	4	4	9.75	0.50	3.25	0.50	68.50	51.80
lingcod	7/13/2004	5	3	5.33	0.58	1.00	0.00	1.00	0.00
lingcod	8/24/2004	4	1	10.00		2.00		2.00	
olive rockfish, adult	7/13/2004	5	3	9.67	0.58	2.33	0.58	6.00	1.41
olive rockfish, adult	8/24/2004	4	4	6.00	4.24	1.50	1.00	2.25	2.06
olive rockfish, all	7/13/2004	5	5	9.60	0.55	2.20	0.45	6.75	2.36
olive rockfish, all	8/24/2004	4	4	7.50	1.73	1.75	0.50	3.00	2.16
olive/yellowtail rockfish, juvenile	7/13/2004	5	3	3.33	5.77	0.67	1.15	0.00	0.00
olive/yellowtail rockfish, juvenile	8/24/2004	4	4	5.00	3.37	0.75	0.50	0.75	0.50
opaleye, adult	7/13/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	8/24/2004	4	4	4.25	4.92	0.50	0.58	0.50	0.58
opaleye, all	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	8/24/2004	4	4	4.25	4.92	0.50	0.58	0.50	0.58
opaleye, juvenile	7/13/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/13/2004	5	5	9.60	0.55	3.00	0.00	45.50	12.58
painted greenling	8/24/2004	4	4	10.00	0.00	3.00	0.00	49.75	28.77
pile surfperch, adult	7/13/2004	5	3	9.33	1.15	2.00	0.00	3.00	1.00
pile surfperch, adult	8/24/2004	4	4	7.50	1.73	1.25	0.50	1.50	1.00
pile surfperch, all	7/13/2004	5	5	8.80	1.10	2.00	0.00	3.40	1.67
pile surfperch, all	8/24/2004	4	4	8.25	2.22	2.00	0.00	3.50	1.29
pile surfperch, juvenile	7/13/2004	5	3	3.33	5.77	0.67	1.15	0.67	1.15
pile surfperch, juvenile	8/24/2004	4	4	8.25	2.22	1.75	0.50	2.00	0.82
rainbow surfperch	7/13/2004	5	1	8.00		1.00		1.00	
rainbow surfperch	8/24/2004	4	2	8.50	0.71	1.50	0.71	3.50	3.54
rock wrasse, female	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
sculpin spp.	8/24/2004	4	1	7.00		1.00		1.00	
senorita, adult	7/13/2004	5	3	10.00	0.00	2.67	0.58	9.00	8.49
senorita, adult	8/24/2004	4	4	8.75	1.89	2.25	0.50	10.00	6.78
senorita, all	7/13/2004	5	5	10.00	0.00	2.60	0.55	8.00	6.48
senorita, all	8/24/2004	4	4	8.75	1.89	2.25	0.50	10.00	6.78
senorita, juvenile	7/13/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	8/24/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
snubnose sculpin	8/24/2004	4	2	6.50	0.71	2.00	0.00	2.50	0.71
striped surfperch, adult	7/13/2004	5	3	3.00	5.20	0.67	1.15	1.67	2.89
striped surfperch, adult	8/24/2004	4	4	5.50	4.04	1.25	0.96	2.50	2.38
striped surfperch, all	7/13/2004	5	5	6.60	3.78	1.60	0.89	4.00	3.08
striped surfperch, all	8/24/2004	4	4	8.50	0.58	1.75	0.50	4.25	2.50
striped surfperch, juvenile	7/13/2004	5	4	6.00	4.08	1.50	1.00	3.33	4.16
striped surfperch, juvenile	8/24/2004	4	4	4.25	4.92	1.00	1.15	1.75	2.36
treefish, adult	7/13/2004	5	5	2.20	3.03	0.40	0.55	0.40	0.55
treefish, adult	8/24/2004	4	4	6.25	4.35	1.25	0.96	1.25	0.96
treefish, juvenile	7/13/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	8/24/2004	4	4	4.25	4.92	0.75	0.96	1.00	1.41
white surfperch	7/13/2004	5	1	10.00		1.00		1.00	

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
bat ray	7/15/2004	6	1	9.00		1.00		1.00	
black and yellow rockfish	7/15/2004	6	4	5.00	0.00	1.00	0.00	1.00	0.00
black and yellow rockfish	8/27/2004	6	1	10.00		1.00		1.00	
black surfperch, adult	7/15/2004	6	5	1.60	3.58	0.40	0.89	0.40	0.89
black surfperch, adult	8/27/2004	6	5	2.00	4.47	0.20	0.45	0.20	0.45
black surfperch, all	7/15/2004	6	6	1.33	3.27	0.33	0.82	0.33	0.82
black surfperch, all	8/27/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41
black surfperch, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	7/15/2004	6	6	10.00	0.00	3.67	0.52	111.75	79.74
blackeye goby	8/27/2004	6	6	10.00	0.00	3.50	0.55	133.40	79.13
blacksmith, adult	7/15/2004	6	5	9.60	0.89	3.80	0.45	280.50	116.51
blacksmith, adult	8/27/2004	6	5	10.00	0.00	3.80	0.45	150.00	55.85
blacksmith, all	7/15/2004	6	6	9.50	0.84	3.67	0.52	238.40	138.00
blacksmith, all	8/27/2004	6	6	10.00	0.00	3.67	0.52	130.83	68.55
blacksmith, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/15/2004	6	6	2.00	3.10	0.33	0.52	0.40	0.55
blue rockfish, adult	8/27/2004	6	5	4.00	3.67	0.80	0.84	1.20	1.64
blue rockfish, all	7/15/2004	6	6	7.00	3.63	1.67	0.82	6.50	3.73
blue rockfish, all	8/27/2004	6	6	8.00	0.89	2.00	0.00	4.33	1.75
blue rockfish, juvenile	7/15/2004	6	6	7.00	3.63	1.67	0.82	6.40	3.91
blue rockfish, juvenile	8/27/2004	6	5	8.00	1.00	2.00	0.00	3.20	1.10
blue-banded goby	7/15/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/27/2004	6	6	1.17	2.86	0.17	0.41	0.17	0.41
cabezon	8/27/2004	6	1	10.00		1.00		1.00	
California moray	8/27/2004	6	1	9.00		1.00		1.00	
California scorpionfish	7/15/2004	6	1	9.00		1.00		1.00	
California scorpionfish	8/27/2004	6	1	10.00		1.00		1.00	
California sheephead, female	7/15/2004	6	6	9.33	1.21	1.83	0.41	3.50	1.64
California sheephead, female	8/27/2004	6	6	9.33	1.03	2.00	0.00	3.00	1.26
California sheephead, juvenile	7/15/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41
California sheephead, juvenile	8/27/2004	6	6	5.00	5.48	0.50	0.55	0.50	0.55
California sheephead, male	7/15/2004	6	6	1.17	2.86	0.17	0.41	0.17	0.41
California sheephead, male	8/27/2004	6	6	6.00	3.03	0.83	0.41	0.83	0.41
copper rockfish	7/15/2004	6	2	7.50	2.12	1.00	0.00	1.00	0.00
copper rockfish	8/27/2004	6	2	7.50	0.71	1.50	0.71	1.50	0.71
garibaldi, adult	7/15/2004	6	6	7.67	1.37	2.00	0.00	4.00	1.41
garibaldi, adult	8/27/2004	6	6	9.33	0.82	2.00	0.00	4.33	1.75
garibaldi, juvenile	7/15/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	8/27/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	7/15/2004	6	3	9.33	0.58	2.00	0.00	3.33	0.58
gopher rockfish	8/27/2004	6	5	8.20	1.79	1.20	0.45	1.40	0.89
gopher/copper rockfish, juvenile	8/27/2004	6	1	8.00		1.00		1.00	
halfmoon	7/15/2004	6	1	5.00		1.00		1.00	
halfmoon	8/27/2004	6	4	6.50	1.00	1.75	0.50	2.75	1.26
island kelpfish	7/15/2004	6	6	8.33	1.86	1.33	0.52	1.50	0.84
island kelpfish	8/27/2004	6	6	9.33	0.82	2.17	0.41	6.17	3.43
kelp bass, adult	7/15/2004	6	5	7.80	4.38	1.60	0.89	3.80	2.77

## 2004 ROVING DIVER FISH COUNT:

Page: F 19

kelp bass, adult	8/27/2004	6	5	9.60	0.89	2.40	0.55	8.40	2.51
kelp bass, calico bass, all	7/15/2004	6	6	8.17	4.02	1.67	0.82	3.50	2.59
kelp bass, calico bass, all	8/27/2004	6	6	9.67	0.82	2.33	0.52	8.50	2.07
kelp bass, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	8/27/2004	6	5	2.00	4.47	0.20	0.45	0.20	0.45
kelp rockfish, adult	7/15/2004	6	5	3.60	3.36	1.00	1.00	1.40	1.67
kelp rockfish, adult	8/27/2004	6	5	7.00	1.22	1.80	0.45	2.20	1.10
kelp rockfish, all	7/15/2004	6	6	4.33	3.50	1.00	0.89	1.33	1.51
kelp rockfish, all	8/27/2004	6	6	7.00	1.10	1.83	0.41	2.17	0.98
kelp rockfish, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
lingcod	7/15/2004	6	2	5.50	0.71	1.00	0.00	1.00	0.00
northern ronquil	8/27/2004	6	1	6.00		1.00		1.00	
ocean whitefish	7/15/2004	6	3	8.33	2.89	1.00	0.00	1.00	0.00
ocean whitefish	8/27/2004	6	4	9.25	0.96	2.00	0.00	4.00	1.83
olive rockfish, adult	7/15/2004	6	5	7.00	4.47	1.40	0.89	2.60	2.07
olive rockfish, adult	8/27/2004	6	5	5.40	5.08	1.20	1.10	1.40	1.34
olive rockfish, all	7/15/2004	6	6	7.17	4.02	1.50	0.84	2.50	1.87
olive rockfish, all	8/27/2004	6	6	5.83	4.67	1.17	0.98	1.33	1.21
olive/yellowtail rockfish, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/15/2004	6	5	2.40	3.36	0.60	0.89	0.80	1.30
opaleye, adult	8/27/2004	6	5	7.80	1.48	1.80	0.45	3.00	1.58
opaleye, all	7/15/2004	6	6	2.00	3.16	0.50	0.84	0.67	1.21
opaleye, all	8/27/2004	6	6	7.83	1.33	1.83	0.41	3.00	1.41
opaleye, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/15/2004	6	6	10.00	0.00	3.17	0.41	33.20	13.37
painted greenling	8/27/2004	6	6	10.00	0.00	3.00	0.00	41.33	13.85
pile surfperch, adult	7/15/2004	6	5	9.80	0.45	2.80	0.45	12.25	1.71
pile surfperch, adult	8/27/2004	6	5	9.40	0.89	2.00	0.00	7.20	1.92
pile surfperch, all	7/15/2004	6	6	9.83	0.41	2.83	0.41	11.00	3.54
pile surfperch, all	8/27/2004	6	6	9.50	0.84	2.17	0.41	8.50	3.62
pile surfperch, juvenile	7/15/2004	6	5	1.60	3.58	0.20	0.45	0.20	0.45
pile surfperch, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	7/15/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41
rock wrasse, female	8/27/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	7/15/2004	6	6	2.00	3.16	0.33	0.52	0.33	0.52
rock wrasse, male	8/27/2004	6	6	2.00	3.16	0.50	0.84	0.50	0.84
rubberlip surfperch	7/15/2004	6	5	7.20	0.84	1.80	0.45	2.20	0.84
rubberlip surfperch	8/27/2004	6	4	9.00	0.82	1.50	0.58	1.50	0.58
scalyhead sculpin	8/27/2004	6	1	6.00		1.00		1.00	
sculpin spp.	8/27/2004	6	1	6.00		1.00		1.00	
senorita, adult	7/15/2004	6	5	7.60	4.28	1.60	0.89	2.00	1.41
senorita, adult	8/27/2004	6	5	9.00	0.71	2.00	0.00	5.00	2.92
senorita, all	7/15/2004	6	6	9.33	0.82	1.83	0.41	2.83	1.83
senorita, all	8/27/2004	6	6	9.17	0.75	2.00	0.00	4.67	2.73
senorita, juvenile	7/15/2004	6	5	1.60	3.58	0.20	0.45	0.20	0.45
senorita, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
snubnose sculpin	7/15/2004	6	2	5.00	0.00	2.00	0.00	2.00	0.00
snubnose sculpin	8/27/2004	6	1	10.00		2.00		3.00	
striped surfperch, adult	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	7/15/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	8/27/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	7/15/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	8/27/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00

2004 ROVING DIVER FISH COUNT:

stripedfin ronquil	7/15/2004	6	3	9.00	1.00	2.00	0.00	3.00	1.00
stripedfin ronquil	8/27/2004	6	3	7.00	2.65	1.67	0.58	2.00	1.00
treefish, adult	7/15/2004	6	6	9.83	0.41	2.17	0.41	7.17	3.31
treefish, adult	8/27/2004	6	6	9.17	0.41	2.00	0.00	6.33	2.58
treefish, juvenile	7/15/2004	6	6	5.33	4.23	0.83	0.75	1.50	2.26
treefish, juvenile	8/27/2004	6	6	7.67	3.78	1.50	0.84	2.50	1.87
white surfperch	7/15/2004	6	3	6.67	0.58	1.67	0.58	3.00	2.00
zebra goby	7/15/2004	6	1	7.00		2.00		2.00	
zebra goby	8/27/2004	6	1	7.00		1.00		1.00	

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
bat ray	7/14/2004	6	2	9.00	0.00	1.00	0.00	1.00	0.00
black croaker	7/14/2004	6	1	7.00		1.00		1.00	
black surfperch, adult	7/14/2004	6	5	10.00	0.00	3.00	0.00	14.00	2.94
black surfperch, adult	9/30/2004	4	4	10.00	0.00	3.00	0.00	25.00	8.83
black surfperch, all	7/14/2004	6	6	10.00	0.00	3.00	0.00	13.80	2.59
black surfperch, all	9/30/2004	4	4	10.00	0.00	3.00	0.00	27.00	10.55
black surfperch, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/30/2004	4	4	6.75	4.57	1.25	0.96	2.00	1.83
blackeye goby	7/14/2004	6	6	10.00	0.00	3.83	0.41	217.00	142.76
blackeye goby	9/30/2004	4	4	10.00	0.00	4.00	0.00	356.67	115.04
blacksmith, adult	7/14/2004	6	5	9.60	0.89	3.00	0.71	18.50	15.93
blacksmith, adult	9/30/2004	4	4	9.75	0.50	3.50	0.58	113.25	101.57
blacksmith, all	7/14/2004	6	6	9.67	0.82	3.00	0.63	24.40	19.09
blacksmith, all	9/30/2004	4	4	10.00	0.00	3.50	0.58	202.25	127.25
blacksmith, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/30/2004	4	4	9.75	0.50	3.25	0.50	89.00	32.20
blue rockfish, adult	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/14/2004	6	6	1.33	3.27	0.17	0.41	0.20	0.45
blue-banded goby	9/30/2004	4	4	3.50	4.12	0.50	0.58	0.50	0.58
cabezon	7/14/2004	6	1	6.00		1.00		1.00	
California sheephead, female	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, female	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
c-o turbot	7/14/2004	6	2	6.00	0.00	1.00	0.00	1.00	0.00
garibaldi, adult	7/14/2004	6	6	10.00	0.00	2.33	0.52	10.00	2.92
garibaldi, adult	9/30/2004	4	4	10.00	0.00	3.00	0.00	14.75	2.22
garibaldi, juvenile	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
halfmoon	9/30/2004	4	2	9.00	1.41	1.00	0.00	1.00	0.00
island kelpfish	7/14/2004	6	6	1.00	2.45	0.17	0.41	0.20	0.45
island kelpfish	9/30/2004	4	4	6.75	4.72	1.75	1.26	6.00	5.89
kelp bass, adult	7/14/2004	6	5	9.60	0.89	2.20	0.45	8.25	2.22
kelp bass, adult	9/30/2004	4	4	9.75	0.50	3.00	0.00	28.50	4.80
kelp bass, calico bass, all	7/14/2004	6	6	9.67	0.82	2.33	0.52	8.80	2.28
kelp bass, calico bass, all	9/30/2004	4	4	10.00	0.00	3.00	0.00	52.50	7.23
kelp bass, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/30/2004	4	4	10.00	0.00	3.00	0.00	24.00	4.00
kelp rockfish, adult	7/14/2004	6	5	5.40	4.93	1.00	1.00	0.75	0.96
kelp rockfish, adult	9/30/2004	4	4	5.00	5.77	0.75	0.96	1.25	1.89
kelp rockfish, all	7/14/2004	6	6	6.17	4.79	1.00	0.89	0.80	0.84
kelp rockfish, all	9/30/2004	4	4	5.00	5.77	0.75	0.96	1.25	1.89

## 2004 ROVING DIVER FISH COUNT:

Page: F 22

kelp rockfish, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, adult	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, adult	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/14/2004	6	5	3.60	4.93	0.60	0.89	0.25	0.50
opaleye, adult	9/30/2004	4	4	7.25	0.96	1.50	0.58	1.50	0.58
opaleye, all	7/14/2004	6	6	3.00	4.65	0.50	0.84	0.20	0.45
opaleye, all	9/30/2004	4	4	7.25	0.96	1.50	0.58	1.50	0.58
opaleye, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/14/2004	6	6	9.17	0.98	2.00	0.00	5.20	0.84
painted greenling	9/30/2004	4	4	7.00	4.76	1.50	1.00	2.25	1.50
pile surfperch, adult	7/14/2004	6	5	6.80	4.32	1.80	1.10	1.75	1.26
pile surfperch, adult	9/30/2004	4	4	10.00	0.00	2.50	0.58	10.00	2.94
pile surfperch, all	7/14/2004	6	6	7.33	4.08	1.83	0.98	2.40	1.82
pile surfperch, all	9/30/2004	4	4	10.00	0.00	2.50	0.58	10.00	2.94
pile surfperch, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	9/30/2004	4	4	9.25	0.96	1.00	0.00	1.00	0.00
rock wrasse, juvenile	9/30/2004	4	2	9.00	0.00	1.50	0.71	1.50	0.71
rock wrasse, male	7/14/2004	6	6	1.50	3.67	0.17	0.41	0.00	0.00
rock wrasse, male	9/30/2004	4	4	2.00	4.00	0.25	0.50	0.25	0.50
rubberlip surfperch	7/14/2004	6	3	9.00	1.00	1.67	0.58	1.67	0.58
rubberlip surfperch	9/30/2004	4	3	9.33	0.58	2.00	0.00	4.33	1.15
sculpin spp.	7/14/2004	6	2	6.00	1.41	1.00	0.00	1.00	0.00
senorita, adult	7/14/2004	6	5	2.80	4.09	0.40	0.55	0.25	0.50
senorita, adult	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.25	0.50
senorita, all	7/14/2004	6	6	3.83	4.45	0.67	0.82	0.60	0.89
senorita, all	9/30/2004	4	4	7.25	1.26	2.00	0.82	12.00	6.73
senorita, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	9/30/2004	4	4	7.25	1.26	2.25	0.50	11.75	6.95
striped surfperch, adult	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	9/30/2004	4	4	1.25	2.50	0.50	1.00	1.50	3.00
striped surfperch, all	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	7/14/2004	6	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	9/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
swell shark	7/14/2004	6	2	9.00	1.41	1.00	0.00	1.00	0.00
treefish, adult	7/14/2004	6	6	2.83	3.19	0.67	0.82	0.80	0.84
treefish, adult	9/30/2004	4	4	6.25	4.35	1.50	1.00	1.75	1.26
treefish, juvenile	7/14/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	9/30/2004	4	4	2.00	4.00	0.25	0.50	0.25	0.50
yellowfin fringehead	7/14/2004	6	2	9.00	1.41	2.00	0.00	4.00	2.83
yellowfin fringehead	9/30/2004	4	1	7.00		2.00		5.00	

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	8/12/2004	5	1	9.00		2.00		3.00	
black and yellow rockfish	9/17/2004	5	2	9.00	0.00	1.50	0.71	1.50	0.71
black surfperch, adult	8/12/2004	5	5	10.00	0.00	3.00	0.00	15.00	3.54
black surfperch, adult	9/17/2004	5	5	9.40	0.55	2.80	0.45	14.80	7.69
black surfperch, all	8/12/2004	5	5	10.00	0.00	3.00	0.00	15.00	3.54
black surfperch, all	9/17/2004	5	5	9.60	0.55	3.00	0.00	20.00	9.72
black surfperch, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/17/2004	5	5	9.20	1.10	2.00	0.00	5.20	2.59
blackeye goby	8/12/2004	5	5	10.00	0.00	4.00	0.00	219.00	73.26
blackeye goby	9/17/2004	5	5	10.00	0.00	4.00	0.00	196.50	108.75
blacksmith, adult	8/12/2004	5	5	8.80	1.79	3.00	0.00	66.00	21.60
blacksmith, adult	9/17/2004	5	5	10.00	0.00	2.40	0.55	14.80	9.88
blacksmith, all	8/12/2004	5	5	8.80	1.79	3.00	0.00	66.00	21.60
blacksmith, all	9/17/2004	5	5	10.00	0.00	3.20	0.84	92.00	71.24
blacksmith, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/17/2004	5	5	8.20	1.30	3.20	0.84	77.20	65.99
blue rockfish, adult	8/12/2004	5	5	3.60	3.51	0.60	0.55	0.60	0.55
blue rockfish, adult	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	8/12/2004	5	5	3.60	3.51	0.60	0.55	0.60	0.55
blue rockfish, all	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California scorpionfish	9/17/2004	5	1	6.00		1.00		1.00	
California sheephead, female	8/12/2004	5	5	8.40	1.52	1.40	0.55	1.40	0.55
California sheephead, female	9/17/2004	5	5	1.00	2.24	0.20	0.45	0.20	0.45
California sheephead, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
coralline sculpin	8/12/2004	5	1	9.00		1.00		1.00	
coralline sculpin	9/17/2004	5	1	9.00		1.00		1.00	
garibaldi, adult	8/12/2004	5	5	10.00	0.00	2.00	0.00	6.60	1.95
garibaldi, adult	9/17/2004	5	5	9.40	0.89	2.00	0.00	8.00	2.92
garibaldi, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	9/17/2004	5	1	9.00		1.00		1.00	
gopher/copper rockfish, juvenile	8/12/2004	5	1	7.00		1.00		1.00	
halfmoon	8/12/2004	5	1	7.00		2.00		2.00	
horn shark	8/12/2004	5	1	9.00		1.00		1.00	
horn shark	9/17/2004	5	5	8.20	1.30	1.80	0.45	2.00	0.71
island kelpfish	8/12/2004	5	5	4.40	4.28	0.60	0.55	0.60	0.55
island kelpfish	9/17/2004	5	5	8.80	1.10	1.60	0.55	4.00	3.67
kelp bass, adult	8/12/2004	5	5	7.80	1.92	1.60	0.55	2.80	2.17
kelp bass, adult	9/17/2004	5	5	9.00	1.00	2.00	0.00	4.80	3.03
kelp bass, calico bass, all	8/12/2004	5	5	7.80	1.92	1.60	0.55	2.80	2.17
kelp bass, calico bass, all	9/17/2004	5	5	9.20	0.84	2.20	0.45	7.00	3.16
kelp bass, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00

## 2004 ROVING DIVER FISH COUNT:

Page: F 24

kelp bass, juvenile	9/17/2004	5	5	9.00	0.71	1.60	0.55	2.20	1.10
kelp rockfish, adult	8/12/2004	5	5	3.20	4.38	0.80	1.10	1.20	1.79
kelp rockfish, adult	9/17/2004	5	5	3.80	3.63	1.00	1.00	1.40	1.67
kelp rockfish, all	8/12/2004	5	5	3.20	4.38	0.80	1.10	1.20	1.79
kelp rockfish, all	9/17/2004	5	5	3.80	3.63	1.00	1.00	1.40	1.67
kelp rockfish, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, adult	8/12/2004	5	5	4.00	5.48	0.40	0.55	0.40	0.55
olive rockfish, adult	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	8/12/2004	5	5	4.00	5.48	0.40	0.55	0.40	0.55
olive rockfish, all	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	8/12/2004	5	5	8.60	1.34	1.80	0.45	2.80	1.30
opaleye, adult	9/17/2004	5	5	8.60	1.52	2.20	0.45	10.20	3.96
opaleye, all	8/12/2004	5	5	8.60	1.34	1.80	0.45	2.80	1.30
opaleye, all	9/17/2004	5	5	8.60	1.52	2.20	0.45	10.20	3.96
opaleye, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
Pacific sardine	9/17/2004	5	1	5.00		4.00		500.00	
painted greenling	8/12/2004	5	5	10.00	0.00	3.00	0.00	15.60	3.85
painted greenling	9/17/2004	5	5	9.60	0.55	2.20	0.45	7.60	2.07
pile surfperch, adult	8/12/2004	5	5	9.60	0.89	2.00	0.00	4.00	1.41
pile surfperch, adult	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	8/12/2004	5	5	9.60	0.89	2.00	0.00	4.00	1.41
pile surfperch, all	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	8/12/2004	5	5	3.20	4.60	0.40	0.55	0.40	0.55
rock wrasse, female	9/17/2004	5	5	5.80	0.45	1.20	0.45	1.20	0.45
rock wrasse, male	8/12/2004	5	5	1.40	3.13	0.20	0.45	0.20	0.45
rock wrasse, male	9/17/2004	5	5	1.40	3.13	0.20	0.45	0.20	0.45
rubberlip surfperch	8/12/2004	5	1	6.00		1.00		1.00	
senorita, adult	8/12/2004	5	5	10.00	0.00	3.00	0.00	29.20	23.59
senorita, adult	9/17/2004	5	5	10.00	0.00	3.00	0.00	24.80	10.43
senorita, all	8/12/2004	5	5	10.00	0.00	3.00	0.00	29.40	23.46
senorita, all	9/17/2004	5	5	10.00	0.00	4.00	0.00	238.60	65.41
senorita, juvenile	8/12/2004	5	5	2.00	4.47	0.20	0.45	0.20	0.45
senorita, juvenile	9/17/2004	5	5	10.00	0.00	4.00	0.00	213.80	60.20
snubnose sculpin	9/17/2004	5	1	7.00		1.00		1.00	
striped surfperch, adult	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
swell shark	8/12/2004	5	1	8.00		1.00		1.00	
treefish, adult	8/12/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	9/17/2004	5	5	1.80	4.02	0.40	0.89	0.40	0.89
treefish, juvenile	8/12/2004	5	5	1.80	4.02	0.40	0.89	0.40	0.89
treefish, juvenile	9/17/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
yellowfin fringehead	8/12/2004	5	1	8.00		1.00		1.00	
yellowfin fringehead	9/17/2004	5	2	8.00	1.41	1.50	0.71	1.50	0.71

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	7/30/2004	4	1	8.00		1.00		1.00	
black surfperch, adult	7/12/2004	4	3	2.67	4.62	0.67	1.15	1.00	1.73
black surfperch, adult	7/30/2004	4	4	3.50	4.12	0.50	0.58	0.50	0.58
black surfperch, all	7/12/2004	4	4	4.25	4.92	1.00	1.15	1.50	1.91
black surfperch, all	7/30/2004	4	4	3.50	4.12	0.50	0.58	0.50	0.58
black surfperch, juvenile	7/12/2004	4	3	2.67	4.62	0.33	0.58	0.33	0.58
black surfperch, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	7/12/2004	4	4	9.75	0.50	2.50	0.58	14.00	11.27
blackeye goby	7/30/2004	4	4	10.00	0.00	3.00	0.00	30.00	12.73
blacksmith, adult	7/12/2004	4	3	4.67	4.51	1.67	1.53	5.33	7.57
blacksmith, adult	7/30/2004	4	4	6.75	4.72	1.25	0.96	1.25	0.96
blacksmith, all	7/12/2004	4	4	5.25	3.86	1.75	1.26	4.50	6.40
blacksmith, all	7/30/2004	4	4	6.75	4.72	1.25	0.96	1.25	0.96
blacksmith, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, female	7/12/2004	4	4	9.50	0.58	2.25	0.50	7.50	3.70
California sheephead, female	7/30/2004	4	4	9.50	1.00	2.00	0.00	4.50	0.58
California sheephead, juvenile	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
copper rockfish	7/12/2004	4	4	7.00	2.31	1.50	0.58	1.75	0.96
copper rockfish	7/30/2004	4	1	6.00		1.00		1.00	
garibaldi, adult	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, adult	7/30/2004	4	4	2.50	2.89	0.50	0.58	0.50	0.58
garibaldi, juvenile	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
gopher/copper rockfish, juvenile	7/30/2004	4	2	7.00	2.83	1.00	0.00	1.00	0.00
island kelpfish	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	7/30/2004	4	4	2.00	4.00	0.25	0.50	0.25	0.50
jack mackerel	7/30/2004	4	2	10.00	0.00	3.00	0.00	30.00	0.00
kelp bass, adult	7/12/2004	4	3	8.33	1.53	1.67	0.58	2.33	1.15
kelp bass, adult	7/30/2004	4	4	9.50	0.58	2.00	0.00	3.25	1.50
kelp bass, calico bass, all	7/12/2004	4	4	8.25	1.26	1.75	0.50	2.25	0.96
kelp bass, calico bass, all	7/30/2004	4	4	9.50	0.58	2.00	0.00	3.25	1.50
kelp bass, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	7/12/2004	4	3	3.33	2.89	0.67	0.58	0.67	0.58
kelp rockfish, adult	7/30/2004	4	4	3.50	4.12	0.75	0.96	0.75	0.96
kelp rockfish, all	7/12/2004	4	4	3.75	2.50	1.00	0.82	1.00	0.82
kelp rockfish, all	7/30/2004	4	4	3.50	4.12	0.75	0.96	0.75	0.96

## 2004 ROVING DIVER FISH COUNT:

Page: F 26

kelp rockfish, juvenile	7/12/2004	4	3	1.67	2.89	0.33	0.58	0.33	0.58
kelp rockfish, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp surfperch	7/12/2004	4	3	8.33	2.89	2.00	0.00	3.00	1.00
kelp surfperch	7/30/2004	4	4	8.25	2.36	3.50	0.58	85.00	55.29
olive rockfish, adult	7/12/2004	4	3	8.00	2.65	1.67	0.58	2.00	1.00
olive rockfish, adult	7/30/2004	4	4	2.25	4.50	0.25	0.50	0.25	0.50
olive rockfish, all	7/12/2004	4	4	8.00	2.16	2.00	0.00	3.50	2.38
olive rockfish, all	7/30/2004	4	4	2.25	4.50	0.25	0.50	0.25	0.50
olive/yellowtail rockfish, juvenile	7/12/2004	4	3	3.00	5.20	0.33	0.58	0.33	0.58
olive/yellowtail rockfish, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	7/12/2004	4	4	10.00	0.00	3.00	0.00	17.75	5.68
painted greenling	7/30/2004	4	4	9.75	0.50	2.75	0.50	19.75	9.00
pile surfperch, adult	7/12/2004	4	3	2.67	4.62	0.33	0.58	0.33	0.58
pile surfperch, adult	7/30/2004	4	4	3.75	4.35	0.75	0.96	1.00	1.41
pile surfperch, all	7/12/2004	4	4	4.00	4.62	0.75	0.96	0.75	0.96
pile surfperch, all	7/30/2004	4	4	3.75	4.35	0.75	0.96	1.00	1.41
pile surfperch, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rainbow surfperch	7/12/2004	4	3	7.00	1.00	1.33	0.58	1.67	1.15
rock wrasse, female	7/12/2004	4	4	5.25	3.59	1.00	0.82	1.00	0.82
rock wrasse, female	7/30/2004	4	4	4.25	2.99	1.25	0.96	1.25	0.96
rock wrasse, male	7/12/2004	4	4	5.50	3.70	1.00	0.82	1.00	0.82
rock wrasse, male	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
senorita, adult	7/12/2004	4	3	10.00	0.00	3.00	0.00	14.50	3.54
senorita, adult	7/30/2004	4	4	9.50	1.00	2.50	0.58	16.00	13.88
senorita, all	7/12/2004	4	4	10.00	0.00	3.00	0.00	21.33	12.10
senorita, all	7/30/2004	4	4	9.50	1.00	2.50	0.58	16.00	13.88
senorita, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	7/12/2004	4	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
swell shark	7/12/2004	4	1	8.00		1.00		1.00	
reef fish, adult	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
reef fish, adult	7/30/2004	4	4	3.50	4.04	0.50	0.58	0.50	0.58
reef fish, juvenile	7/12/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
reef fish, juvenile	7/30/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
tubenout	7/30/2004	4	1	6.00		3.00		37.00	
vermillion rockfish, juvenile	7/12/2004	4	2	5.50	0.71	1.00	0.00	1.00	0.00
vermillion rockfish, juvenile	7/30/2004	4	4	8.75	0.50	1.00	0.00	1.00	0.00
white surfperch	7/12/2004	4	1	5.00		1.00		1.00	

## Anacapa Island - Admiral's Reef

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
bat ray	8/9/2004	4	1	6.00		2.00		2.00	
black surfperch, adult	8/9/2004	4	4	8.75	1.26	2.00	0.82	7.00	4.55
black surfperch, adult	10/1/2004	4	4	9.75	0.50	2.25	0.50	7.00	4.08
black surfperch, all	8/9/2004	4	4	8.75	1.26	2.00	0.82	7.00	4.55
black surfperch, all	10/1/2004	4	4	9.75	0.50	2.25	0.50	7.00	4.08
black surfperch, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	8/9/2004	4	4	10.00	0.00	4.00	0.00	181.33	94.64
blackeye goby	10/1/2004	4	4	10.00	0.00	4.00	0.00	144.33	10.07
blacksmith, adult	8/9/2004	4	4	10.00	0.00	4.00	0.00	676.75	156.62
blacksmith, adult	10/1/2004	4	4	10.00	0.00	3.25	0.50	102.75	74.72
blacksmith, all	8/9/2004	4	4	10.00	0.00	4.00	0.00	677.00	156.88
blacksmith, all	10/1/2004	4	4	10.00	0.00	4.00	0.00	179.00	29.34
blacksmith, juvenile	8/9/2004	4	4	1.50	3.00	0.25	0.50	0.25	0.50
blacksmith, juvenile	10/1/2004	4	4	10.00	0.00	3.00	0.82	76.25	62.14
blue rockfish, adult	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	10/1/2004	4	4	1.25	2.50	0.50	1.00	0.50	1.00
blue rockfish, all	8/9/2004	4	4	4.00	4.90	0.50	0.58	0.50	0.58
blue rockfish, all	10/1/2004	4	4	1.25	2.50	0.50	1.00	0.50	1.00
blue rockfish, juvenile	8/9/2004	4	4	4.00	4.90	0.50	0.58	0.50	0.58
blue rockfish, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California moray	10/1/2004	4	2	7.00	2.83	1.00	0.00	1.00	0.00
California scorpionfish	8/9/2004	4	1	9.00		1.00		1.00	
California scorpionfish	10/1/2004	4	2	6.50	0.71	1.50	0.71	2.50	2.12
California sheephead, female	8/9/2004	4	4	9.50	0.58	2.00	0.82	5.50	4.12
California sheephead, female	10/1/2004	4	4	10.00	0.00	2.50	0.58	10.00	5.23
California sheephead, juvenile	8/9/2004	4	4	4.50	3.11	1.25	0.96	2.00	1.83
California sheephead, juvenile	10/1/2004	4	4	7.50	5.00	1.00	0.82	1.00	0.82
California sheephead, male	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, adult	8/9/2004	4	4	9.50	1.00	2.50	0.58	8.75	3.77
garibaldi, adult	10/1/2004	4	4	10.00	0.00	2.25	0.50	9.00	1.63
garibaldi, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	10/1/2004	4	1	9.00		1.00		1.00	
halfmoon	8/9/2004	4	4	9.75	0.50	2.00	0.00	3.00	0.00
halfmoon	10/1/2004	4	4	10.00	0.00	2.25	0.50	10.25	3.86
island kelpfish	8/9/2004	4	4	9.25	0.96	2.00	0.82	4.75	4.50
island kelpfish	10/1/2004	4	4	8.75	1.50	2.00	0.00	5.00	2.94
kelp bass, adult	8/9/2004	4	4	7.00	0.82	1.50	0.58	2.00	1.41
kelp bass, adult	10/1/2004	4	4	8.00	0.82	2.00	0.00	3.50	1.73
kelp bass, calico bass, all	8/9/2004	4	4	7.00	0.82	1.50	0.58	2.00	1.41
kelp bass, calico bass, all	10/1/2004	4	4	8.00	0.82	2.00	0.00	3.50	1.73
kelp bass, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	8/9/2004	4	4	2.50	2.89	0.50	0.58	0.50	0.58
kelp rockfish, adult	10/1/2004	4	4	4.00	2.71	0.75	0.50	0.75	0.50

## 2004 ROVING DIVER FISH COUNT:

Page: F 28

kelp rockfish, all	8/9/2004	4	4	2.50	2.89	0.50	0.58	0.50	0.58
kelp rockfish, all	10/1/2004	4	4	4.00	2.71	0.75	0.50	0.75	0.50
kelp rockfish, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
ocean whitefish	10/1/2004	4	2	6.50	2.12	1.00	0.00	1.00	0.00
olive rockfish, adult	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, adult	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	8/9/2004	4	4	9.75	0.50	2.25	0.50	11.00	4.08
opaleye, adult	10/1/2004	4	4	10.00	0.00	2.50	0.58	13.50	4.65
opaleye, all	8/9/2004	4	4	9.75	0.50	2.25	0.50	11.00	4.08
opaleye, all	10/1/2004	4	4	10.00	0.00	2.50	0.58	13.50	4.65
opaleye, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
Pacific sardine	10/1/2004	4	3	9.33	0.58	4.00	0.00	55000.00	63639.61
painted greenling	8/9/2004	4	4	10.00	0.00	3.00	0.00	42.25	18.26
painted greenling	10/1/2004	4	4	10.00	0.00	3.00	0.00	68.00	24.26
pile surfperch, adult	8/9/2004	4	4	7.50	2.89	1.50	0.58	1.75	0.96
pile surfperch, adult	10/1/2004	4	4	9.75	0.50	2.25	0.50	7.75	7.54
pile surfperch, all	8/9/2004	4	4	7.50	2.89	1.50	0.58	1.75	0.96
pile surfperch, all	10/1/2004	4	4	9.75	0.50	2.25	0.50	7.75	7.54
pile surfperch, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	8/9/2004	4	4	10.00	0.00	2.00	0.00	5.00	3.56
rock wrasse, female	10/1/2004	4	4	10.00	0.00	2.00	0.00	3.25	0.96
rock wrasse, male	8/9/2004	4	4	6.25	4.50	0.75	0.50	0.75	0.50
rock wrasse, male	10/1/2004	4	4	8.25	1.50	1.50	0.58	1.50	0.58
senorita, adult	8/9/2004	4	4	10.00	0.00	3.00	0.00	32.00	13.09
senorita, adult	10/1/2004	4	4	10.00	0.00	3.50	1.00	152.00	104.96
senorita, all	8/9/2004	4	4	10.00	0.00	3.00	0.00	41.50	19.40
senorita, all	10/1/2004	4	4	10.00	0.00	4.00	0.00	266.50	87.00
senorita, juvenile	8/9/2004	4	4	4.00	4.90	1.25	1.50	9.50	16.44
senorita, juvenile	10/1/2004	4	4	10.00	0.00	3.25	0.96	114.50	100.29
striped surfperch, adult	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	8/9/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	10/1/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
stripedfin ronquil	10/1/2004	4	2	7.00	0.00	1.00	0.00	1.00	0.00
swell shark	10/1/2004	4	1	7.00		1.00		1.00	
treefish, adult	8/9/2004	4	4	7.50	1.29	1.25	0.50	2.75	3.50
treefish, adult	10/1/2004	4	4	8.50	1.00	2.00	0.00	4.00	2.71
treefish, juvenile	8/9/2004	4	4	8.50	1.00	2.00	0.00	3.50	1.00
treefish, juvenile	10/1/2004	4	4	7.50	1.91	2.00	0.00	2.25	0.50
zebra goby	10/1/2004	4	1	10.00		1.00		1.00	

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black surfperch, adult	6/7/2004	3	3	8.33	0.58	1.67	0.58	1.67	0.58
black surfperch, adult	8/10/2004	5	4	9.50	0.58	3.00	0.00	22.00	11.52
black surfperch, all	6/7/2004	3	3	8.33	0.58	1.67	0.58	1.67	0.58
black surfperch, all	8/10/2004	5	5	9.80	0.45	3.00	0.00	32.00	10.52
black surfperch, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	8/10/2004	5	4	8.75	1.50	2.50	0.58	10.00	2.94
blackeye goby	6/7/2004	3	3	10.00	0.00	3.00	0.00	38.50	13.44
blackeye goby	8/10/2004	5	5	9.80	0.45	3.60	0.55	105.33	101.71
blacksmith, adult	6/7/2004	3	3	10.00	0.00	4.00	0.00	237.00	86.27
blacksmith, adult	8/10/2004	5	4	9.75	0.50	4.00	0.00	444.67	138.08
blacksmith, all	6/7/2004	3	3	10.00	0.00	4.00	0.00	237.00	86.27
blacksmith, all	8/10/2004	5	5	9.80	0.45	4.00	0.00	444.67	138.08
blacksmith, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	8/10/2004	5	4	2.00	4.00	0.50	1.00	0.50	1.00
blue rockfish, adult	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	8/10/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	8/10/2004	5	4	1.50	3.00	0.25	0.50	0.25	0.50
blue rockfish, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	8/10/2004	5	4	1.50	3.00	0.25	0.50	0.25	0.50
blue-banded goby	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/10/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
bocaccio, juvenile	8/10/2004	5	1	5.00		2.00		8.00	
California sheephead, female	6/7/2004	3	3	9.00	0.00	2.00	0.00	2.67	1.15
California sheephead, female	8/10/2004	5	5	8.80	0.84	1.80	0.45	3.80	2.28
California sheephead, juvenile	6/7/2004	3	3	4.67	4.04	0.67	0.58	0.67	0.58
California sheephead, juvenile	8/10/2004	5	5	3.80	5.22	0.60	0.89	0.60	0.89
California sheephead, male	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	8/10/2004	5	5	1.60	3.58	0.20	0.45	0.20	0.45
garibaldi, adult	6/7/2004	3	3	9.33	0.58	3.00	0.00	14.33	1.15
garibaldi, adult	8/10/2004	5	5	10.00	0.00	2.60	0.55	15.40	5.90
garibaldi, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	8/10/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish	8/10/2004	5	2	9.00	1.41	1.50	0.71	1.50	0.71
giant kelpfish, juvenile	6/7/2004	3	1	5.00		1.00		1.00	
giant kelpfish, juvenile	8/10/2004	5	5	9.80	0.45	3.80	0.45	240.25	146.42
gopher rockfish	6/7/2004	3	1	9.00		1.00		1.00	
gopher/copper rockfish, juvenile	8/10/2004	5	1	6.00		1.00		1.00	
halfmoon	6/7/2004	3	2	7.50	0.71	2.00	0.00	2.50	0.71
halfmoon	8/10/2004	5	3	8.67	1.53	1.00	0.00	1.00	0.00
island kelpfish	6/7/2004	3	3	2.33	4.04	0.67	1.15	1.33	2.31
island kelpfish	8/10/2004	5	5	8.40	1.14	2.20	0.45	8.20	5.17
kelp bass, adult	6/7/2004	3	3	9.67	0.58	2.67	0.58	14.00	5.66
kelp bass, adult	8/10/2004	5	4	10.00	0.00	2.50	0.58	10.50	6.03
kelp bass, calico bass, all	6/7/2004	3	3	9.67	0.58	2.67	0.58	14.00	5.66
kelp bass, calico bass, all	8/10/2004	5	5	10.00	0.00	2.60	0.55	11.80	5.54
kelp bass, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	8/10/2004	5	4	6.25	4.79	1.25	0.96	1.50	1.29
kelp rockfish, adult	6/7/2004	3	3	2.33	4.04	0.67	1.15	0.67	1.15

## 2004 ROVING DIVER FISH COUNT:

Page: F 30

kelp rockfish, adult	8/10/2004	5	4	6.00	4.32	1.00	0.82	1.25	1.26
kelp rockfish, all	6/7/2004	3	3	2.33	4.04	0.67	1.15	0.67	1.15
kelp rockfish, all	8/10/2004	5	5	7.60	4.28	1.80	1.10	6.00	4.18
kelp rockfish, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	8/10/2004	5	4	5.75	4.27	1.50	1.00	5.25	4.11
kelp surfperch	6/7/2004	3	2	8.00	2.83	1.50	0.71	1.50	0.71
kelp surfperch	8/10/2004	5	5	9.20	1.79	3.00	0.71	15.25	9.64
kelpfish spp.	6/7/2004	3	1	6.00		2.00		2.00	
ocean whitefish	6/7/2004	3	2	8.50	0.71	1.50	0.71	2.00	1.41
ocean whitefish	8/10/2004	5	1	7.00		1.00		1.00	
olive rockfish, adult	6/7/2004	3	3	9.00	0.00	3.00	0.00	23.50	14.85
olive rockfish, adult	8/10/2004	5	4	6.50	4.36	1.50	1.00	2.25	1.71
olive rockfish, all	6/7/2004	3	3	9.00	0.00	3.00	0.00	23.50	14.85
olive rockfish, all	8/10/2004	5	5	5.20	4.76	1.20	1.10	2.80	3.11
olive/yellowtail rockfish, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	8/10/2004	5	4	3.75	4.50	1.00	1.15	1.25	1.50
opaleye, adult	6/7/2004	3	3	3.33	5.77	0.67	1.15	2.00	3.46
opaleye, adult	8/10/2004	5	4	10.00	0.00	3.00	0.00	19.50	4.04
opaleye, all	6/7/2004	3	3	3.33	5.77	0.67	1.15	2.00	3.46
opaleye, all	8/10/2004	5	5	10.00	0.00	3.00	0.00	20.60	4.28
opaleye, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	8/10/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	6/7/2004	3	3	9.33	0.58	2.67	0.58	9.00	5.66
painted greenling	8/10/2004	5	5	9.40	0.89	2.80	0.45	14.20	7.05
pile surfperch, adult	6/7/2004	3	3	7.67	1.53	1.33	0.58	1.33	0.58
pile surfperch, adult	8/10/2004	5	4	9.50	0.58	2.00	0.00	4.75	3.59
pile surfperch, all	6/7/2004	3	3	7.67	1.53	1.33	0.58	1.33	0.58
pile surfperch, all	8/10/2004	5	5	9.40	0.55	2.00	0.00	4.80	3.11
pile surfperch, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	8/10/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	8/10/2004	5	5	8.60	1.52	1.80	0.45	2.20	1.10
rock wrasse, male	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	8/10/2004	5	5	4.40	4.28	0.60	0.55	0.60	0.55
rubberlip surfperch	8/10/2004	5	1	5.00		1.00		1.00	
senorita, adult	6/7/2004	3	3	9.67	0.58	1.67	0.58	2.33	1.15
senorita, adult	8/10/2004	5	4	10.00	0.00	2.75	0.50	22.50	22.65
senorita, all	6/7/2004	3	3	9.67	0.58	1.67	0.58	2.33	1.15
senorita, all	8/10/2004	5	5	10.00	0.00	3.80	0.45	138.75	85.80
senorita, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
senorita, juvenile	8/10/2004	5	4	8.50	2.38	3.50	0.58	116.25	64.21
shiner surfperch	8/10/2004	5	4	10.00	0.00	4.00	0.00	470.00	132.66
striped surfperch, adult	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	8/10/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	8/10/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	8/10/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
swell shark	6/7/2004	3	1	8.00		1.00		1.00	
top smelt	8/10/2004	5	1	10.00		2.00		8.00	
treefish, adult	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	8/10/2004	5	5	8.20	1.10	1.40	0.55	1.40	0.55
treefish, juvenile	6/7/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	8/10/2004	5	5	1.60	3.58	0.40	0.89	0.40	0.89
white sea bass	6/7/2004	3	1	7.00		2.00		2.00	

2004 ROVING DIVER FISH COUNT:  
Anacapa Island - Landing Cove

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
bat ray	7/16/2004	6	2	10.00	0.00	1.00	0.00	1.00	0.00
black surfperch, adult	7/16/2004	6	6	9.83	0.41	2.83	0.41	13.17	3.71
black surfperch, adult	8/11/2004	5	4	9.75	0.50	2.50	0.58	12.25	3.30
black surfperch, all	7/16/2004	6	6	10.00	0.00	2.83	0.41	14.67	3.50
black surfperch, all	8/11/2004	5	5	7.80	4.38	2.40	1.34	12.00	6.75
black surfperch, juvenile	7/16/2004	6	6	5.67	4.76	1.17	0.98	1.50	1.52
black surfperch, juvenile	8/11/2004	5	4	6.25	4.79	1.25	0.96	2.75	2.75
blackeye goby	7/16/2004	6	6	9.50	0.84	2.67	0.52	14.80	8.76
blackeye goby	8/11/2004	5	5	9.40	0.89	2.40	0.55	19.20	15.93
blacksmith, adult	7/16/2004	6	6	9.83	0.41	4.00	0.00	291.00	134.99
blacksmith, adult	8/11/2004	5	4	9.50	1.00	3.25	0.50	71.25	43.18
blacksmith, all	7/16/2004	6	6	9.83	0.41	4.00	0.00	291.00	134.99
blacksmith, all	8/11/2004	5	5	9.60	0.89	3.40	0.55	71.25	43.18
blacksmith, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	8/11/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	8/11/2004	5	5	1.60	3.58	0.20	0.45	0.20	0.45
bocaccio, juvenile	8/11/2004	5	1	7.00		2.00		4.00	
California sheephead, female	7/16/2004	6	6	9.83	0.41	2.50	0.55	9.17	3.43
California sheephead, female	8/11/2004	5	5	9.40	0.55	1.80	0.45	4.60	2.61
California sheephead, juvenile	7/16/2004	6	6	6.33	3.20	0.83	0.41	0.83	0.41
California sheephead, juvenile	8/11/2004	5	5	3.60	3.29	0.80	0.84	0.80	0.84
California sheephead, male	7/16/2004	6	6	9.50	0.84	1.83	0.41	2.50	1.05
California sheephead, male	8/11/2004	5	5	3.60	3.29	0.80	0.84	0.80	0.84
garibaldi, adult	7/16/2004	6	6	9.83	0.41	2.67	0.52	14.00	5.40
garibaldi, adult	8/11/2004	5	5	10.00	0.00	2.60	0.55	11.60	3.21
garibaldi, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	8/11/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish	7/16/2004	6	2	6.00	0.00	1.50	0.71	1.50	0.71
giant kelpfish	8/11/2004	5	5	8.80	2.17	1.20	0.45	1.60	1.34
giant kelpfish, juvenile	7/16/2004	6	1	9.00		2.00		6.00	
giant kelpfish, juvenile	8/11/2004	5	4	9.50	0.58	2.50	0.58	16.50	18.30
gopher/copper rockfish, juvenile	7/16/2004	6	1	7.00		1.00		1.00	
gopher/copper rockfish, juvenile	8/11/2004	5	1	9.00		2.00		3.00	
halfmoon	7/16/2004	6	2	6.50	0.71	1.50	0.71	1.50	0.71
halfmoon	8/11/2004	5	5	9.00	1.73	2.00	0.71	5.80	3.63
island kelpfish	7/16/2004	6	6	7.50	3.73	1.50	1.05	4.67	6.35
island kelpfish	8/11/2004	5	5	9.00	1.41	2.20	0.84	10.20	7.53
kelp bass, adult	7/16/2004	6	6	9.83	0.41	3.00	0.00	19.00	5.40
kelp bass, adult	8/11/2004	5	4	10.00	0.00	3.00	0.00	26.50	10.66
kelp bass, calico bass, all	7/16/2004	6	6	9.83	0.41	3.00	0.00	19.00	5.40
kelp bass, calico bass, all	8/11/2004	5	5	10.00	0.00	3.00	0.00	29.60	10.60
kelp bass, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00

## 2004 ROVING DIVER FISH COUNT:

Page: F 32

kelp bass, juvenile	8/11/2004	5	4	1.75	3.50	0.50	1.00	0.50	1.00
kelp rockfish, adult	7/16/2004	6	6	6.33	3.20	1.50	0.84	1.83	1.33
kelp rockfish, adult	8/11/2004	5	4	7.00	1.83	1.50	0.58	2.00	1.15
kelp rockfish, all	7/16/2004	6	6	6.33	3.20	1.50	0.84	2.00	1.67
kelp rockfish, all	8/11/2004	5	5	6.80	1.64	1.60	0.55	3.00	2.35
kelp rockfish, juvenile	7/16/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41
kelp rockfish, juvenile	8/11/2004	5	4	3.50	4.04	1.00	1.15	1.25	1.50
kelp surfperch	7/16/2004	6	5	7.80	2.17	2.20	0.45	7.80	4.32
kelp surfperch	8/11/2004	5	5	10.00	0.00	3.20	0.45	54.00	25.91
northern anchovy	8/11/2004	5	2	7.50	3.54	4.00	0.00	850.00	919.24
ocean whitefish	7/16/2004	6	1	8.00		2.00		3.00	
olive rockfish, adult	7/16/2004	6	6	5.67	4.76	1.17	0.98	1.50	1.52
olive rockfish, adult	8/11/2004	5	4	1.75	3.50	0.25	0.50	0.25	0.50
olive rockfish, all	7/16/2004	6	6	5.67	4.76	1.17	0.98	2.17	2.40
olive rockfish, all	8/11/2004	5	5	3.20	4.44	0.60	0.89	0.60	0.89
olive/yellowtail rockfish, juvenile	7/16/2004	6	6	1.17	2.86	0.33	0.82	0.67	1.63
olive/yellowtail rockfish, juvenile	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	7/16/2004	6	6	7.33	2.34	2.33	0.82	11.83	6.59
opaleye, adult	8/11/2004	5	4	9.50	0.58	3.00	0.00	21.00	3.92
opaleye, all	7/16/2004	6	6	7.33	2.34	2.33	0.82	11.83	6.59
opaleye, all	8/11/2004	5	5	9.60	0.55	3.00	0.00	23.00	5.61
opaleye, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
Pacific sardine	7/16/2004	6	2	6.00	1.41	4.00	0.00	6000.00	
painted greenling	7/16/2004	6	6	7.83	3.87	1.67	0.82	3.33	2.73
painted greenling	8/11/2004	5	5	9.20	1.30	2.40	0.55	7.80	3.11
pile surfperch, adult	7/16/2004	6	6	6.17	3.71	1.33	0.82	1.50	1.05
pile surfperch, adult	8/11/2004	5	4	6.00	4.32	1.00	0.82	1.25	1.26
pile surfperch, all	7/16/2004	6	6	6.17	3.71	1.33	0.82	1.50	1.05
pile surfperch, all	8/11/2004	5	5	6.60	3.97	1.20	0.84	1.40	1.14
pile surfperch, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	7/16/2004	6	6	4.17	4.92	0.83	0.98	1.17	1.60
rock wrasse, female	8/11/2004	5	5	5.20	5.02	1.00	1.00	1.00	1.00
rock wrasse, juvenile	7/16/2004	6	1	9.00		2.00		9.00	
rock wrasse, male	7/16/2004	6	6	4.83	4.12	1.00	0.89	1.00	0.89
rock wrasse, male	8/11/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
sculpin spp.	8/11/2004	5	1	9.00		1.00		1.00	
senorita, adult	7/16/2004	6	6	10.00	0.00	2.83	0.41	25.60	21.96
senorita, adult	8/11/2004	5	4	10.00	0.00	3.00	0.00	32.50	8.81
senorita, all	7/16/2004	6	6	10.00	0.00	3.67	0.52	247.20	279.75
senorita, all	8/11/2004	5	5	10.00	0.00	3.60	0.55	195.00	196.60
senorita, juvenile	7/16/2004	6	6	8.00	3.95	3.00	1.55	184.67	272.84
senorita, juvenile	8/11/2004	5	4	2.50	2.89	2.00	2.31	162.50	188.75
snubnose sculpin	7/16/2004	6	1	10.00		1.00		1.00	
striped surfperch, adult	7/16/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41
striped surfperch, adult	8/11/2004	5	4	1.50	3.00	0.25	0.50	0.25	0.50
striped surfperch, all	7/16/2004	6	6	1.67	4.08	0.17	0.41	0.17	0.41
striped surfperch, all	8/11/2004	5	5	1.20	2.68	0.20	0.45	0.20	0.45
striped surfperch, juvenile	7/16/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	8/11/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
top smelt	8/11/2004	5	2	9.50	0.71	3.50	0.71	45.00	
treefish, adult	7/16/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41
treefish, adult	8/11/2004	5	5	6.00	3.54	1.20	0.84	1.20	0.84
treefish, juvenile	7/16/2004	6	6	4.00	4.43	0.67	0.82	0.67	0.82
treefish, juvenile	8/11/2004	5	5	6.20	3.77	1.20	0.84	2.60	3.65
zebra goby	8/11/2004	5	2	6.50	2.12	1.00	0.00	1.00	0.00

2004 ROVING DIVER FISH COUNT:  
 Santa Barbara Island - SE Sea Lion Rookery

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black and yellow rockfish	6/9/2004	5	1	6.00		1.00		1.00	
black and yellow rockfish	9/13/2004	3	1	9.00		1.00		1.00	
black surfperch, adult	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, adult	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, all	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, all	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	6/9/2004	5	5	10.00	0.00	2.60	0.55	16.80	8.23
blackeye goby	9/13/2004	3	3	10.00	0.00	3.33	0.58	98.33	43.84
blacksmith, adult	6/9/2004	5	3	5.33	4.73	1.00	1.00	1.33	1.53
blacksmith, adult	9/13/2004	3	3	9.67	0.58	3.33	0.58	103.33	95.82
blacksmith, all	6/9/2004	5	5	3.20	4.44	0.60	0.89	0.80	1.30
blacksmith, all	9/13/2004	3	3	9.67	0.58	3.33	0.58	112.33	96.13
blacksmith, juvenile	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/13/2004	3	3	8.00	2.65	2.00	0.00	9.00	1.73
blue rockfish, adult	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
California scorpionfish	9/13/2004	3	2	6.50	0.71	1.50	0.71	1.50	0.71
California sheephead, female	6/9/2004	5	5	1.40	3.13	0.20	0.45	0.20	0.45
California sheephead, female	9/13/2004	3	3	8.00	2.65	2.00	0.00	3.33	1.53
California sheephead, juvenile	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
coralline sculpin	9/13/2004	3	2	8.00	2.83	1.50	0.71	2.00	1.41
garibaldi, adult	6/9/2004	5	5	8.00	0.71	1.80	0.45	2.60	1.34
garibaldi, adult	9/13/2004	3	3	8.33	2.89	2.00	0.00	4.00	1.00
garibaldi, juvenile	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
island kelpfish	6/9/2004	5	5	3.80	5.22	0.80	1.10	1.00	1.15
island kelpfish	9/13/2004	3	3	10.00	0.00	2.33	0.58	9.00	5.00
kelp bass, adult	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, adult	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, calico bass, all	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, calico bass, all	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, all	6/9/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, all	9/13/2004	3	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	6/9/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00



2004 ROVING DIVER FISH COUNT:  
Santa Barbara Island - Arch Point

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
bat ray	6/8/2004	6	1	6.00		1.00		1.00	
bat ray	9/14/2004	5	3	7.67	1.15	1.00	0.00	1.00	0.00
black surfperch, adult	6/8/2004	6	4	5.75	3.95	1.00	0.82	1.25	1.26
black surfperch, adult	9/14/2004	5	5	7.20	0.84	1.60	0.55	2.20	1.30
black surfperch, all	6/8/2004	6	6	5.50	4.42	0.83	0.75	1.00	1.10
black surfperch, all	9/14/2004	5	5	7.40	0.89	1.80	0.45	2.40	1.14
black surfperch, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/14/2004	5	5	1.60	3.58	0.20	0.45	0.20	0.45
blackeye goby	6/8/2004	6	6	9.50	1.22	2.50	0.55	11.33	9.00
blackeye goby	9/14/2004	5	5	9.40	0.55	2.80	0.45	36.80	24.07
blacksmith, adult	6/8/2004	6	4	10.00	0.00	4.00	0.00	376.75	61.28
blacksmith, adult	9/14/2004	5	5	10.00	0.00	4.00	0.00	151.20	20.90
blacksmith, all	6/8/2004	6	6	10.00	0.00	4.00	0.00	313.33	121.22
blacksmith, all	9/14/2004	5	5	10.00	0.00	4.00	0.00	621.00	196.37
blacksmith, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/14/2004	5	5	9.20	0.84	4.00	0.00	462.75	193.43
blue rockfish, adult	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
cabezon	6/8/2004	6	3	8.00	2.00	2.00	0.00	2.00	0.00
cabezon	9/14/2004	5	3	7.67	0.58	1.00	0.00	1.00	0.00
California moray	9/14/2004	5	1	7.00		2.00		2.00	
California sheephead, female	6/8/2004	6	6	7.67	1.75	1.83	0.75	4.50	4.59
California sheephead, female	9/14/2004	5	5	9.80	0.45	2.20	0.45	5.60	3.36
California sheephead, juvenile	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, juvenile	9/14/2004	5	5	4.20	2.39	1.00	0.71	1.20	1.10
California sheephead, male	6/8/2004	6	6	6.50	0.55	1.33	0.52	1.67	1.03
California sheephead, male	9/14/2004	5	5	7.20	4.21	1.40	0.89	2.00	1.58
coralline sculpin	6/8/2004	6	1	6.00		1.00		1.00	
fringehead spp.	6/8/2004	6	1	6.00		1.00		1.00	
garibaldi, adult	6/8/2004	6	6	10.00	0.00	3.00	0.00	33.67	10.48
garibaldi, adult	9/14/2004	5	5	10.00	0.00	3.00	0.00	40.00	5.57
garibaldi, juvenile	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
giant black sea bass	9/14/2004	5	4	6.75	0.50	1.00	0.00	1.00	0.00
grass rockfish	6/8/2004	6	1	7.00		1.00		1.00	
halfmoon	6/8/2004	6	6	9.50	0.84	2.83	0.41	14.17	3.06
halfmoon	9/14/2004	5	5	10.00	0.00	2.60	0.55	15.40	9.96
island kelpfish	6/8/2004	6	6	6.67	3.56	1.67	1.03	4.67	4.41
island kelpfish	9/14/2004	5	5	10.00	0.00	2.80	0.45	20.80	9.09
kelp bass, adult	6/8/2004	6	4	9.75	0.50	2.25	0.50	9.00	2.58
kelp bass, adult	9/14/2004	5	5	9.00	1.00	2.00	0.00	6.40	2.07
kelp bass, calico bass, all	6/8/2004	6	6	9.67	0.52	2.17	0.41	7.33	3.27
kelp bass, calico bass, all	9/14/2004	5	5	9.00	1.00	2.00	0.00	6.40	2.07

## 2004 ROVING DIVER FISH COUNT:

Page: F 36

kelp bass, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, all	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, adult	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	6/8/2004	6	6	1.33	3.27	0.17	0.41	0.17	0.41
olive rockfish, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	6/8/2004	6	4	10.00	0.00	2.75	0.50	19.50	11.12
opaleye, adult	9/14/2004	5	5	10.00	0.00	2.80	0.45	28.80	13.14
opaleye, all	6/8/2004	6	6	9.83	0.41	2.67	0.52	16.83	9.97
opaleye, all	9/14/2004	5	5	10.00	0.00	2.80	0.45	28.80	13.14
opaleye, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/14/2004	5	5	2.00	4.47	0.40	0.89	0.00	0.00
painted greenling	6/8/2004	6	6	9.50	0.55	3.00	0.00	15.50	2.88
painted greenling	9/14/2004	5	5	9.80	0.45	2.60	0.55	12.40	4.98
pile surfperch, adult	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	6/8/2004	6	6	1.17	2.86	0.17	0.41	0.17	0.41
rock wrasse, female	9/14/2004	5	5	2.80	4.09	0.40	0.55	0.40	0.55
rock wrasse, male	6/8/2004	6	6	2.83	3.19	0.50	0.55	0.50	0.55
rock wrasse, male	9/14/2004	5	5	3.20	4.60	0.60	0.89	0.60	0.89
senorita, adult	6/8/2004	6	4	9.75	0.50	2.75	0.50	10.75	4.57
senorita, adult	9/14/2004	5	5	10.00	0.00	3.00	0.00	22.80	5.50
senorita, all	6/8/2004	6	6	9.67	0.52	3.50	0.55	167.80	207.63
senorita, all	9/14/2004	5	5	10.00	0.00	4.00	0.00	1395.75	363.73
senorita, juvenile	6/8/2004	6	5	7.40	4.22	3.00	1.73	243.33	240.07
senorita, juvenile	9/14/2004	5	5	9.80	0.45	4.00	0.00	1371.00	366.12
snubnose sculpin	6/8/2004	6	1	5.00		2.00		2.00	
snubnose sculpin	9/14/2004	5	2	5.00	0.00	2.00	0.00	2.00	0.00
striped surfperch, adult	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	6/8/2004	6	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
top smelt	9/14/2004	5	3	9.33	1.15	3.00	0.00	17.00	3.61
treefish, adult	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	9/14/2004	5	5	3.20	4.38	0.60	0.89	0.60	0.89
treefish, juvenile	6/8/2004	6	6	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00

2004 ROVING DIVER FISH COUNT:  
Santa Barbara Island - Cat Canyon

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black surfperch, adult	6/27/2004	5	4	4.50	3.11	1.25	0.96	1.25	0.96
black surfperch, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, all	6/27/2004	5	5	4.80	2.77	1.40	0.89	1.40	0.89
black surfperch, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
black surfperch, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	6/27/2004	5	5	9.20	1.30	2.40	0.55	10.20	3.11
blackeye goby	9/14/2004	5	5	9.60	0.89	2.60	0.55	16.00	10.93
blacksmith, adult	6/27/2004	5	4	10.00	0.00	3.50	0.58	121.50	81.32
blacksmith, adult	9/14/2004	5	5	9.80	0.45	3.00	0.00	45.80	9.31
blacksmith, all	6/27/2004	5	5	10.00	0.00	3.60	0.55	121.50	81.32
blacksmith, all	9/14/2004	5	5	9.80	0.45	3.20	0.45	75.40	47.49
blacksmith, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blacksmith, juvenile	9/14/2004	5	5	7.20	4.21	2.40	1.52	29.60	46.43
blue rockfish, adult	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
cabezon	9/14/2004	5	1	7.00		1.00		1.00	
California scorpionfish	9/14/2004	5	1	9.00		1.00		1.00	
California sheephead, female	6/27/2004	5	5	7.80	1.79	2.00	0.00	3.40	1.52
California sheephead, female	9/14/2004	5	5	7.40	4.22	1.60	0.89	3.40	2.70
California sheephead, juvenile	6/27/2004	5	5	1.00	2.24	0.20	0.45	0.20	0.45
California sheephead, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, male	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
coralline sculpin	6/27/2004	5	1	6.00		2.00		3.00	
coralline sculpin	9/14/2004	5	1	7.00		1.00		1.00	
garibaldi, adult	6/27/2004	5	5	10.00	0.00	2.60	0.55	11.20	2.77
garibaldi, adult	9/14/2004	5	5	10.00	0.00	2.80	0.45	17.40	5.98
garibaldi, juvenile	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
garibaldi, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish, juvenile	9/14/2004	5	1	6.00		1.00		1.00	
halfmoon	6/27/2004	5	5	6.40	2.07	1.20	0.45	1.20	0.45
halfmoon	9/14/2004	5	4	7.50	2.08	1.50	0.58	3.75	3.20
island kelpfish	6/27/2004	5	5	9.60	0.55	2.00	0.00	6.60	1.67
island kelpfish	9/14/2004	5	5	9.60	0.55	2.60	0.55	13.00	6.67
kelp bass, adult	6/27/2004	5	4	2.50	5.00	0.25	0.50	0.25	0.50
kelp bass, adult	9/14/2004	5	5	1.60	3.58	0.20	0.45	0.20	0.45
kelp bass, calico bass, all	6/27/2004	5	5	2.00	4.47	0.20	0.45	0.20	0.45
kelp bass, calico bass, all	9/14/2004	5	5	1.60	3.58	0.20	0.45	0.20	0.45
kelp bass, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp bass, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	6/27/2004	5	4	2.50	5.00	0.25	0.50	0.25	0.50
kelp rockfish, adult	9/14/2004	5	5	3.20	4.38	0.60	0.89	0.60	0.89

## 2004 ROVING DIVER FISH COUNT:

Page: F 38

kelp rockfish, all	6/27/2004	5	5	2.00	4.47	0.20	0.45	0.20	0.45
kelp rockfish, all	9/14/2004	5	5	3.20	4.38	0.60	0.89	0.60	0.89
kelp rockfish, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
kelpfish spp.	9/14/2004	5	1	6.00		1.00		1.00	
ocean whitefish	6/27/2004	5	1	10.00		1.00		1.00	
olive rockfish, adult	6/27/2004	5	4	2.50	5.00	0.25	0.50	0.25	0.50
olive rockfish, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	6/27/2004	5	5	2.00	4.47	0.20	0.45	0.20	0.45
olive rockfish, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	6/27/2004	5	4	8.25	2.06	1.75	0.50	3.75	2.50
opaleye, adult	9/14/2004	5	5	9.00	1.41	2.00	0.00	5.80	2.59
opaleye, all	6/27/2004	5	5	6.60	4.10	1.40	0.89	3.00	2.74
opaleye, all	9/14/2004	5	5	9.00	1.41	2.00	0.00	5.80	2.59
opaleye, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	6/27/2004	5	5	9.80	0.45	2.40	0.55	10.20	3.70
painted greenling	9/14/2004	5	5	8.80	0.45	2.00	0.00	5.00	1.41
pile surfperch, adult	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	6/27/2004	5	5	1.00	2.24	0.20	0.45	0.20	0.45
pile surfperch, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	6/27/2004	5	5	6.20	3.63	1.20	0.84	1.20	0.84
rock wrasse, female	9/14/2004	5	5	5.40	5.08	0.60	0.55	0.60	0.55
rock wrasse, male	6/27/2004	5	5	5.80	3.70	1.20	0.84	1.40	1.14
rock wrasse, male	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
roughcheek sculpin	6/27/2004	5	1	5.00		1.00		1.00	
sculpin spp.	9/14/2004	5	1	5.00		1.00		1.00	
senorita, adult	6/27/2004	5	4	10.00	0.00	3.50	0.58	118.75	51.70
senorita, adult	9/14/2004	5	5	10.00	0.00	3.20	0.45	61.00	32.07
senorita, all	6/27/2004	5	5	10.00	0.00	4.00	0.00	245.67	71.67
senorita, all	9/14/2004	5	5	10.00	0.00	4.00	0.00	596.00	394.21
senorita, juvenile	6/27/2004	5	4	9.75	0.50	3.50	0.58	110.67	79.00
senorita, juvenile	9/14/2004	5	5	9.60	0.55	4.00	0.00	535.00	367.00
snubnose sculpin	6/27/2004	5	3	7.33	0.58	1.67	0.58	2.33	1.53
snubnose sculpin	9/14/2004	5	1	7.00		1.00		1.00	
striped surfperch, adult	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	6/27/2004	5	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
stripetail rockfish	6/27/2004	5	1	9.00		2.00		2.00	
top smelt	6/27/2004	5	1	10.00		3.00			
top smelt	9/14/2004	5	2	10.00	0.00	3.50	0.71	115.00	21.21
treefish, adult	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	6/27/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	9/14/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
yellowfin fringehead	9/14/2004	5	1	5.00		1.00		1.00	

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black surfperch, adult	6/24/2004	5	3	4.67	4.51	0.67	0.58	0.67	0.58
black surfperch, all	6/24/2004	5	5	4.40	4.28	0.60	0.55	0.60	0.55
black surfperch, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	6/24/2004	5	5	6.40	3.65	1.40	1.14	3.40	4.93
blacksmith, adult	6/24/2004	5	3	9.67	0.58	3.00	0.00	55.00	25.24
blacksmith, all	6/24/2004	5	5	9.80	0.45	3.00	0.00	50.60	20.38
blacksmith, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, female	6/24/2004	5	5	9.60	0.55	3.00	0.00	18.40	2.88
California sheephead, juvenile	6/24/2004	5	5	1.20	2.68	0.40	0.89	0.40	0.89
California sheephead, male	6/24/2004	5	5	10.00	0.00	2.80	0.45	14.60	4.04
garibaldi, adult	6/24/2004	5	5	10.00	0.00	2.00	0.00	8.20	1.64
garibaldi, juvenile	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish	6/24/2004	5	1	6.00		1.00		1.00	
island kelpfish	6/24/2004	5	5	5.00	4.64	1.20	1.10	2.00	2.12
kelp bass, adult	6/24/2004	5	3	10.00	0.00	3.00	0.00	35.00	5.29
kelp bass, calico bass, all	6/24/2004	5	5	10.00	0.00	3.00	0.00	35.20	6.50
kelp bass, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	6/24/2004	5	3	4.67	4.16	0.67	0.58	0.67	0.58
kelp rockfish, all	6/24/2004	5	5	4.80	4.60	0.60	0.55	0.60	0.55
kelp rockfish, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp surfperch	6/24/2004	5	3	8.00	2.00	1.00	0.00	1.00	0.00
ocean whitefish	6/24/2004	5	4	9.00	1.15	2.00	0.00	5.25	2.63
olive rockfish, adult	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
olive rockfish, all	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
olive/yellowtail rockfish, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, all	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	6/24/2004	5	5	6.20	3.49	1.40	0.89	1.40	0.89
pile surfperch, adult	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, female	6/24/2004	5	5	6.60	4.16	1.20	0.84	1.80	1.92
rock wrasse, male	6/24/2004	5	5	9.60	0.89	1.80	0.45	2.40	0.89
senorita, adult	6/24/2004	5	3	10.00	0.00	3.67	0.58	167.00	126.53
senorita, all	6/24/2004	5	5	10.00	0.00	4.00	0.00	327.00	230.96
senorita, juvenile	6/24/2004	5	3	10.00	0.00	3.67	0.58	225.67	231.08
snubnose sculpin	6/24/2004	5	1	8.00		1.00		1.00	
striped surfperch, adult	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	6/24/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
treefish, juvenile	6/24/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
black surfperch, adult	6/22/2004	4	4	6.50	4.51	1.50	1.00	4.00	2.83
black surfperch, all	6/22/2004	4	4	7.25	4.86	1.50	1.00	4.75	3.20
black surfperch, juvenile	6/22/2004	4	4	4.50	5.26	0.75	0.96	0.75	0.96
blackeye goby	6/22/2004	4	4	9.50	0.58	2.75	0.50	18.75	8.42
blacksmith, adult	6/22/2004	4	4	9.75	0.50	3.00	0.00	39.50	24.17
blacksmith, all	6/22/2004	4	4	9.75	0.50	3.00	0.00	39.50	24.17
blacksmith, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	6/22/2004	4	4	3.50	4.12	0.75	0.96	1.00	1.41
California scorpionfish	6/22/2004	4	3	9.33	1.15	1.00	0.00	1.00	0.00
California sheephead, female	6/22/2004	4	4	10.00	0.00	3.00	0.00	20.75	4.65
California sheephead, juvenile	6/22/2004	4	4	9.75	0.50	2.50	0.58	12.00	4.08
California sheephead, male	6/22/2004	4	4	9.00	0.82	2.00	0.00	4.25	2.63
garibaldi, adult	6/22/2004	4	4	9.25	0.96	2.75	0.50	12.75	4.72
garibaldi, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
giant kelpfish	6/22/2004	4	1	10.00		1.00		1.00	
island kelpfish	6/22/2004	4	4	2.00	4.00	0.25	0.50	0.25	0.50
kelp bass, adult	6/22/2004	4	4	9.75	0.50	2.75	0.50	14.75	6.08
kelp bass, calico bass, all	6/22/2004	4	4	9.75	0.50	2.75	0.50	14.75	6.08
kelp bass, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	6/22/2004	4	4	9.25	0.50	3.00	0.00	18.50	4.65
kelp rockfish, all	6/22/2004	4	4	9.25	0.50	3.00	0.00	18.50	4.65
kelp rockfish, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
kelp surfperch	6/22/2004	4	4	9.50	1.00	2.25	0.50	7.25	5.85
ocean whitefish	6/22/2004	4	3	9.00	1.00	1.00	0.00	1.00	0.00
olive rockfish, adult	6/22/2004	4	4	9.25	0.96	2.00	0.00	4.50	2.38
olive rockfish, all	6/22/2004	4	4	9.25	0.96	2.00	0.00	4.50	2.38
olive/yellowtail rockfish, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	6/22/2004	4	4	4.25	4.92	0.75	0.96	0.75	0.96
opaleye, all	6/22/2004	4	4	4.25	4.92	0.75	0.96	0.75	0.96
opaleye, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, adult	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
rainbow surfperch	6/22/2004	4	1	10.00		2.00		4.00	
rock wrasse, female	6/22/2004	4	4	8.50	1.29	1.75	0.50	2.25	1.26
rock wrasse, male	6/22/2004	4	4	5.00	5.77	1.00	1.15	1.50	1.91
senorita, adult	6/22/2004	4	4	10.00	0.00	3.50	0.58	145.50	84.94
senorita, all	6/22/2004	4	4	10.00	0.00	4.00	0.00	227.75	158.84
senorita, juvenile	6/22/2004	4	4	9.75	0.50	3.25	0.50	82.25	83.48
soupfin shark	6/22/2004	4	1	5.00		1.00		1.00	
striped surfperch, adult	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	6/22/2004	4	4	5.25	3.86	0.75	0.50	0.75	0.50
treefish, juvenile	6/22/2004	4	4	0.00	0.00	0.00	0.00	0.00	0.00

2004 ROVING DIVER FISH COUNT:

zebra goby

6/22/2004

4

1

8.00

2.00

4.00

Common Name:	Date:	Maximum # of Observers:	# of Observations:	Avg Score:	StDev Score:	Avg Abundance:	StDev Abundance:	Avg Count:	StDev Count:
bat ray	6/23/2004	5	2	10.00	0.00	1.00	0.00	1.00	0.00
black surfperch, adult	6/23/2004	5	3	8.33	1.15	2.33	0.58	10.33	5.13
black surfperch, all	6/23/2004	5	5	8.40	0.89	2.20	0.45	8.80	4.21
black surfperch, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blackeye goby	6/23/2004	5	5	1.40	3.13	0.20	0.45	0.20	0.45
blacksmith, adult	6/23/2004	5	3	8.33	0.58	3.33	0.58	194.33	289.85
blacksmith, all	6/23/2004	5	5	8.00	0.71	3.20	0.45	123.20	226.92
blacksmith, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, adult	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, all	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
blue rockfish, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
blue-banded goby	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
California sheephead, female	6/23/2004	5	5	9.80	0.45	2.80	0.45	19.80	11.10
California sheephead, juvenile	6/23/2004	5	5	3.80	5.22	0.60	0.89	1.00	1.73
California sheephead, male	6/23/2004	5	5	10.00	0.00	2.60	0.55	12.40	5.50
garibaldi, adult	6/23/2004	5	5	9.40	1.34	2.20	0.45	6.60	2.88
garibaldi, juvenile	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
gopher rockfish	6/23/2004	5	1	7.00		1.00		1.00	
island kelpfish	6/23/2004	5	5	4.60	4.22	0.80	0.84	0.80	0.84
kelp bass, adult	6/23/2004	5	3	10.00	0.00	2.67	0.58	13.00	4.58
kelp bass, calico bass, all	6/23/2004	5	5	10.00	0.00	2.80	0.45	14.80	4.44
kelp bass, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp rockfish, adult	6/23/2004	5	3	8.33	1.15	2.00	0.00	3.33	0.58
kelp rockfish, all	6/23/2004	5	5	8.80	1.10	2.00	0.00	3.20	0.84
kelp rockfish, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
kelp surfperch	6/23/2004	5	1	5.00		1.00		1.00	
ocean whitefish	6/23/2004	5	3	5.67	0.58	1.00	0.00	1.00	0.00
olive rockfish, adult	6/23/2004	5	3	2.33	4.04	0.33	0.58	0.33	0.58
olive rockfish, all	6/23/2004	5	5	4.40	4.16	1.00	1.00	1.00	1.00
olive/yellowtail rockfish, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
opaleye, adult	6/23/2004	5	3	2.33	4.04	0.33	0.58	0.33	0.58
opaleye, all	6/23/2004	5	5	1.40	3.13	0.20	0.45	0.20	0.45
opaleye, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
painted greenling	6/23/2004	5	5	7.40	0.55	1.40	0.55	1.40	0.55
pile surfperch, adult	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, all	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
pile surfperch, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
rainbow surfperch	6/23/2004	5	1	7.00		1.00		1.00	
rock wrasse, female	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
rock wrasse, male	6/23/2004	5	5	5.00	4.58	0.80	0.84	0.80	0.84
senorita, adult	6/23/2004	5	3	9.67	0.58	2.67	0.58	11.00	4.58
senorita, all	6/23/2004	5	5	9.40	0.89	2.60	0.55	10.80	4.09
senorita, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, adult	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, all	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00
striped surfperch, juvenile	6/23/2004	5	3	0.00	0.00	0.00	0.00	0.00	0.00
treefish, adult	6/23/2004	5	5	1.40	3.13	0.20	0.45	0.20	0.45
treefish, juvenile	6/23/2004	5	5	0.00	0.00	0.00	0.00	0.00	0.00





Appendix G: Natural Habitat Size Frequencies Distributions

2004 Natural Habitat Size Frequency Distributions

San Miguel Island - Wyckoff Ledge

<i>Tethya aurantia</i>		<i>Kelletia kelletii</i>		<i>Megathura crenulata</i>	
<10	0.0%	< 40	0.0%	<10	0.0%
10 - 19	0.0%	40 - 49	0.0%	10 - 19	0.0%
20 - 29	1.3%	50 - 59	1.4%	20 - 29	0.0%
30 - 39	7.8%	60 - 69	4.2%	30 - 39	0.0%
40 - 49	7.8%	70 - 79	31.9%	40 - 49	0.0%
50 - 59	7.8%	80 - 89	25.0%	50 - 59	0.0%
60 - 69	22.1%	90 - 99	29.2%	60 - 69	50.0%
70 - 79	24.7%	100 - 109	6.9%	70 - 79	0.0%
80 - 89	11.7%	110 - 119	1.4%	80 - 89	0.0%
90 - 99	6.5%	120 - 129	0.0%	90 - 99	0.0%
> 99	10.4%	130 - 139	0.0%	100 - 109	16.7%
(Cases) N=	77	140 - 149	0.0%	110 - 119	0.0%
mean	70	> 149	0.0%	> 119	33.3%
min size (mm)	23	(Cases) N=	72	(Cases) N=	6
max size (mm)	122	mean	84	mean	98
		min size (mm)	53	min size (mm)	63
		max size (mm)	115	max size (mm)	154
<i>Haliotis rufescens</i>		<i>Lithopoma gibberosum</i>		<i>Asterina miniata</i>	
<25	0.0%	<10	0.0%	<10	0.0%
25 - 34	0.0%	10 - 19	0.0%	10 - 19	0.0%
35 - 44	0.0%	20 - 29	0.0%	20 - 29	0.0%
45 - 54	4.2%	30 - 39	2.1%	30 - 39	1.4%
55 - 64	0.0%	40 - 49	20.8%	40 - 49	1.4%
65 - 74	0.0%	50 - 59	52.1%	50 - 59	15.5%
75 - 84	1.4%	60 - 69	25.0%	60 - 69	29.6%
85 - 94	1.4%	70 - 79	0.0%	70 - 79	33.8%
95 - 104	1.4%	80 - 89	0.0%	80 - 89	11.3%
105 - 114	2.8%	90 - 99	0.0%	90 - 99	1.4%
115 - 124	1.4%	100 - 109	0.0%	> 99	5.6%
125 - 134	4.2%	110 - 119	0.0%	(Cases) N=	71
135 - 144	5.6%	> 119	0.0%	mean	71
145 - 154	2.8%	(Cases) N=	48	min size (mm)	39
155 - 164	7.0%	mean	54	max size (mm)	112
165 - 174	11.3%	mean	54		
175 - 184	19.7%	min size (mm)	38		
185 - 194	22.5%	max size (mm)	66		
>195	11.3%				
(Cases) N=	71				
mean	165				
min size (mm)	45				
max size (mm)	209				

## San Miguel Island - Wyckoff Ledge

<i>Pisaster giganteus</i>		<i>Strongylocentrotus franciscanus</i>	
< 20	0.0%	< 5	0.0%
20 - 39	3.3%	5 - 9	0.0%
40 - 59	40.0%	10 - 14	0.0%
60 - 79	33.3%	15 - 19	5.0%
80 - 99	10.0%	20 - 24	6.7%
100 - 119	6.7%	25 - 29	6.1%
120 - 139	0.0%	30 - 34	6.1%
140 - 159	0.0%	35 - 39	6.1%
160 - 179	0.0%	40 - 44	6.1%
180 - 199	0.0%	45 - 49	1.7%
200 - 219	0.0%	50 - 54	3.9%
220 - 239	6.7%	55 - 59	2.8%
> 239	0.0%	60 - 64	1.1%
(Cases) N=	30	65 - 69	1.1%
mean	75	70 - 74	3.9%
min size (mm)	35	75 - 79	5.6%
		80 - 84	5.6%
max size (mm)	239	85 - 89	10.6%
		90 - 94	13.4%
		95 - 99	8.4%
		100 - 104	4.5%
		105 - 109	1.1%
		> 109	0.0%
		(Cases) N=	179
		mean	64
		min size (mm)	15
		max size (mm)	106
		<i>Strongylocentrotus purpuratus</i>	
		< 5	0.0%
		5 - 9	0.7%
		10 - 14	5.6%
		15 - 19	17.6%
		20 - 24	23.2%
		25 - 29	20.4%
		30 - 34	12.7%
		35 - 39	12.7%
		40 - 44	2.1%
		45 - 49	2.1%
		50 - 54	1.4%
		55 - 59	0.7%
		60 - 64	0.7%
		65 - 69	0.0%
		70 - 74	0.0%
		75 - 79	0.0%
		> 79	0.0%
		(Cases) N=	142
		mean	26
		min size (mm)	9
		max size (mm)	61
		<i>Pycnopodia helianthoides</i>	
< 20	0.0%		
20 - 39	4.8%		
40 - 59	14.3%		
60 - 79	23.8%		
80 - 99	4.8%		
100 - 119	4.8%		
120 - 139	4.8%		
140 - 159	19.0%		
160 - 179	4.8%		
180 - 199	4.8%		
200 - 219	4.8%		
220 - 239	9.5%		
240 - 259	0.0%		
260 - 279	0.0%		
280 - 299	0.0%		
> 299	0.0%		
(Cases) N=	21		
mean	119		
min size (mm)	37		
max size (mm)	230		

## San Miguel Island - Hare Rock

<i>Tethya aurantia</i>		<i>Asterina miniata</i>		<i>Pycnopodia helianthoides</i>	
<10	0.0%	<10	0.0%	< 20	8.3%
10 - 19	0.0%	10 - 19	1.7%	20 - 39	61.1%
20 - 29	0.0%	20 - 29	11.7%	40 - 59	5.6%
30 - 39	0.0%	30 - 39	5.0%	60 - 79	5.6%
40 - 49	0.0%	40 - 49	13.3%	80 - 99	0.0%
50 - 59	100.0%	50 - 59	30.0%	100 - 119	5.6%
60 - 69	0.0%	60 - 69	18.3%	120 - 139	5.6%
70 - 79	0.0%	70 - 79	18.3%	140 - 159	5.6%
80 - 89	0.0%	80 - 89	1.7%	160 - 179	2.8%
90 - 99	0.0%	90 - 99	0.0%	180 - 199	0.0%
> 99	0.0%	> 99	0.0%	200 - 219	0.0%
(Cases) N=	2	(Cases) N=	60	220 - 239	0.0%
mean	53	mean	54	240 - 259	0.0%
min size (mm)	52	min size (mm)	18	260 - 279	0.0%
max size (mm)	53	max size (mm)	85	280 - 299	0.0%
				> 299	0.0%
				(Cases) N=	36
				mean	50
				min size (mm)	15
				max size (mm)	166
<i>Kelletia kelletii</i>		<i>Pisaster giganteus</i>		<i>Strongylocentrotus franciscanus</i>	
< 40	0.0%	< 20	0.0%	< 5	0.0%
40 - 49	0.0%	20 - 39	4.1%	5 - 9	3.4%
50 - 59	0.0%	40 - 59	13.7%	10 - 14	10.1%
60 - 69	0.0%	60 - 79	24.7%	15 - 19	11.1%
70 - 79	0.0%	80 - 99	28.8%	20 - 24	14.0%
80 - 89	0.0%	100 - 119	26.0%	25 - 29	15.0%
90 - 99	0.0%	120 - 139	2.7%	30 - 34	5.8%
100 - 109	100.0%	140 - 159	0.0%	35 - 39	3.4%
110 - 119	0.0%	160 - 179	0.0%	40 - 44	2.4%
120 - 129	0.0%	180 - 199	0.0%	45 - 49	1.4%
130 - 139	0.0%	200 - 219	0.0%	50 - 54	0.5%
140 - 149	0.0%	220 - 239	0.0%	55 - 59	0.5%
> 149	0.0%	> 239	0.0%	60 - 64	1.4%
(Cases) N=	1	(Cases) N=	73	65 - 69	3.4%
mean	101	mean	83	70 - 74	3.9%
min size (mm)	101	min size (mm)	34	75 - 79	6.8%
max size (mm)	101	max size (mm)	122	80 - 84	7.7%
				85 - 89	4.8%
				90 - 94	2.9%
				95 - 99	1.0%
				100 - 104	0.5%
				105 - 109	0.0%
				> 109	0.0%
				(Cases) N=	207
				mean	42
				min size (mm)	6
				max size (mm)	102
<i>Lithopoma gibberosum</i>					
<10	0.0%				
10 - 19	0.0%				
20 - 29	100.0%				
30 - 39	0.0%				
40 - 49	0.0%				
50 - 59	0.0%				
60 - 69	0.0%				
70 - 79	0.0%				
80 - 89	0.0%				
90 - 99	0.0%				
100 - 109	0.0%				
110 - 119	0.0%				
> 119	0.0%				
(Cases) N=	1				
mean	29				
min size (mm)	29				

max size (mm)

29

## San Miguel Island - Hare Rock

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	5.2%
10 - 14	15.9%
15 - 19	26.7%
20 - 24	22.4%
25 - 29	14.7%
30 - 34	9.5%
35 - 39	4.7%
40 - 44	0.4%
45 - 49	0.4%
50 - 54	0.0%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	232
mean	21
min size (mm)	6
max size (mm)	48



<b>min size (mm)</b>	<b>50</b>
<b>max size (mm)</b>	<b>141</b>

2004 Natural Habitat Size Frequency Distributions  
Santa Rosa Island - Johnson's Lee North

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	12.2%
20 - 24	28.4%
25 - 29	14.9%
30 - 34	17.6%
35 - 39	8.1%
40 - 44	6.8%
45 - 49	9.5%
50 - 54	2.7%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	74
mean	30
min size (mm)	15
max size (mm)	52

## Santa Rosa Island - Johnson's Lee South

<i>Tethya aurantia</i>		<i>Kelletia kelletii</i>		<i>Crassedoma giganteum</i>	
<10	0.0%	< 40	0.0%	<10	0.0%
10 - 19	0.0%	40 - 49	0.0%	10 - 19	0.0%
20 - 29	0.0%	50 - 59	0.0%	20 - 29	0.0%
30 - 39	5.7%	60 - 69	0.0%	30 - 39	0.0%
40 - 49	5.7%	70 - 79	20.0%	40 - 49	0.0%
50 - 59	9.8%	80 - 89	0.0%	50 - 59	0.0%
60 - 69	13.8%	90 - 99	20.0%	60 - 69	0.0%
70 - 79	23.6%	100 - 109	20.0%	70 - 79	0.0%
80 - 89	18.7%	110 - 119	0.0%	80 - 89	0.0%
90 - 99	11.4%	120 - 129	40.0%	90 - 99	0.0%
> 99	11.4%	130 - 139	0.0%	100 - 109	0.0%
(Cases) N=	123	140 - 149	0.0%	110 - 119	0.0%
mean	75	> 149	0.0%	120 - 129	0.0%
min size (mm)	31	(Cases) N=	5	130 - 139	0.0%
max size (mm)	115	mean	103	> 139	100.0%
		min size (mm)	70	(Cases) N=	1
		max size (mm)	127	mean	147
				min size (mm)	147
				max size (mm)	147
<i>Haliotis rufescens</i>		<i>Megathura crenulata</i>		<i>Asterina miniata</i>	
<25	0.0%	<10	0.0%	<10	0.0%
25 - 34	0.0%	10 - 19	0.0%	10 - 19	0.0%
35 - 44	0.0%	20 - 29	0.0%	20 - 29	0.0%
45 - 54	0.0%	30 - 39	0.0%	30 - 39	9.8%
55 - 64	28.6%	40 - 49	0.0%	40 - 49	9.8%
65 - 74	28.6%	50 - 59	0.0%	50 - 59	13.1%
75 - 84	0.0%	60 - 69	0.0%	60 - 69	27.9%
85 - 94	0.0%	70 - 79	0.0%	70 - 79	31.1%
95 - 104	0.0%	80 - 89	0.0%	80 - 89	8.2%
105 - 114	0.0%	90 - 99	50.0%	90 - 99	0.0%
115 - 124	14.3%	100 - 109	50.0%	> 99	0.0%
125 - 134	0.0%	110 - 119	0.0%	(Cases) N=	61
135 - 144	0.0%	> 119	0.0%	mean	63
145 - 154	0.0%	(Cases) N=	2	mean	63
155 - 164	0.0%	mean	101	mean	63
165 - 174	0.0%	mean	101	min size (mm)	32
175 - 184	0.0%	min size (mm)	97	max size (mm)	85
185 - 194	0.0%	max size (mm)	104		
>195	28.6%				
(Cases) N=	7				
mean	113				
min size (mm)	55				
max size (mm)	217				

## Santa Rosa Island - Johnson's Lee South

<i>Pisaster giganteus</i>		<i>Strongylocentrotus franciscanus</i>	
< 20	0.0%	< 5	0.0%
20 - 39	0.0%	5 - 9	0.0%
40 - 59	26.0%	10 - 14	0.9%
60 - 79	44.0%	15 - 19	1.9%
80 - 99	6.0%	20 - 24	7.5%
100 - 119	8.0%	25 - 29	6.6%
120 - 139	4.0%	30 - 34	6.6%
140 - 159	8.0%	35 - 39	2.8%
160 - 179	2.0%	40 - 44	2.8%
180 - 199	2.0%	45 - 49	1.9%
200 - 219	0.0%	50 - 54	3.3%
220 - 239	0.0%	55 - 59	2.8%
> 239	0.0%	60 - 64	5.2%
(Cases) N=	50	65 - 69	1.9%
mean	82	70 - 74	6.1%
min size (mm)	46	75 - 79	6.1%
max size (mm)	187	80 - 84	10.4%
		85 - 89	11.8%
		90 - 94	9.9%
		95 - 99	6.6%
		100 - 104	1.4%
		105 - 109	2.8%
		> 109	0.5%
		(Cases) N=	212
		mean	65
		min size (mm)	11
		max size (mm)	111
		<i>Strongylocentrotus purpuratus</i>	
		< 5	0.0%
		5 - 9	0.7%
		10 - 14	6.8%
		15 - 19	12.2%
		20 - 24	18.4%
		25 - 29	13.6%
		30 - 34	13.6%
		35 - 39	11.6%
		40 - 44	14.3%
		45 - 49	4.8%
		50 - 54	2.0%
		55 - 59	1.4%
		60 - 64	0.7%
		65 - 69	0.0%
		70 - 74	0.0%
		75 - 79	0.0%
		> 79	0.0%
		(Cases) N=	147
		mean	30
		min size (mm)	9
		max size (mm)	63
<i>Pycnopodia helianthoides</i>			
< 20	0.0%		
20 - 39	0.0%		
40 - 59	0.0%		
60 - 79	1.3%		
80 - 99	1.3%		
100 - 119	9.3%		
120 - 139	22.7%		
140 - 159	16.0%		
160 - 179	16.0%		
180 - 199	10.7%		
200 - 219	4.0%		
220 - 239	8.0%		
240 - 259	6.7%		
260 - 279	2.7%		
280 - 299	0.0%		
> 299	1.3%		
(Cases) N=	75		
mean	165		
min size (mm)	70		
max size (mm)	300		



**min size (mm)**  
**max size (mm)**

**95**  
**114**

2004 Natural Habitat Size Frequency Distributions  
 Santa Rosa Island - Rodes Reef

*Strongylocentrotus franciscanus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	0.0%
20 - 24	0.7%
25 - 29	1.8%
30 - 34	1.1%
35 - 39	0.0%
40 - 44	1.1%
45 - 49	0.7%
50 - 54	1.1%
55 - 59	1.4%
60 - 64	3.9%
65 - 69	10.5%
70 - 74	16.5%
75 - 79	17.2%
80 - 84	21.4%
85 - 89	11.6%
90 - 94	7.0%
95 - 99	2.1%
100 - 104	1.1%
105 - 109	0.7%
> 109	0.4%
(Cases) N=	285
mean	76
min size (mm)	22
max size (mm)	110

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.0%
10 - 14	6.3%
15 - 19	7.9%
20 - 24	19.0%
25 - 29	38.1%
30 - 34	15.9%
35 - 39	9.5%
40 - 44	3.2%
45 - 49	0.0%
50 - 54	0.0%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	63
mean	26
min size (mm)	12
max size (mm)	42

## Santa Cruz Island - Gull Island South

<i>Tethya aurantia</i>		<i>Megathura crenulata</i>		<i>Asterina miniata</i>	
<10	0.0%	<10	0.0%	<10	0.0%
10 - 19	4.0%	10 - 19	0.0%	10 - 19	0.0%
20 - 29	36.0%	20 - 29	0.0%	20 - 29	0.0%
30 - 39	16.0%	30 - 39	0.0%	30 - 39	1.6%
40 - 49	20.0%	40 - 49	0.0%	40 - 49	8.8%
50 - 59	16.0%	50 - 59	0.0%	50 - 59	24.9%
60 - 69	4.0%	60 - 69	0.0%	60 - 69	31.6%
70 - 79	4.0%	70 - 79	0.0%	70 - 79	25.9%
80 - 89	0.0%	80 - 89	0.0%	80 - 89	6.2%
90 - 99	0.0%	90 - 99	100.0%	90 - 99	1.0%
> 99	0.0%	100 - 109	0.0%	> 99	0.0%
(Cases) N=	25	110 - 119	0.0%	(Cases) N=	193
mean	38	> 119	0.0%	mean	64
min size (mm)	19	(Cases) N=	1	min size (mm)	30
max size (mm)	72	mean	96	max size (mm)	96
		min size (mm)	96		
		max size (mm)	96		
<i>Kelletia kelletii</i>		<i>Crassedoma giganteum</i>		<i>Pisaster giganteus</i>	
< 40	0.0%	<10	0.0%	< 20	0.0%
40 - 49	0.0%	10 - 19	0.0%	20 - 39	0.0%
50 - 59	0.0%	20 - 29	0.0%	40 - 59	2.1%
60 - 69	0.0%	30 - 39	14.3%	60 - 79	0.0%
70 - 79	0.0%	40 - 49	14.3%	80 - 99	31.3%
80 - 89	20.0%	50 - 59	14.3%	100 - 119	39.6%
90 - 99	60.0%	60 - 69	0.0%	120 - 139	14.6%
100 - 109	20.0%	70 - 79	14.3%	140 - 159	6.3%
110 - 119	0.0%	80 - 89	0.0%	160 - 179	4.2%
120 - 129	0.0%	90 - 99	28.6%	180 - 199	0.0%
130 - 139	0.0%	100 - 109	0.0%	200 - 219	2.1%
140 - 149	0.0%	110 - 119	0.0%	220 - 239	0.0%
> 149	0.0%	120 - 129	14.3%	> 239	0.0%
(Cases) N=	5	130 - 139	0.0%	(Cases) N=	48
mean	96	> 139	0.0%	mean	113
min size (mm)	87	(Cases) N=	7	min size (mm)	44
max size (mm)	106	mean	73	max size (mm)	214
		min size (mm)	31		
		max size (mm)	122		
<i>Lithopoma gibberosum</i>					
<10	0.0%				
10 - 19	0.0%				
20 - 29	0.0%				
30 - 39	0.0%				
40 - 49	100.0%				
50 - 59	0.0%				
60 - 69	0.0%				
70 - 79	0.0%				
80 - 89	0.0%				
90 - 99	0.0%				
100 - 109	0.0%				
110 - 119	0.0%				
> 119	0.0%				
(Cases) N=	1				
mean	44				
min size (mm)	44				

max size (mm)

44

## Santa Cruz Island - Gull Island South

<i>Pycnopus helianthoides</i>		<i>Strongylocentrotus purpuratus</i>	
< 20	0.0%	< 5	0.0%
20 - 39	0.0%	5 - 9	0.0%
40 - 59	0.0%	10 - 14	0.0%
60 - 79	0.0%	15 - 19	2.9%
80 - 99	0.0%	20 - 24	8.6%
100 - 119	0.0%	25 - 29	8.6%
120 - 139	0.0%	30 - 34	40.0%
140 - 159	9.1%	35 - 39	14.3%
160 - 179	27.3%	40 - 44	8.6%
180 - 199	9.1%	45 - 49	5.7%
200 - 219	27.3%	50 - 54	8.6%
220 - 239	9.1%	55 - 59	2.9%
240 - 259	9.1%	60 - 64	0.0%
260 - 279	9.1%	65 - 69	0.0%
280 - 299	0.0%	70 - 74	0.0%
> 299	0.0%	75 - 79	0.0%
(Cases) N=	11	> 79	0.0%
mean	200	(Cases) N=	35
min size (mm)	154	mean	35
max size (mm)	270	min size (mm)	18
		max size (mm)	55

*Strongylocentrotus franciscanus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	0.0%
20 - 24	2.2%
25 - 29	7.5%
30 - 34	4.3%
35 - 39	6.5%
40 - 44	4.3%
45 - 49	2.2%
50 - 54	6.5%
55 - 59	1.1%
60 - 64	4.3%
65 - 69	4.3%
70 - 74	7.5%
75 - 79	3.2%
80 - 84	8.6%
85 - 89	9.7%
90 - 94	6.5%
95 - 99	7.5%
100 - 104	6.5%
105 - 109	2.2%
> 109	5.4%
(Cases) N=	93
mean	70
min size (mm)	20
max size (mm)	125



2004 Natural Habitat Size Frequency Distributions  
Santa Cruz Island - Fry's Harbor

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.0%
10 - 14	1.6%
15 - 19	6.3%
20 - 24	27.0%
25 - 29	42.9%
30 - 34	15.9%
35 - 39	4.8%
40 - 44	0.0%
45 - 49	0.0%
50 - 54	1.6%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	63
mean	27
min size (mm)	13
max size (mm)	51





<b>mean</b>	<b>69</b>
<b>min size (mm)</b>	<b>48</b>
<b>max size (mm)</b>	<b>92</b>

2004 Natural Habitat Size Frequency Distributions  
Santa Cruz Island - Scorpion Anchorage

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.4%
15 - 19	1.1%
20 - 24	20.2%
25 - 29	48.4%
30 - 34	24.3%
35 - 39	5.3%
40 - 44	0.4%
45 - 49	0.0%
50 - 54	0.0%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	568
mean	28
min size (mm)	10
max size (mm)	42

## Santa Cruz Island - Yellow Banks

<i>Tethya aurantia</i>		<i>Kelletia kelletii</i>		<i>Lithopoma gibberosum</i>	
<10	0.0%	< 40	0.0%	<10	0.0%
10 - 19	15.4%	40 - 49	0.0%	10 - 19	0.0%
20 - 29	0.0%	50 - 59	0.0%	20 - 29	0.0%
30 - 39	30.8%	60 - 69	0.0%	30 - 39	33.3%
40 - 49	15.4%	70 - 79	0.0%	40 - 49	0.0%
50 - 59	23.1%	80 - 89	11.8%	50 - 59	66.7%
60 - 69	7.7%	90 - 99	47.1%	60 - 69	0.0%
70 - 79	7.7%	100 - 109	17.6%	70 - 79	0.0%
80 - 89	0.0%	110 - 119	17.6%	80 - 89	0.0%
90 - 99	0.0%	120 - 129	5.9%	90 - 99	0.0%
> 99	0.0%	130 - 139	0.0%	100 - 109	0.0%
(Cases) N=	13	140 - 149	0.0%	110 - 119	0.0%
mean	43	> 149	0.0%	> 119	0.0%
min size (mm)	15	(Cases) N=	17	(Cases) N=	3
max size (mm)	71	mean	101	mean	46
		min size (mm)	85	min size (mm)	34
		max size (mm)	122	max size (mm)	55
<i>Haliotis rufescens</i>		<i>Lithopoma undosum</i>		<i>Megathura crenulata</i>	
<25	0.0%	<10	0.0%	<10	0.0%
25 - 34	0.0%	10 - 19	0.0%	10 - 19	0.0%
35 - 44	0.0%	20 - 29	1.4%	20 - 29	0.0%
45 - 54	0.0%	30 - 39	0.0%	30 - 39	0.0%
55 - 64	100.0%	40 - 49	1.4%	40 - 49	7.1%
65 - 74	0.0%	50 - 59	0.0%	50 - 59	14.3%
75 - 84	0.0%	60 - 69	0.0%	60 - 69	28.6%
85 - 94	0.0%	70 - 79	7.0%	70 - 79	21.4%
95 - 104	0.0%	80 - 89	46.5%	80 - 89	28.6%
105 - 114	0.0%	90 - 99	25.4%	90 - 99	0.0%
115 - 124	0.0%	100 - 109	5.6%	100 - 109	0.0%
125 - 134	0.0%	110 - 119	8.5%	110 - 119	0.0%
135 - 144	0.0%	> 119	4.2%	> 119	0.0%
145 - 154	0.0%	(Cases) N=	71	(Cases) N=	14
155 - 164	0.0%	mean	90	mean	70
165 - 174	0.0%	mean	90	mean	70
175 - 184	0.0%	min size (mm)	25	min size (mm)	45
185 - 194	0.0%	max size (mm)	126	max size (mm)	83
>195	0.0%				
(Cases) N=	1				
mean	63				
min size (mm)	63				
max size (mm)	63				
		<i>Asterina miniata</i>			
		<10	0.0%	<10	0.0%
		10 - 19	0.0%	10 - 19	0.0%
		20 - 29	18.6%	20 - 29	18.6%
		30 - 39	7.9%	30 - 39	7.9%
		40 - 49	3.6%	40 - 49	3.6%
		50 - 59	17.1%	50 - 59	17.1%
		60 - 69	19.3%	60 - 69	19.3%
		70 - 79	25.0%	70 - 79	25.0%
		80 - 89	6.4%	80 - 89	6.4%
		90 - 99	1.4%	90 - 99	1.4%
		> 99	0.7%	> 99	0.7%
		(Cases) N=	140	(Cases) N=	140
		mean	57	mean	57
		min size (mm)	22	min size (mm)	22



## Santa Cruz Island - Yellow Banks

<i>Pisaster giganteus</i>		<i>Lytechinus anamesus</i>		<i>Strongylocentrotus purpuratus</i>	
< 20	0.0%	< 5	0.0%	< 5	0.0%
20 - 39	0.0%	5 - 9	5.7%	5 - 9	1.3%
40 - 59	11.6%	10 - 14	47.1%	10 - 14	0.4%
60 - 79	39.5%	15 - 19	25.3%	15 - 19	15.0%
80 - 99	27.9%	20 - 24	19.0%	20 - 24	26.5%
100 - 119	7.0%	25 - 29	2.9%	25 - 29	34.2%
120 - 139	7.0%	30 - 34	0.0%	30 - 34	16.2%
140 - 159	4.7%	35 - 39	0.0%	35 - 39	4.3%
160 - 179	2.3%	40 - 44	0.0%	40 - 44	1.7%
180 - 199	0.0%	45 - 49	0.0%	45 - 49	0.0%
200 - 219	0.0%	> 49	0.0%	50 - 54	0.4%
220 - 239	0.0%	(Cases) N=	174	55 - 59	0.0%
> 239	0.0%	mean	15	60 - 64	0.0%
(Cases) N=	43	min size (mm)	6	65 - 69	0.0%
mean	85	max size (mm)	27	70 - 74	0.0%
min size (mm)	51			75 - 79	0.0%
max size (mm)	168			> 79	0.0%
		<i>Strongylocentrotus franciscanus</i>		(Cases) N=	234
				mean	26
				min size (mm)	6
				max size (mm)	54
<i>Pycnopodia helianthoides</i>					
< 20	0.0%	< 5	0.0%		
20 - 39	33.3%	5 - 9	0.0%		
40 - 59	0.0%	10 - 14	0.5%		
60 - 79	0.0%	15 - 19	2.2%		
80 - 99	0.0%	20 - 24	8.8%		
100 - 119	0.0%	25 - 29	12.1%		
120 - 139	0.0%	30 - 34	13.2%		
140 - 159	0.0%	35 - 39	8.2%		
160 - 179	0.0%	40 - 44	7.7%		
180 - 199	0.0%	45 - 49	3.8%		
200 - 219	0.0%	50 - 54	4.4%		
220 - 239	0.0%	55 - 59	3.3%		
240 - 259	33.3%	60 - 64	2.2%		
260 - 279	0.0%	65 - 69	1.1%		
280 - 299	33.3%	70 - 74	7.7%		
> 299	0.0%	75 - 79	4.9%		
(Cases) N=	3	80 - 84	6.0%		
mean	186	85 - 89	1.1%		
min size (mm)	20	90 - 94	4.9%		
max size (mm)	299	95 - 99	4.9%		
		100 - 104	0.5%		
		105 - 109	0.5%		
		> 109	1.6%		
		(Cases) N=	182		
		mean	52		
		min size (mm)	14		
		max size (mm)	116		

## Anacapa Island - Admiral's Reef

<i>Tethya aurantia</i>		<i>Megathura crenulata</i>		<i>Asterina miniata</i>	
<10	0.0%	<10	0.0%	<10	0.0%
10 - 19	0.0%	10 - 19	0.0%	10 - 19	0.0%
20 - 29	12.5%	20 - 29	0.0%	20 - 29	0.0%
30 - 39	12.5%	30 - 39	0.0%	30 - 39	4.8%
40 - 49	25.0%	40 - 49	0.0%	40 - 49	4.8%
50 - 59	18.8%	50 - 59	8.9%	50 - 59	23.8%
60 - 69	25.0%	60 - 69	35.6%	60 - 69	30.2%
70 - 79	6.3%	70 - 79	42.2%	70 - 79	23.8%
80 - 89	0.0%	80 - 89	13.3%	80 - 89	7.9%
90 - 99	0.0%	90 - 99	0.0%	90 - 99	4.8%
> 99	0.0%	100 - 109	0.0%	> 99	0.0%
(Cases) N=	16	110 - 119	0.0%	(Cases) N=	63
mean	49	> 119	0.0%	mean	65
min size (mm)	21	(Cases) N=	45	min size (mm)	33
max size (mm)	79	mean	70	max size (mm)	97
		min size (mm)	52		
		max size (mm)	86		
<i>Kelletia kelletii</i>		<i>Crassedoma giganteum</i>		<i>Pisaster giganteus</i>	
< 40	0.0%	<10	0.0%	< 20	0.0%
40 - 49	0.0%	10 - 19	0.0%	20 - 39	0.0%
50 - 59	0.0%	20 - 29	0.0%	40 - 59	0.0%
60 - 69	0.0%	30 - 39	0.0%	60 - 79	0.0%
70 - 79	0.0%	40 - 49	20.0%	80 - 99	0.0%
80 - 89	50.0%	50 - 59	30.0%	100 - 119	3.7%
90 - 99	50.0%	60 - 69	10.0%	120 - 139	18.5%
100 - 109	0.0%	70 - 79	0.0%	140 - 159	22.2%
110 - 119	0.0%	80 - 89	10.0%	160 - 179	11.1%
120 - 129	0.0%	90 - 99	20.0%	180 - 199	18.5%
130 - 139	0.0%	100 - 109	0.0%	200 - 219	14.8%
140 - 149	0.0%	110 - 119	10.0%	220 - 239	11.1%
> 149	0.0%	120 - 129	0.0%	> 239	0.0%
(Cases) N=	2	130 - 139	0.0%	(Cases) N=	27
mean	87	> 139	0.0%	mean	170
min size (mm)	82	(Cases) N=	10	min size (mm)	113
max size (mm)	92	mean	70	max size (mm)	225
		min size (mm)	41		
		max size (mm)	112		
<i>Lithopoma undosum</i>					
<10	0.0%				
10 - 19	0.0%				
20 - 29	0.0%				
30 - 39	0.0%				
40 - 49	0.0%				
50 - 59	0.0%				
60 - 69	50.0%				
70 - 79	16.7%				
80 - 89	16.7%				
90 - 99	16.7%				
100 - 109	0.0%				
110 - 119	0.0%				
> 119	0.0%				
(Cases) N=	6				
mean	75				
min size (mm)	60				

max size (mm)

98

## Anacapa Island - Admiral's Reef

*Strongylocentrotus franciscanus*

< 5	0.0%
5 - 9	0.5%
10 - 14	1.0%
15 - 19	1.5%
20 - 24	5.0%
25 - 29	8.5%
30 - 34	28.5%
35 - 39	21.5%
40 - 44	18.0%
45 - 49	8.5%
50 - 54	5.0%
55 - 59	1.5%
60 - 64	0.0%
65 - 69	0.5%
70 - 74	0.0%
75 - 79	0.0%
80 - 84	0.0%
85 - 89	0.0%
90 - 94	0.0%
95 - 99	0.0%
100 - 104	0.0%
105 - 109	0.0%
> 109	0.0%
(Cases) N=	200
mean	36
min size (mm)	9
max size (mm)	68

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.4%
10 - 14	0.9%
15 - 19	3.9%
20 - 24	25.9%
25 - 29	40.1%
30 - 34	24.1%
35 - 39	4.7%
40 - 44	0.0%
45 - 49	0.0%
50 - 54	0.0%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	232
mean	27
min size (mm)	7
max size (mm)	38









## Santa Barbara Island - Cat Canyon

<i>Lithopoma undosum</i>		<i>Crassedoma giganteum</i>		<i>Pisaster giganteus</i>	
<10	0.0%	<10	0.0%	< 20	0.0%
10 - 19	4.2%	10 - 19	0.0%	20 - 39	0.0%
20 - 29	2.1%	20 - 29	0.0%	40 - 59	5.3%
30 - 39	21.1%	30 - 39	0.0%	60 - 79	13.2%
40 - 49	29.5%	40 - 49	0.0%	80 - 99	10.5%
50 - 59	17.9%	50 - 59	12.5%	100 - 119	52.6%
60 - 69	10.5%	60 - 69	12.5%	120 - 139	13.2%
70 - 79	5.3%	70 - 79	37.5%	140 - 159	2.6%
80 - 89	7.4%	80 - 89	0.0%	160 - 179	2.6%
90 - 99	2.1%	90 - 99	12.5%	180 - 199	0.0%
100 - 109	0.0%	100 - 109	12.5%	200 - 219	0.0%
110 - 119	0.0%	110 - 119	12.5%	220 - 239	0.0%
> 119	0.0%	120 - 129	0.0%	> 239	0.0%
(Cases) N=	95	130 - 139	0.0%	(Cases) N=	38
mean	50	> 139	0.0%	mean	103
min size (mm)	13	(Cases) N=	8	min size (mm)	40
max size (mm)	95	mean	83	max size (mm)	162
		min size (mm)	59		
		max size (mm)	115		
<i>Megathura crenulata</i>		<i>Asterina miniata</i>		<i>Strongylocentrotus franciscanus</i>	
<10	0.0%	<10	0.0%	< 5	0.0%
10 - 19	0.0%	10 - 19	1.3%	5 - 9	0.0%
20 - 29	33.3%	20 - 29	8.0%	10 - 14	0.0%
30 - 39	0.0%	30 - 39	13.3%	15 - 19	2.1%
40 - 49	66.7%	40 - 49	17.3%	20 - 24	13.2%
50 - 59	0.0%	50 - 59	28.0%	25 - 29	17.9%
60 - 69	0.0%	60 - 69	18.7%	30 - 34	26.8%
70 - 79	0.0%	70 - 79	9.3%	35 - 39	9.5%
80 - 89	0.0%	80 - 89	1.3%	40 - 44	2.1%
90 - 99	0.0%	90 - 99	2.7%	45 - 49	0.5%
100 - 109	0.0%	> 99	0.0%	50 - 54	0.5%
110 - 119	0.0%	(Cases) N=	75	55 - 59	1.6%
> 119	0.0%	mean	52	60 - 64	2.1%
(Cases) N=	3	min size (mm)	19	65 - 69	3.2%
mean	39	max size (mm)	97	70 - 74	7.4%
min size (mm)	20			75 - 79	7.4%
max size (mm)	49			80 - 84	4.2%
				85 - 89	1.1%
				90 - 94	0.5%
				95 - 99	0.0%
				100 - 104	0.0%
				105 - 109	0.0%
				> 109	0.0%
				(Cases) N=	190
				mean	42
				min size (mm)	18
				max size (mm)	93

2004 Natural Habitat Size Frequency Distributions  
Santa Barbara Island - Cat Canyon

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	1.4%
10 - 14	2.9%
15 - 19	9.6%
20 - 24	43.3%
25 - 29	34.6%
30 - 34	7.2%
35 - 39	0.5%
40 - 44	0.5%
45 - 49	0.0%
50 - 54	0.0%
55 - 59	0.0%
60 - 64	0.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	208
mean	24
min size (mm)	5
max size (mm)	41



## San Clemente Island - Northwest Harbor

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	0.0%
20 - 24	0.0%
25 - 29	1.8%
30 - 34	8.0%
35 - 39	11.5%
40 - 44	16.8%
45 - 49	21.2%
50 - 54	21.2%
55 - 59	8.0%
60 - 64	8.8%
65 - 69	2.7%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	113
mean	47
min size (mm)	26
max size (mm)	69

*Centrostephanus coronatus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	0.0%
20 - 24	0.0%
25 - 29	0.0%
30 - 34	0.0%
35 - 39	0.0%
40 - 44	0.0%
45 - 49	0.0%
50 - 54	0.0%
55 - 59	50.0%
60 - 64	50.0%
65 - 69	0.0%
70 - 74	0.0%
75 - 79	0.0%
> 79	0.0%
(Cases) N=	2
mean	62
min size (mm)	59
max size (mm)	64

## San Clemente Island - Boy Scout Camp

<i>Haliotis corrugata</i>		<i>Strongylocentrotus franciscanus</i>		<i>Centrostephanus coronatus</i>	
<25	0.0%	< 5	0.0%	< 5	0.0%
25 - 34	0.0%	5 - 9	0.0%	5 - 9	0.0%
35 - 44	0.0%	10 - 14	0.0%	10 - 14	0.0%
45 - 54	0.0%	15 - 19	0.0%	15 - 19	0.0%
55 - 64	0.0%	20 - 24	0.0%	20 - 24	0.0%
65 - 74	0.0%	25 - 29	0.0%	25 - 29	0.0%
75 - 84	0.0%	30 - 34	0.0%	30 - 34	0.0%
85 - 94	0.0%	35 - 39	0.0%	35 - 39	0.0%
95 - 104	0.0%	40 - 44	0.0%	40 - 44	0.0%
105 - 114	0.0%	45 - 49	0.9%	45 - 49	0.0%
115 - 124	9.1%	50 - 54	0.0%	50 - 54	7.7%
125 - 134	0.0%	55 - 59	1.7%	55 - 59	30.8%
135 - 144	0.0%	60 - 64	7.8%	60 - 64	23.1%
145 - 154	27.3%	65 - 69	5.2%	65 - 69	15.4%
155 - 164	36.4%	70 - 74	6.1%	70 - 74	15.4%
165 - 174	27.3%	75 - 79	5.2%	75 - 79	0.0%
175 - 184	0.0%	80 - 84	8.7%	> 79	7.7%
185 - 194	0.0%	85 - 89	7.8%	(Cases) N=	13
>195	0.0%	90 - 94	16.5%	mean	64
(Cases) N=	11	95 - 99	12.2%	min size (mm)	50
mean	156	100 - 104	13.0%	max size (mm)	82
min size (mm)	121	105 - 109	4.3%		
max size (mm)	173	> 109	10.4%		
		(Cases) N=	115		
		mean	89		
		min size (mm)	49		
		max size (mm)	118		
<i>Lithopoma undosum</i>		<i>Strongylocentrotus purpuratus</i>			
<10	0.0%	< 5	0.0%		
10 - 19	0.0%	5 - 9	0.0%		
20 - 29	0.0%	10 - 14	0.0%		
30 - 39	0.0%	15 - 19	0.0%		
40 - 49	0.0%	20 - 24	0.0%		
50 - 59	0.0%	25 - 29	0.0%		
60 - 69	12.5%	30 - 34	25.0%		
70 - 79	0.0%	35 - 39	0.0%		
80 - 89	12.5%	40 - 44	50.0%		
90 - 99	0.0%	45 - 49	0.0%		
100 - 109	12.5%	50 - 54	0.0%		
110 - 119	50.0%	55 - 59	0.0%		
> 119	12.5%	60 - 64	25.0%		
(Cases) N=	8	65 - 69	0.0%		
mean	105	70 - 74	0.0%		
min size (mm)	67	75 - 79	0.0%		
max size (mm)	127	> 79	0.0%		
		(Cases) N=	4		
		mean	44		
		min size (mm)	30		
		max size (mm)	62		

## San Clemente Island - Eel Point

<i>Haliotis corrugata</i>		<i>Kelletia kelletii</i>		<i>Megathura crenulata</i>	
<25	0.0%	< 40	0.0%	<10	0.0%
25 - 34	0.0%	40 - 49	0.0%	10 - 19	0.0%
35 - 44	0.0%	50 - 59	0.0%	20 - 29	0.0%
45 - 54	0.0%	60 - 69	0.0%	30 - 39	0.0%
55 - 64	0.0%	70 - 79	0.0%	40 - 49	0.0%
65 - 74	0.0%	80 - 89	0.0%	50 - 59	0.0%
75 - 84	0.0%	90 - 99	0.0%	60 - 69	0.0%
85 - 94	50.0%	100 - 109	34.6%	70 - 79	0.0%
95 - 104	0.0%	110 - 119	57.7%	80 - 89	20.0%
105 - 114	0.0%	120 - 129	7.7%	90 - 99	10.0%
115 - 124	50.0%	130 - 139	0.0%	100 - 109	10.0%
125 - 134	0.0%	140 - 149	0.0%	110 - 119	20.0%
135 - 144	0.0%	> 149	0.0%	> 119	40.0%
145 - 154	0.0%	(Cases) N=	26	(Cases) N=	10
155 - 164	0.0%	mean	111	mean	117
165 - 174	0.0%	mean	111	mean	117
175 - 184	0.0%	min size (mm)	100	min size (mm)	84
185 - 194	0.0%	max size (mm)	128	max size (mm)	146
>195	0.0%				
(Cases) N=	2	<i>Lithopoma undosum</i>		<i>Pisaster giganteus</i>	
mean	108	<10	0.0%	< 20	0.0%
min size (mm)	94	10 - 19	0.0%	20 - 39	0.0%
max size (mm)	122	20 - 29	0.0%	40 - 59	0.0%
		30 - 39	0.0%	60 - 79	8.1%
<i>Haliotis fulgens</i>		40 - 49	0.0%	80 - 99	51.4%
<25	0.0%	50 - 59	0.0%	100 - 119	29.7%
25 - 34	0.0%	60 - 69	2.2%	120 - 139	10.8%
35 - 44	0.0%	70 - 79	6.7%	140 - 159	0.0%
45 - 54	0.0%	80 - 89	33.3%	160 - 179	0.0%
55 - 64	0.0%	90 - 99	40.0%	180 - 199	0.0%
65 - 74	0.0%	100 - 109	17.8%	200 - 219	0.0%
75 - 84	0.0%	110 - 119	0.0%	220 - 239	0.0%
85 - 94	0.0%	> 119	0.0%	> 239	0.0%
95 - 104	0.0%	(Cases) N=	45	(Cases) N=	37
105 - 114	0.0%	mean	91	mean	98
115 - 124	0.0%	mean	91	mean	98
125 - 134	50.0%	min size (mm)	67	min size (mm)	74
135 - 144	0.0%	max size (mm)	104	max size (mm)	128
145 - 154	50.0%				
155 - 164	0.0%				
165 - 174	0.0%				
175 - 184	0.0%				
185 - 194	0.0%				
>195	0.0%				
(Cases) N=	2				
mean	135				
min size (mm)	125				
max size (mm)	145				

2004 Natural Habitat Size Frequency Distributions  
 San Clemente Island - Eel Point

*Strongylocentrotus franciscanus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	0.0%
20 - 24	0.0%
25 - 29	0.0%
30 - 34	0.0%
35 - 39	0.0%
40 - 44	1.0%
45 - 49	0.0%
50 - 54	0.5%
55 - 59	0.5%
60 - 64	0.5%
65 - 69	1.6%
70 - 74	5.8%
75 - 79	6.8%
80 - 84	14.7%
85 - 89	11.5%
90 - 94	15.2%
95 - 99	7.9%
100 - 104	16.8%
105 - 109	5.2%
> 109	12.0%
(Cases) N=	191
mean	92
min size (mm)	42
max size (mm)	128

*Strongylocentrotus purpuratus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.0%
15 - 19	0.0%
20 - 24	3.7%
25 - 29	6.6%
30 - 34	11.0%
35 - 39	9.6%
40 - 44	24.3%
45 - 49	14.7%
50 - 54	11.8%
55 - 59	9.6%
60 - 64	5.1%
65 - 69	0.7%
70 - 74	2.2%
75 - 79	0.0%
> 79	0.7%
(Cases) N=	136
mean	44
min size (mm)	20
max size (mm)	98

## San Clemente Island - Horse Beach Cove

<i>Tethya aurantia</i>		<i>Kelletia kelletii</i>		<i>Megathura crenulata</i>	
<10	0.0%	< 40	0.0%	<10	0.0%
10 - 19	0.0%	40 - 49	0.0%	10 - 19	0.0%
20 - 29	0.0%	50 - 59	0.0%	20 - 29	0.0%
30 - 39	0.0%	60 - 69	0.0%	30 - 39	0.0%
40 - 49	57.1%	70 - 79	0.0%	40 - 49	0.0%
50 - 59	14.3%	80 - 89	0.0%	50 - 59	0.0%
60 - 69	14.3%	90 - 99	0.0%	60 - 69	15.8%
70 - 79	0.0%	100 - 109	10.0%	70 - 79	10.5%
80 - 89	0.0%	110 - 119	10.0%	80 - 89	31.6%
90 - 99	0.0%	120 - 129	50.0%	90 - 99	26.3%
> 99	14.3%	130 - 139	30.0%	100 - 109	15.8%
(Cases) N=	7	140 - 149	0.0%	110 - 119	0.0%
mean	58	> 149	0.0%	> 119	0.0%
min size (mm)	41	(Cases) N=	10	(Cases) N=	19
max size (mm)	100	mean	126	mean	87
		min size (mm)	108	min size (mm)	65
		max size (mm)	136	max size (mm)	104
<i>Haliotis corrugata</i>		<i>Lithopoma undosum</i>		<i>Crassedoma giganteum</i>	
<25	0.0%	<10	0.0%	<10	0.0%
25 - 34	0.0%	10 - 19	0.0%	10 - 19	0.0%
35 - 44	0.0%	20 - 29	0.0%	20 - 29	0.0%
45 - 54	0.0%	30 - 39	0.0%	30 - 39	0.0%
55 - 64	0.0%	40 - 49	0.0%	40 - 49	25.0%
65 - 74	0.0%	50 - 59	0.0%	50 - 59	25.0%
75 - 84	0.0%	60 - 69	6.5%	60 - 69	25.0%
85 - 94	16.7%	70 - 79	12.9%	70 - 79	25.0%
95 - 104	0.0%	80 - 89	32.3%	80 - 89	0.0%
105 - 114	0.0%	90 - 99	32.3%	90 - 99	0.0%
115 - 124	0.0%	100 - 109	16.1%	100 - 109	0.0%
125 - 134	16.7%	110 - 119	0.0%	110 - 119	0.0%
135 - 144	0.0%	> 119	0.0%	120 - 129	0.0%
145 - 154	33.3%	(Cases) N=	31	130 - 139	0.0%
155 - 164	16.7%	mean	89	> 139	0.0%
165 - 174	0.0%	mean	89	> 139	0.0%
175 - 184	0.0%	min size (mm)	65	(Cases) N=	4
185 - 194	16.7%	max size (mm)	107	mean	63
>195	0.0%			min size (mm)	46
(Cases) N=	6			max size (mm)	78
mean	148				
min size (mm)	94				
max size (mm)	194				

2004 Natural Habitat Size Frequency Distributions

San Clemente Island - Horse Beach Cove

<i>Pisaster giganteus</i>		<i>Strongylocentrotus purpuratus</i>	
< 20	0.0%	< 5	0.0%
20 - 39	0.0%	5 - 9	0.0%
40 - 59	0.0%	10 - 14	0.0%
60 - 79	6.3%	15 - 19	0.0%
80 - 99	6.3%	20 - 24	0.0%
100 - 119	43.8%	25 - 29	0.0%
120 - 139	25.0%	30 - 34	0.0%
140 - 159	18.8%	35 - 39	16.0%
160 - 179	0.0%	40 - 44	12.0%
180 - 199	0.0%	45 - 49	20.0%
200 - 219	0.0%	50 - 54	24.0%
220 - 239	0.0%	55 - 59	12.0%
> 239	0.0%	60 - 64	8.0%
(Cases) N=	16	65 - 69	8.0%
mean	116	70 - 74	0.0%
min size (mm)	77	75 - 79	0.0%
max size (mm)	148	> 79	0.0%
		(Cases) N=	25
		mean	49
		min size (mm)	35
		max size (mm)	65
<i>Strongylocentrotus franciscanus</i>			
< 5	0.0%		
5 - 9	0.0%		
10 - 14	0.0%		
15 - 19	0.9%		
20 - 24	0.0%		
25 - 29	0.0%		
30 - 34	0.0%		
35 - 39	0.0%		
40 - 44	0.0%		
45 - 49	0.9%		
50 - 54	1.8%		
55 - 59	0.0%		
60 - 64	0.0%		
65 - 69	2.7%		
70 - 74	7.2%		
75 - 79	6.3%		
80 - 84	11.7%		
85 - 89	14.4%		
90 - 94	10.8%		
95 - 99	14.4%		
100 - 104	15.3%		
105 - 109	7.2%		
> 109	6.3%		
(Cases) N=	111		
mean	90		
min size (mm)	18		
max size (mm)	122		

## San Miguel Island - Miracle Mile

<i>Haliotis rufescens</i>		<i>Strongylocentrotus purpuratus</i>	
<25	0.0%	< 5	0.0%
25 - 34	0.0%	5 - 9	0.0%
35 - 44	0.0%	10 - 14	0.0%
45 - 54	0.0%	15 - 19	5.6%
55 - 64	0.0%	20 - 24	16.7%
65 - 74	0.8%	25 - 29	11.1%
75 - 84	0.8%	30 - 34	11.1%
85 - 94	0.0%	35 - 39	11.1%
95 - 104	2.4%	40 - 44	0.0%
105 - 114	3.3%	45 - 49	11.1%
115 - 124	0.0%	50 - 54	5.6%
125 - 134	0.8%	55 - 59	22.2%
135 - 144	1.6%	60 - 64	5.6%
145 - 154	4.9%	65 - 69	0.0%
155 - 164	5.7%	70 - 74	0.0%
165 - 174	17.1%	75 - 79	0.0%
175 - 184	21.1%	> 79	0.0%
185 - 194	19.5%	(Cases) N=	18
>195	22.0%	mean	39
(Cases) N=	123	min size (mm)	16
mean	176	max size (mm)	62
min size (mm)	65		
max size (mm)	215		

*Strongylocentrotus franciscanus*

< 5	0.0%
5 - 9	0.0%
10 - 14	0.5%
15 - 19	1.0%
20 - 24	1.5%
25 - 29	2.0%
30 - 34	2.0%
35 - 39	0.5%
40 - 44	0.5%
45 - 49	0.5%
50 - 54	2.0%
55 - 59	2.5%
60 - 64	3.4%
65 - 69	5.9%
70 - 74	8.8%
75 - 79	11.3%
80 - 84	20.6%
85 - 89	12.7%
90 - 94	10.8%
95 - 99	6.9%
100 - 104	2.9%
105 - 109	1.5%
> 109	2.5%
(Cases) N=	204
mean	78
min size (mm)	14
max size (mm)	121



# Appendix H: *Macrocystis pyrifera* Size Frequency Distributions

## 2004 *Macrocystis pyrifera* Size Frequency Distributions San Miguel Island - Wyckoff Ledge

*Macrocystis pyrifera* Ad.(>1m) number of stipes *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	3.9%	< 6	0.0%
3 - 5	4.9%	6 - 11	3.9%
6 - 8	4.9%	12 - 17	12.7%
9 - 11	2.9%	18 - 23	29.4%
12 - 14	20.6%	24 - 29	15.7%
15 - 17	15.7%	30 - 35	14.7%
18 - 20	7.8%	36 - 41	12.7%
21 - 23	10.8%	42 - 47	3.9%
24 - 26	4.9%	48 - 53	3.9%
27 - 29	5.9%	54 - 59	2.0%
30 - 32	5.9%	60 - 65	0.0%
33 - 35	3.9%	66 - 71	0.0%
36 - 38	2.9%	72 - 77	1.0%
39 - 41	1.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	3.9%	> 89	0.0%
<b>(Cases) N=</b>	<b>102</b>	<b>(Cases) N=</b>	<b>102</b>
<b>mean</b>	<b>19</b>	<b>mean</b>	<b>28</b>
<b>min number</b>	<b>2</b>	<b>min width (cm)</b>	<b>7</b>
<b>max number</b>	<b>59</b>	<b>max width (cm)</b>	<b>72</b>

2004 *Macrocystis pyrifera* Size Frequency Distributions  
San Miguel Island - Hare Rock

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	3.3%	< 6	1.3%
3 - 5	27.0%	6 - 11	28.9%
6 - 8	30.3%	12 - 17	40.8%
9 - 11	15.8%	18 - 23	15.1%
12 - 14	9.2%	24 - 29	6.6%
15 - 17	2.6%	30 - 35	0.7%
18 - 20	2.6%	36 - 41	2.0%
21 - 23	2.6%	42 - 47	2.0%
24 - 26	2.0%	48 - 53	2.0%
27 - 29	2.0%	54 - 59	0.7%
30 - 32	2.0%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.7%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
<b>(Cases) N=</b>	<b>152</b>	<b>(Cases) N=</b>	<b>152</b>
mean	9	mean	16
min number	2	min width (cm)	3
max number	39	max width (cm)	56

Santa Rosa Island - Johnson's Lee North

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	9.0%	< 6	1.0%
3 - 5	10.0%	6 - 11	4.0%
6 - 8	19.0%	12 - 17	2.0%
9 - 11	27.0%	18 - 23	8.0%
12 - 14	12.0%	24 - 29	1.0%
15 - 17	9.0%	30 - 35	13.0%
18 - 20	5.0%	36 - 41	16.0%
21 - 23	5.0%	42 - 47	19.0%
24 - 26	2.0%	48 - 53	15.0%
27 - 29	1.0%	54 - 59	13.0%
30 - 32	0.0%	60 - 65	5.0%
33 - 35	0.0%	66 - 71	3.0%
36 - 38	1.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
<b>(Cases) N=</b>	<b>100</b>	<b>(Cases) N=</b>	<b>100</b>
mean	11	mean	42
min number	1	min width (cm)	3
max number	36	max width (cm)	70

2004 *Macrocystis pyrifera* Size Frequency Distributions  
Santa Rosa Island - Johnson's Lee South

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	6.7%	< 6	2.2%
3 - 5	5.6%	6 - 11	2.2%
6 - 8	11.2%	12 - 17	4.5%
9 - 11	15.7%	18 - 23	0.0%
12 - 14	16.9%	24 - 29	3.4%
15 - 17	16.9%	30 - 35	5.6%
18 - 20	6.7%	36 - 41	6.7%
21 - 23	5.6%	42 - 47	24.7%
24 - 26	6.7%	48 - 53	14.6%
27 - 29	2.2%	54 - 59	19.1%
30 - 32	1.1%	60 - 65	9.0%
33 - 35	2.2%	66 - 71	4.5%
36 - 38	0.0%	72 - 77	2.2%
39 - 41	0.0%	78 - 83	1.1%
42 - 44	1.1%	84 - 89	0.0%
> 44	1.1%	> 89	0.0%
(Cases) N=	89	(Cases) N=	89
mean	15	mean	47
min number	1	min width (cm)	5
max number	50	max width (cm)	78

Santa Rosa Island - Rodes Reef

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	3.0%	< 6	2.2%
3 - 5	5.2%	6 - 11	7.4%
6 - 8	5.9%	12 - 17	14.8%
9 - 11	11.1%	18 - 23	14.1%
12 - 14	10.4%	24 - 29	21.5%
15 - 17	14.8%	30 - 35	20.7%
18 - 20	13.3%	36 - 41	9.6%
21 - 23	16.3%	42 - 47	7.4%
24 - 26	7.4%	48 - 53	1.5%
27 - 29	4.4%	54 - 59	0.0%
30 - 32	3.7%	60 - 65	0.7%
33 - 35	3.7%	66 - 71	0.0%
36 - 38	0.7%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	135	(Cases) N=	135
mean	17	mean	26
min number	2	min width (cm)	4
max number	38	max width (cm)	60

2004 *Macrocystis pyrifera* Size Frequency Distributions  
Santa Cruz Island - Gull Island South

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	30.0%	< 6	17.3%
3 - 5	6.4%	6 - 11	11.8%
6 - 8	2.7%	12 - 17	5.5%
9 - 11	4.5%	18 - 23	0.0%
12 - 14	10.0%	24 - 29	4.5%
15 - 17	10.0%	30 - 35	15.5%
18 - 20	7.3%	36 - 41	6.4%
21 - 23	10.0%	42 - 47	10.9%
24 - 26	6.4%	48 - 53	17.3%
27 - 29	8.2%	54 - 59	6.4%
30 - 32	1.8%	60 - 65	1.8%
33 - 35	0.9%	66 - 71	1.8%
36 - 38	0.9%	72 - 77	0.9%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.9%	> 89	0.0%
(Cases) N=	110	(Cases) N=	110
mean	13	mean	31
min number	1	min width (cm)	1
max number	46	max width (cm)	75

Santa Cruz Island - Fry's Harbor

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	50.0%	< 6	0.0%
3 - 5	50.0%	6 - 11	100.0%
6 - 8	0.0%	12 - 17	0.0%
9 - 11	0.0%	18 - 23	0.0%
12 - 14	0.0%	24 - 29	0.0%
15 - 17	0.0%	30 - 35	0.0%
18 - 20	0.0%	36 - 41	0.0%
21 - 23	0.0%	42 - 47	0.0%
24 - 26	0.0%	48 - 53	0.0%
27 - 29	0.0%	54 - 59	0.0%
30 - 32	0.0%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	2	(Cases) N=	2
mean	3	mean	11
min number	2	min width (cm)	11
max number	3	max width (cm)	11

2004 *Macrocystis pyrifera* Size Frequency Distributions  
Santa Cruz Island - Scorpion Anchorage

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	0.0%	< 6	0.0%
3 - 5	0.0%	6 - 11	0.0%
6 - 8	100.0%	12 - 17	0.0%
9 - 11	0.0%	18 - 23	100.0%
12 - 14	0.0%	24 - 29	0.0%
15 - 17	0.0%	30 - 35	0.0%
18 - 20	0.0%	36 - 41	0.0%
21 - 23	0.0%	42 - 47	0.0%
24 - 26	0.0%	48 - 53	0.0%
27 - 29	0.0%	54 - 59	0.0%
30 - 32	0.0%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	1	(Cases) N=	1
mean	6	mean	23
min number	6	min width (cm)	23
max number	6	max width (cm)	23

Santa Cruz Island - Yellow Banks

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	0.0%	< 6	0.0%
3 - 5	7.2%	6 - 11	2.0%
6 - 8	11.1%	12 - 17	9.8%
9 - 11	28.1%	18 - 23	22.9%
12 - 14	27.5%	24 - 29	25.5%
15 - 17	9.8%	30 - 35	17.6%
18 - 20	7.8%	36 - 41	16.3%
21 - 23	3.3%	42 - 47	3.3%
24 - 26	1.3%	48 - 53	2.0%
27 - 29	3.3%	54 - 59	0.7%
30 - 32	0.7%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	153	(Cases) N=	153
mean	13	mean	28
min number	3	min width (cm)	10
max number	31	max width (cm)	54

2004 *Macrocystis pyrifera* Size Frequency Distributions  
Anacapa Island - Admiral's Reef

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	100.0%	< 6	13.3%
3 - 5	0.0%	6 - 11	73.3%
6 - 8	0.0%	12 - 17	13.3%
9 - 11	0.0%	18 - 23	0.0%
12 - 14	0.0%	24 - 29	0.0%
15 - 17	0.0%	30 - 35	0.0%
18 - 20	0.0%	36 - 41	0.0%
21 - 23	0.0%	42 - 47	0.0%
24 - 26	0.0%	48 - 53	0.0%
27 - 29	0.0%	54 - 59	0.0%
30 - 32	0.0%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	15	(Cases) N=	15
mean	1	mean	8
min number	1	min width (cm)	5
max number	2	max width (cm)	12

Anacapa Island - Cathedral Cove

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	29.3%	< 6	1.0%
3 - 5	44.4%	6 - 11	34.3%
6 - 8	15.2%	12 - 17	46.5%
9 - 11	4.0%	18 - 23	9.1%
12 - 14	4.0%	24 - 29	5.1%
15 - 17	2.0%	30 - 35	3.0%
18 - 20	0.0%	36 - 41	1.0%
21 - 23	1.0%	42 - 47	0.0%
24 - 26	0.0%	48 - 53	0.0%
27 - 29	0.0%	54 - 59	0.0%
30 - 32	0.0%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	99	(Cases) N=	99
mean	5	mean	14
min number	1	min width (cm)	5
max number	22	max width (cm)	36

2004 *Macrocystis pyrifera* Size Frequency Distributions  
Anacapa Island - Landing Cove

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	72.1%	< 6	17.2%
3 - 5	12.3%	6 - 11	55.7%
6 - 8	4.9%	12 - 17	10.7%
9 - 11	0.8%	18 - 23	5.7%
12 - 14	4.9%	24 - 29	7.4%
15 - 17	0.8%	30 - 35	1.6%
18 - 20	1.6%	36 - 41	0.0%
21 - 23	0.8%	42 - 47	1.6%
24 - 26	0.0%	48 - 53	0.0%
27 - 29	0.0%	54 - 59	0.0%
30 - 32	0.8%	60 - 65	0.0%
33 - 35	0.8%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	122	(Cases) N=	122
mean	4	mean	11
min number	1	min width (cm)	2
max number	34	max width (cm)	45

Santa Barbara Island - Cat Canyon

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	19.0%	< 6	14.3%
3 - 5	19.0%	6 - 11	19.0%
6 - 8	4.8%	12 - 17	33.3%
9 - 11	23.8%	18 - 23	19.0%
12 - 14	9.5%	24 - 29	14.3%
15 - 17	14.3%	30 - 35	0.0%
18 - 20	0.0%	36 - 41	0.0%
21 - 23	0.0%	42 - 47	0.0%
24 - 26	4.8%	48 - 53	0.0%
27 - 29	0.0%	54 - 59	0.0%
30 - 32	0.0%	60 - 65	0.0%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	4.8%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	21	(Cases) N=	21
mean	10	mean	15
min number	1	min width (cm)	3
max number	40	max width (cm)	29

2004 *Macrocystis pyrifera* Size Frequency Distributions  
San Clemente Island - Northwest Harbor

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	33.3%	< 6	35.0%
3 - 5	7.3%	6 - 11	1.6%
6 - 8	4.9%	12 - 17	2.4%
9 - 11	6.5%	18 - 23	2.4%
12 - 14	7.3%	24 - 29	4.1%
15 - 17	9.8%	30 - 35	18.7%
18 - 20	9.8%	36 - 41	12.2%
21 - 23	8.1%	42 - 47	16.3%
24 - 26	7.3%	48 - 53	5.7%
27 - 29	3.3%	54 - 59	0.8%
30 - 32	1.6%	60 - 65	0.8%
33 - 35	0.0%	66 - 71	0.0%
36 - 38	0.0%	72 - 77	0.0%
39 - 41	0.8%	78 - 83	0.0%
42 - 44	0.0%	84 - 89	0.0%
> 44	0.0%	> 89	0.0%
(Cases) N=	123	(Cases) N=	123
mean	12	mean	25
min number	1	min width (cm)	1
max number	39	max width (cm)	60

San Clemente Island - Boy Scout Camp

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	17.5%	< 6	7.5%
3 - 5	24.2%	6 - 11	14.2%
6 - 8	10.8%	12 - 17	16.7%
9 - 11	11.7%	18 - 23	14.2%
12 - 14	11.7%	24 - 29	21.7%
15 - 17	5.0%	30 - 35	12.5%
18 - 20	5.0%	36 - 41	2.5%
21 - 23	2.5%	42 - 47	0.0%
24 - 26	1.7%	48 - 53	1.7%
27 - 29	2.5%	54 - 59	0.8%
30 - 32	0.0%	60 - 65	0.8%
33 - 35	0.0%	66 - 71	0.8%
36 - 38	0.8%	72 - 77	0.0%
39 - 41	3.3%	78 - 83	3.3%
42 - 44	1.7%	84 - 89	2.5%
> 44	1.7%	> 89	0.8%
(Cases) N=	120	(Cases) N=	120
mean	11	mean	26
min number	1	min width (cm)	2
max number	66	max width (cm)	90

2004 *Macrocystis pyrifera* Size Frequency Distributions  
San Clemente Island - Eel Point

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	3.5%	< 6	0.9%
3 - 5	8.8%	6 - 11	0.0%
6 - 8	8.8%	12 - 17	2.7%
9 - 11	7.1%	18 - 23	9.7%
12 - 14	19.5%	24 - 29	18.6%
15 - 17	14.2%	30 - 35	24.8%
18 - 20	12.4%	36 - 41	15.9%
21 - 23	12.4%	42 - 47	14.2%
24 - 26	2.7%	48 - 53	6.2%
27 - 29	3.5%	54 - 59	5.3%
30 - 32	2.7%	60 - 65	1.8%
33 - 35	0.9%	66 - 71	0.0%
36 - 38	0.9%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.9%	84 - 89	0.0%
> 44	1.8%	> 89	0.0%
(Cases) N=	113	(Cases) N=	113
mean	16	mean	35
min number	1	min width (cm)	3
max number	55	max width (cm)	64

San Clemente Island - Horse Beach Cove

*Macrocystis pyrifera* Ad.(>1m) number of stipes    *Macrocystis pyrifera* Ad.(>1m) holdfast diameters

< 3	1.7%	< 6	1.7%
3 - 5	1.7%	6 - 11	0.0%
6 - 8	3.5%	12 - 17	1.7%
9 - 11	13.9%	18 - 23	16.5%
12 - 14	16.5%	24 - 29	29.6%
15 - 17	19.1%	30 - 35	21.7%
18 - 20	16.5%	36 - 41	15.7%
21 - 23	6.1%	42 - 47	9.6%
24 - 26	7.0%	48 - 53	2.6%
27 - 29	7.0%	54 - 59	0.9%
30 - 32	1.7%	60 - 65	0.0%
33 - 35	1.7%	66 - 71	0.0%
36 - 38	1.7%	72 - 77	0.0%
39 - 41	0.0%	78 - 83	0.0%
42 - 44	0.9%	84 - 89	0.0%
> 44	0.9%	> 89	0.0%
(Cases) N=	115	(Cases) N=	115
mean	18	mean	30
min number	1	min width (cm)	3
max number	48	max width (cm)	55

2004 Gorgonian/Stylaster californica Size Frequency Distributions  
Santa Cruz Island - Gull Island South

<i>Stylaster californica heights</i>		<i>Stylaster californica widths</i>	
< 3	23.7%	< 3	5.1%
3 - 4	28.8%	3 - 4	18.6%
5 - 6	10.2%	5 - 6	8.5%
7 - 8	3.4%	7 - 8	15.3%
9 - 10	16.9%	9 - 10	5.1%
11 - 12	6.8%	11 - 12	3.4%
13 - 14	6.8%	13 - 14	6.8%
15 - 16	1.7%	15 - 16	8.5%
17 - 18	0.0%	17 - 18	3.4%
19 - 20	0.0%	19 - 20	6.8%
21 - 22	0.0%	21 - 22	1.7%
23 - 24	0.0%	23 - 24	1.7%
25 - 26	0.0%	25 - 26	0.0%
27 - 28	0.0%	27 - 28	1.7%
29 - 30	1.7%	29 - 30	0.0%
> 30	0.0%	> 30	13.6%
<b>(Cases) N=</b>	<b>59</b>	<b>(Cases) N=</b>	<b>59</b>
<b>mean</b>	<b>6</b>	<b>mean</b>	<b>13</b>
<b>min height (cm)</b>	<b>1</b>	<b>min width (cm)</b>	<b>2</b>
<b>max height (cm)</b>	<b>29</b>	<b>max width (cm)</b>	<b>43</b>

<i>Lophogorgia chilensis heights</i>		<i>Lophogorgia chilensis widths</i>	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	12.0%
9 - 12	0.0%	9 - 12	16.0%
13 - 16	8.0%	13 - 16	24.0%
17 - 20	32.0%	17 - 20	12.0%
21 - 24	12.0%	21 - 24	20.0%
25 - 28	16.0%	24 - 28	8.0%
29 - 32	8.0%	29 - 32	0.0%
33 - 36	12.0%	33 - 36	0.0%
37 - 40	4.0%	37 - 40	0.0%
41 - 44	0.0%	41 - 44	4.0%
45 - 48	0.0%	45 - 48	0.0%
49 - 52	0.0%	49 - 52	0.0%
53 - 56	4.0%	53 - 56	0.0%
57 - 60	4.0%	57 - 60	4.0%
61 - 64	0.0%	61 - 64	0.0%
65 - 68	0.0%	65 - 68	0.0%
69 - 72	0.0%	69 - 72	0.0%
73 - 76	0.0%	73 - 76	0.0%
77 - 80	0.0%	77 - 80	0.0%
81 - 84	0.0%	81 - 84	0.0%
85 - 88	0.0%	85 - 88	0.0%
89 - 92	0.0%	89 - 92	0.0%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	0.0%
> 100	0.0%	> 100	0.0%
<b>(Cases) N=</b>	<b>25</b>	<b>(Cases) N=</b>	<b>25</b>
<b>mean</b>	<b>27</b>	<b>mean</b>	<b>19</b>
<b>min height (cm)</b>	<b>16</b>	<b>min width (cm)</b>	<b>7</b>
<b>max height (cm)</b>	<b>58</b>	<b>max width (cm)</b>	<b>58</b>

2004 Gorgonian/Stylaster californica Size Frequency Distributions  
Santa Cruz Island - Fry's Harbor

<i>Lophogorgia chilensis heights</i>		<i>Lophogorgia chilensis widths</i>	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	1.3%
9 - 12	0.0%	9 - 12	1.3%
13 - 16	1.3%	13 - 16	7.0%
17 - 20	5.1%	17 - 20	5.1%
21 - 24	3.2%	21 - 24	12.7%
25 - 28	7.0%	24 - 28	8.9%
29 - 32	8.2%	29 - 32	15.2%
33 - 36	10.8%	33 - 36	10.1%
37 - 40	14.6%	37 - 40	10.1%
41 - 44	15.8%	41 - 44	5.7%
45 - 48	7.0%	45 - 48	8.9%
49 - 52	5.7%	49 - 52	3.2%
53 - 56	7.6%	53 - 56	1.3%
57 - 60	2.5%	57 - 60	0.6%
61 - 64	2.5%	61 - 64	1.3%
65 - 68	3.2%	65 - 68	3.8%
69 - 72	2.5%	69 - 72	1.3%
73 - 76	1.9%	73 - 76	0.6%
77 - 80	1.3%	77 - 80	1.3%
81 - 84	0.0%	81 - 84	0.6%
85 - 88	0.0%	85 - 88	0.0%
89 - 92	0.0%	89 - 92	0.0%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	0.0%
> 100	0.0%	> 100	0.0%
<b>(Cases) N=</b>	<b>158</b>	<b>(Cases) N=</b>	<b>158</b>
<b>mean</b>	<b>42</b>	<b>mean</b>	<b>35</b>
<b>min height (cm)</b>	<b>16</b>	<b>min width (cm)</b>	<b>5</b>
<b>max height (cm)</b>	<b>79</b>	<b>max width (cm)</b>	<b>83</b>

Santa Cruz Island - Pelican Bay

<i>Lophogorgia chilensis heights</i>		<i>Lophogorgia chilensis widths</i>	
< 5	0.0%	< 5	3.1%
5 - 8	3.1%	5 - 8	0.0%
9 - 12	0.0%	9 - 12	6.2%
13 - 16	3.1%	13 - 16	6.2%
17 - 20	3.1%	17 - 20	9.2%
21 - 24	1.5%	21 - 24	12.3%
25 - 28	16.9%	24 - 28	6.2%
29 - 32	20.0%	29 - 32	13.8%
33 - 36	18.5%	33 - 36	16.9%
37 - 40	12.3%	37 - 40	7.7%
41 - 44	7.7%	41 - 44	7.7%
45 - 48	9.2%	45 - 48	4.6%
49 - 52	3.1%	49 - 52	0.0%
53 - 56	1.5%	53 - 56	4.6%
57 - 60	0.0%	57 - 60	1.5%
61 - 64	0.0%	61 - 64	0.0%
65 - 68	0.0%	65 - 68	0.0%
69 - 72	0.0%	69 - 72	0.0%
73 - 76	0.0%	73 - 76	0.0%
77 - 80	0.0%	77 - 80	0.0%
81 - 84	0.0%	81 - 84	0.0%
85 - 88	0.0%	85 - 88	0.0%
89 - 92	0.0%	89 - 92	0.0%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	0.0%
> 100	0.0%	> 100	0.0%
<b>(Cases) N=</b>	<b>65</b>	<b>(Cases) N=</b>	<b>65</b>
<b>mean</b>	<b>33</b>	<b>mean</b>	<b>29</b>
<b>min height (cm)</b>	<b>5</b>	<b>min width (cm)</b>	<b>2</b>
<b>max height (cm)</b>	<b>53</b>	<b>max width (cm)</b>	<b>60</b>

2004 Gorgonian/Stylaster californica Size Frequency Distributions  
Santa Cruz Island - Yellow Banks

<i>Lophogorgia chilensis heights</i>		<i>Lophogorgia chilensis widths</i>	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	3.0%
9 - 12	0.0%	9 - 12	16.0%
13 - 16	10.0%	13 - 16	20.0%
17 - 20	27.0%	17 - 20	22.0%
21 - 24	18.0%	21 - 24	20.0%
25 - 28	15.0%	24 - 28	5.0%
29 - 32	8.0%	29 - 32	2.0%
33 - 36	5.0%	33 - 36	2.0%
37 - 40	6.0%	37 - 40	6.0%
41 - 44	5.0%	41 - 44	1.0%
45 - 48	0.0%	45 - 48	1.0%
49 - 52	3.0%	49 - 52	0.0%
53 - 56	2.0%	53 - 56	1.0%
57 - 60	1.0%	57 - 60	1.0%
61 - 64	0.0%	61 - 64	0.0%
65 - 68	0.0%	65 - 68	0.0%
69 - 72	0.0%	69 - 72	0.0%
73 - 76	0.0%	73 - 76	0.0%
77 - 80	0.0%	77 - 80	0.0%
81 - 84	0.0%	81 - 84	0.0%
85 - 88	0.0%	85 - 88	0.0%
89 - 92	0.0%	89 - 92	0.0%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	0.0%
> 100	0.0%	> 100	0.0%
<b>(Cases) N=</b>	<b>100</b>	<b>(Cases) N=</b>	<b>100</b>
mean	26	mean	20
min height (cm)	13	min width (cm)	6
max height (cm)	59	max width (cm)	57

2004 Gorgonian/Stylaster californica Size Frequency Distributions  
Anacapa Island - Admiral's Reef

<i>Lophogorgia chilensis heights</i>		<i>Lophogorgia chilensis widths</i>	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	0.0%
9 - 12	0.8%	9 - 12	2.5%
13 - 16	0.8%	13 - 16	5.9%
17 - 20	1.7%	17 - 20	2.5%
21 - 24	4.2%	21 - 24	7.6%
25 - 28	6.7%	24 - 28	2.5%
29 - 32	6.7%	29 - 32	6.7%
33 - 36	7.6%	33 - 36	0.0%
37 - 40	5.0%	37 - 40	6.7%
41 - 44	10.9%	41 - 44	7.6%
45 - 48	13.4%	45 - 48	4.2%
49 - 52	5.9%	49 - 52	5.9%
53 - 56	9.2%	53 - 56	11.8%
57 - 60	9.2%	57 - 60	3.4%
61 - 64	5.0%	61 - 64	5.0%
65 - 68	5.0%	65 - 68	3.4%
69 - 72	1.7%	69 - 72	8.4%
73 - 76	2.5%	73 - 76	3.4%
77 - 80	1.7%	77 - 80	5.9%
81 - 84	0.0%	81 - 84	0.8%
85 - 88	0.8%	85 - 88	0.8%
89 - 92	0.8%	89 - 92	0.8%
93 - 96	0.0%	93 - 96	1.7%
97 - 100	0.0%	97 - 100	0.8%
> 100	0.0%	> 100	1.7%
<b>(Cases) N=</b>	<b>119</b>	<b>(Cases) N=</b>	<b>119</b>
<b>mean</b>	<b>46</b>	<b>mean</b>	<b>50</b>
<b>min height (cm)</b>	<b>9</b>	<b>min width (cm)</b>	<b>9</b>
<b>max height (cm)</b>	<b>90</b>	<b>max width (cm)</b>	<b>104</b>

<i>Muricea californica heights</i>		<i>Muricea californica widths</i>	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	2.5%
9 - 12	0.0%	9 - 12	0.0%
13 - 16	0.0%	13 - 16	0.0%
17 - 20	2.5%	17 - 20	5.0%
21 - 24	2.5%	21 - 24	2.5%
25 - 28	5.0%	24 - 28	0.0%
29 - 32	12.5%	29 - 32	5.0%
33 - 36	10.0%	33 - 36	2.5%
37 - 40	5.0%	37 - 40	0.0%
41 - 44	12.5%	41 - 44	2.5%
45 - 48	25.0%	45 - 48	10.0%
49 - 52	7.5%	49 - 52	0.0%
53 - 56	10.0%	53 - 56	7.5%
57 - 60	0.0%	57 - 60	2.5%
61 - 64	0.0%	61 - 64	5.0%
65 - 68	0.0%	65 - 68	12.5%
69 - 72	2.5%	69 - 72	10.0%
73 - 76	0.0%	73 - 76	7.5%
77 - 80	2.5%	77 - 80	5.0%
81 - 84	0.0%	81 - 84	0.0%
85 - 88	0.0%	85 - 88	5.0%
89 - 92	0.0%	89 - 92	5.0%
93 - 96	0.0%	93 - 96	2.5%
97 - 100	0.0%	97 - 100	7.5%
> 100	2.5%	> 100	0.0%
<b>(Cases) N=</b>	<b>40</b>	<b>(Cases) N=</b>	<b>40</b>
<b>mean</b>	<b>44</b>	<b>mean</b>	<b>62</b>
<b>min height (cm)</b>	<b>19</b>	<b>min width (cm)</b>	<b>7</b>
<b>max height (cm)</b>	<b>104</b>	<b>max width (cm)</b>	<b>100</b>

2004 Gorgonian/*Stylaster californica* Size Frequency DistributionsSanta Barbara Island - SE Sea Lion Rookery

<i>Lophogorgia chilensis</i> heights		<i>Lophogorgia chilensis</i> widths	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	2.2%
9 - 12	0.0%	9 - 12	8.7%
13 - 16	2.2%	13 - 16	10.9%
17 - 20	2.2%	17 - 20	10.9%
21 - 24	6.5%	21 - 24	26.1%
25 - 28	4.3%	24 - 28	19.6%
29 - 32	15.2%	29 - 32	15.2%
33 - 36	21.7%	33 - 36	0.0%
37 - 40	26.1%	37 - 40	4.3%
41 - 44	6.5%	41 - 44	0.0%
45 - 48	6.5%	45 - 48	0.0%
49 - 52	6.5%	49 - 52	0.0%
53 - 56	2.2%	53 - 56	0.0%
57 - 60	0.0%	57 - 60	0.0%
61 - 64	0.0%	61 - 64	0.0%
65 - 68	0.0%	65 - 68	2.2%
69 - 72	0.0%	69 - 72	0.0%
73 - 76	0.0%	73 - 76	0.0%
77 - 80	0.0%	77 - 80	0.0%
81 - 84	0.0%	81 - 84	0.0%
85 - 88	0.0%	85 - 88	0.0%
89 - 92	0.0%	89 - 92	0.0%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	0.0%
> 100	0.0%	> 100	0.0%
<b>(Cases) N=</b>	<b>46</b>	<b>(Cases) N=</b>	<b>46</b>
<b>mean</b>	<b>36</b>	<b>mean</b>	<b>24</b>
<b>min height (cm)</b>	<b>13</b>	<b>min width (cm)</b>	<b>8</b>
<b>max height (cm)</b>	<b>52</b>	<b>max width (cm)</b>	<b>65</b>

<i>Muricea californica</i> heights		<i>Muricea californica</i> widths	
< 5	0.0%	< 5	0.0%
5 - 8	0.0%	5 - 8	0.0%
9 - 12	0.0%	9 - 12	0.0%
13 - 16	7.1%	13 - 16	0.0%
17 - 20	3.6%	17 - 20	0.0%
21 - 24	0.0%	21 - 24	0.0%
25 - 28	7.1%	24 - 28	3.6%
29 - 32	10.7%	29 - 32	0.0%
33 - 36	7.1%	33 - 36	7.1%
37 - 40	7.1%	37 - 40	0.0%
41 - 44	10.7%	41 - 44	0.0%
45 - 48	14.3%	45 - 48	3.6%
49 - 52	7.1%	49 - 52	7.1%
53 - 56	14.3%	53 - 56	3.6%
57 - 60	3.6%	57 - 60	3.6%
61 - 64	0.0%	61 - 64	3.6%
65 - 68	0.0%	65 - 68	3.6%
69 - 72	7.1%	69 - 72	7.1%
73 - 76	0.0%	73 - 76	10.7%
77 - 80	0.0%	77 - 80	7.1%
81 - 84	0.0%	81 - 84	7.1%
85 - 88	0.0%	85 - 88	3.6%
89 - 92	0.0%	89 - 92	3.6%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	14.3%
> 100	0.0%	> 100	10.7%
<b>(Cases) N=</b>	<b>28</b>	<b>(Cases) N=</b>	<b>28</b>
<b>mean</b>	<b>42</b>	<b>mean</b>	<b>74</b>
<b>min height (cm)</b>	<b>15</b>	<b>min width (cm)</b>	<b>26</b>
<b>max height (cm)</b>	<b>70</b>	<b>max width (cm)</b>	<b>119</b>

## 2004 Gorgonian/Stylaster californica Size Frequency Distributions

San Clemente Island - Horse Beach Cove

<i>Muricea californica</i> heights		<i>Muricea californica</i> widths	
< 5	12.0%	< 5	20.0%
5 - 8	28.0%	5 - 8	28.0%
9 - 12	28.0%	9 - 12	24.0%
13 - 16	12.0%	13 - 16	4.0%
17 - 20	4.0%	17 - 20	4.0%
21 - 24	8.0%	21 - 24	12.0%
25 - 28	0.0%	24 - 28	0.0%
29 - 32	8.0%	29 - 32	0.0%
33 - 36	0.0%	33 - 36	0.0%
37 - 40	0.0%	37 - 40	8.0%
41 - 44	0.0%	41 - 44	0.0%
45 - 48	0.0%	45 - 48	0.0%
49 - 52	0.0%	49 - 52	0.0%
53 - 56	0.0%	53 - 56	0.0%
57 - 60	0.0%	57 - 60	0.0%
61 - 64	0.0%	61 - 64	0.0%
65 - 68	0.0%	65 - 68	0.0%
69 - 72	0.0%	69 - 72	0.0%
73 - 76	0.0%	73 - 76	0.0%
77 - 80	0.0%	77 - 80	0.0%
81 - 84	0.0%	81 - 84	0.0%
85 - 88	0.0%	85 - 88	0.0%
89 - 92	0.0%	89 - 92	0.0%
93 - 96	0.0%	93 - 96	0.0%
97 - 100	0.0%	97 - 100	0.0%
> 100	0.0%	> 100	0.0%
<b>(Cases) N=</b>	<b>25</b>	<b>(Cases) N=</b>	<b>25</b>
<b>mean</b>	<b>12</b>	<b>mean</b>	<b>12</b>
<b>min height (cm)</b>	<b>3</b>	<b>min width (cm)</b>	<b>2</b>
<b>max height (cm)</b>	<b>31</b>	<b>max width (cm)</b>	<b>40</b>

Appendix K. 2004 Species List for all Channel Islands National Park Kelp Forest Monitoring Stations.

**Introduction:**

The species list contains presence/absence and relative abundance data for all species that could be found and identified during the site visits between June and September. Generally at least one dive is made by an experienced biologist strictly for species list observations. The overall effort varies from station to station with the water conditions and available time. Relative abundance values are subjective, and generally based on opinions of several divers viewing the overall site. Some species assemblages are more difficult to identify than others and may be lumped into general categories. Organisms were generally not collected for additional taxonomic work. When identification is tentative we either do not mark it or place a question mark on the list. Some categories, (e.g. sponges or tunicates) may be much more diverse than it would appear from the list.

**Abundance Ratings:**

X - present, no relative abundance rating given

4 - abundant, organism present in higher than normal densities

3 - common, organism found over most of site or in high density patches

2 - present, organism found in moderate numbers

1 - rare, few organisms found

0 - noticeably absent, an effort was made to look for an organism that was not found.

**Notes:**

e - eggs

j or jvs - juvenile

s - shell only

int - intertidal

d - drift

PM or night - seen only on night dive

JX - juveniles present and adults present

#/J# - (e.g. 2/J3 - adult abundance 2, juvenile abundance 3)

nests - *Hypsypops* nest turf

dis - diseased

Station names are listed in Table 2 of the text.



LOCATION: SPECIES: SITE#:	SMWL 1	SMHR 2	SRJLNO 3	SRJLSO 4	SRRR 5	SCGI 6	SCFH 7	SCPB 8	SCSA 9	SCYB 10	ANAR 11	ANCC 12	ANLC 13	SBSSESL 14	SBAP 15	SBCAT 16	CLNWH 17	CLBSC 18	CLEP 19	CLHBC 20
CHLOROPHYTA																				
BRYOPSIS CORTICULANS															1	1				
CHAETOMORPHA SP.						1														
CHAETOMORPHA SPIRALIS																	1	3	1	1
CLADOPHORA SP.								X					X	X			1	2	1	1
CODIUM CUNEATUM															1		2			1
CODIUM FRAGILE						1	2	2	X		2	X	1	1		1				
CODIUM HUBBSII/SETCHELLII				X	X	X					2			3	3	2	2			2
DERBESIA MARINA															1	1	2	1	1	1
ENTEROMORPHA SP.															2					
HALICYSTIS OVALIS						2	X		X			X	1	1						
ULVA SP.		2										X								
PHAEOPHYTA																				
AGARUM FIMBRIATUM																				3/j3
COLPOMENIA SP.							X	2	2		2	3	2	1	2	2	1	X		
COLPOMENIA PEREGRINA															2	2				
CYTOSEIRA SP.	1	1	2	2	0	1	1	0	1	1	1	2	2	0	1	1	2	2	1	2
CYTOSEIRA NEGLECTA															2	2				
DESMARESTIA SP.	0	3	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
DICTYONEUROPSIS RETICULATA	2			2		1														
DICTYOPTERIS UNDULATA																2	3		2	2
DICTYOTA BINGHAMIAE															2	2	3		2	2
DICTYOTA FLABELLATA																1	2		2	2
DICTYOTA/PACHYDICTYON			2	2		X		X	1	X	2	3	3	X				3		
ECTOCARPOID FUZZ															1					
EGREGIA MENZIESII															j1		d	d	d	
EISENIA ARBOREA	1	2	2/J1	2/J1	0	2/J3	1/J2	0	0	1	2/J1	2/J1	3/J2	0	2	1/J1	2	3/J2	2	2/J2
HALIDRYS DIOICA															1		d	d	d	
LAMINARIA FARLOWII	0	0	2	3/J2	0	1	0	0	0	2	0	1/J1	3/J4	0	1	1	3/J2	3/J3	3/J3	2
LAMINARIA SETCHELLII		1																		
MACROCYSTIS PYRIFERA	3/J2	4/J2	3/J2	3/J3	3/J2	3/J3	1/J1	0	1	3/J2	2/J1	3/J3	4/J4	0/J1	1/J1	1/J1	4/J4	4/J2	4/J4	4/J3
PACHYDICTYON CORIACEUM																1				
PELAGOPHYCUS PORRA																	d			
PTERYGOPHORA CALIFORNICA	2	0	2/J2	2/J2	0	1/J1	0	0	0	2/J1	0	0	2/J2	0	0	0	1	0	0	0
SARGASSUM SP.								1	1									X		
SARGASSUM MUTICUM															3	1				

LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSESL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
TAONIA LENNEBACKERIAE															3	2				
TINOCLADIA CRASSA															1					
ZONARIA FARLOWII																	2	3		3
RHODOPHYTA	2	2	3	3	2	3	2	2	1	1	2		2	1						
ACROSORIUM UNCINATUM																1	X		X	X
AMPHIROA ZONATA															2	1				
BONNEMAISONIA HAMIFERA																	1			
BOSSIELLA/CALLIARTHRON													2		2	2	3	2	2	2
BOTRYOCLADIA PSEUDODICHOTOMA																	3		3	3
CALLIARTHRON SP.																			3	
CALLIARTHRON TUBERCULOSUM															2					
CALLOPHYLLIS SP.	X	X																		X
CALLOPHYLLIS FLABELLULATA																	2			
CALLOPHYLLIS VIOLACEA																	2			
CARPOPELTIS SP.																	2			
CARPOPELTIS BUSHIAE																				2
CERAMIACEAE															x	x	X			
CHONDRIA CALIFORNICA															2					
COELOSEIRA COMPRESSA																	2		2	3
CORALLINA OFFICINALIS															2	2	3		3	3
CORALLINA PINNATIFOLIA																			X	X
CORALLINA VANCOUVERIENSIS																	2			
CORALLINES - ENCRUSTING	2	2	2	2	2	3	1	1	3	2	1	3	3	2	4	4	2	2	3	3
CORALLINES - ERECT	2	2	2	2	1	2	2	3	1	1	2	2	2	1	2	2	3	1	3	2
FAUCHEA SP.															2					
GELIDIUM SP.	0	1	0	0	0	0		1	0	0	0		3							
GELIDIUM NUDIFRONS																	3		2	2
GELIDIUM PURPURASCENS															2					
GELIDIUM ROBUSTUM													3				2		1	1
GIGARTINA SP.	1	1	3	3	1	0	1	0	0	0	0	0	1	1	0	0		0	1	
GIGARTINA CANALICULATA																				
GIGARTINA CORYMBIFERA	1	1	2	3			1						1	1	1					
GIGARTINA SPINOSA															1	1				
GYMNOGONGRUS LEPTOPHYLLUS																	X		X	
HALIPTYLON GRACILE															X	2	X		X	X



LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSSESL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
YELLOW SPONGE W/TALL PORES	X		X														X			X
ACARNUS SP.																		X		
CLIONA SP.			X	X									X							X
CLIONA CELATA	X																			
HALICLONA SP.						2					2				2				3	2
HYMENAMPHIASTRA CYANOCRYPTA	X			X		2							X				2		2	2
LISSODENDORYX TOPSENTI															1					2
PENARES CORTIUS															X		X			X
RED SPONGES - ENCRUSTING	X		X	X	X	2	X	X	X	X	X	X	X	2	2		X	2	X	2
SPHECIOSPONGIA CONFOEDERATA					1															
TETHYA AURANTIA	3	1	3	3	2	2	1	1	2	2	1	1	1	3	2	1	0	1	0	1
TETILLA ARB	X		X	2	2															
VERONGIA AUREA											X		X		X		2		2	1
XESTOSPONGIA TRINDINAEA	X		X	X	X	3				X										2
CNIDARIA																				
HYDROZOA																		2		
AGLAOPHENIA SP.			X	X																
AGLAOPHENIA LATIROSTRIS	X			X								X								
ALLOPORA CALIFORNICA (STYLASTER CALIFORNICUS)						3														
ANTENELLA AVALONIA																	X			
GARVEIA ANNULATA						2														
LYTOCARPUS NUTTINGI																1				2
OBELIA SP.	X		X	X	X	3	X		X	3	3	X					2	X	X	3
PLUMULARIA SP.	X	X			2	X			X		2			X	2	1	1		X	3
SERTULARELLA SP./SERTULARIA SP.					2	X							X	X			1			2
SERTULARIA SP.													X						X	
TUBULARIA SP.				X		X							X		2					
CLAVULARIA SP.						X	4	2	X		2	4	2		3	2				
PACHYCERIANTHUS FIMBRIATUS	2	X		X	X	X		X	2	2	2			X		1		X		
HYDRACTINIA MILLERI		1		X			2					X		X	2	1				1
EUGORGIA RUBENS											4							2		1
LOPHOGORGIA CHILENSIS	1	0	1	2	1	2	3	3	1	2	3	1	2	3	1	1	0	2		1
MURICEA CALIFORNICA	0	0		1	0	1	0	1	0	2	2	1	1	3	1	1		3	X	2/J2
MURICEA FRUTICOSA	0	0	0	0	0	0	0	0	0	2	2	0	1	1	1	0		2		1

LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSSESL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
RENILLA KOLLIKERI															X					
PARAZOANTHUS LUCIFICUM											X									
CORYNACTIS CALIFORNICA	2	3	2	3	2	2	2	2	2	2	2	1	2	2	3	2				
ANTHOPLEURA ARTEMISIA																				1
ANTHOPLEURA SOLA	X	X	X		X					X			X	2	2	1			X	
CACTOSOMA/SAGARTIA				X		X			X		X	X	X	X	1	X	1			1
EPIACTIS PROLIFERA	2	X	2	2	2	X										1	1		1	1
HALCAMP DECEMENTACULATA	X		X	X												1			1	
PHYLLACTIS BRADLEYI															2					
TEALIA COLUMBIANA (URTICINA COLUMBIANA)					1															
TEALIA CORIACEA (URTICINA CORIACEA)			2	X	X	2	X		1	2	2		X	X	1	1		1	1	1
TEALIA LOFOTENSIS (URTICINA LOFOTENSIS)	3	2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ZAOLUTUS ACTIUS														X	2	1			X	
ORDER MADREPORARIA																				
ASTRANGIA LAJOLLENSIS (=A. HAIMEI)	2	2	2	2	2	2	4	3	2	2	2	2	2	2	2	2	2			
BALANOPHYLLIA ELEGANS	2	2	2	4	3	3	1	2	2	2	2		1	1	1	1	2		2	
COENOCYATHUS BOWERSI															1					
PARACYATHUS STEARNSI (=P. STEARNSII)	3	X	X	X		2		X	X	X	X	2	X	X	2	1	1	X	1	1
LEUCOTHEA SP.															X					
CESTUM/VELLUM															X					
PLATYHELMINTHES		X				X	X			X			3							
PROSTHECERAEUS BELLOSTRIATUS																	X			
NEMERTEA																				
TUBULANUS POLYMORPHOUS												X								
SIPUNCULA															X					
ECHIURA																				
ANNELIDA																				
POLYCHAETA																				
ARCTONOE SP.										X			X							
ARCTONOE PULCHRA																X	X		X	
ARCTONOE VITTATA																			X	
CHAETOPTERUS			X	X	1	2	2	2	2	X	X		2	X	2			X	1	1





LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSSESL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>SCYRA ACUTIFRONS</b>															2					
ARACHNIDA																				
ACARINA																				
INSECTA																				
DIPTERA																				
CHLOROPIDAE																				
CHIRONOMIDAE																				
COELOPIDAE																				
EPHYDRIDAE																				
COLEPTERA																				
STAPHYLINIDAE																				
CARABIDAE																				
HYDRAENIDAE																				
CURCULIONIDAE																				
HISTERIDAE																				
HYDROPHILIDAE																				
HEMIPTERA																				
SALIDIIDAE																				
MOLLUSCA																				
GASTROPODA																				
<b>ACMAEA MITRA</b>	X	X								X										
<b>AMPHISSA VERSICOLOR</b>			X	X		X	X	X	X			X	X			X				
<b>LITHOPOMA GIBBEROSUM</b> (=Astraea gibberosa)	3	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<b>LITHOPOMA UNDOSUM</b> (=Astraea undosa)	0	0	1	0	0	0	0	1	2	2	1	3	2	1	3	2	1	1	1	1
<b>BURSA CALIFORNICA</b> (=Crossata californica)	2			X		X				X	X	X				1				
<b>CALLIOSTOMA SP.</b>	X	2	X	X	X	X				2				X						
<b>CALLIOSTOMA GLORIOSUM</b>															2					
<b>CALLIOSTOMA SUPRAGRANOSUM</b>															2					
<b>CERATOSTOMA FOLIATUM</b>	2	2		X		X											1		X	1
<b>CERATOSTOMA NUTTALLI</b>							X	X	2	X	X	X	X		3	X		X	X	1
<b>CONUS CALIFORNICUS</b>	X					X		X	X	X		X	2		3	2/e	2/e	2/e	2/e	2/e
<b>CREPIDULA SP.</b>			X	X		X		X	X			X	X					X		
<b>CREPIATELLA LINGULATA</b>						X							X	X	X	3	2			X
<b>CRUCIBULUM SPINOSUM</b>														X						
<b>CYPRAEA SPADICEA</b>	1	3	2	3	1	2	2	2	3	2	2	2	2	1	2	2	1	1	1	1



LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSESL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
SITE#:																				
NUDIBRANCHIA																				
ANISODORIS NOBILIS	X	X	X	X	1	X				X				X						
ARCHIDORIS MONTEREYENSIS						X														
CADLINA LIMBAUGHI						X														
CADLINA LUTEOMARGINATA																	X			
DIAULULA SANDIEGENSIS						X				X										
DORIOPSISILLA ALBOPUNCTATA															X		X	X		
FLABELLINOPSIS IODINEA (=Coryphella iodinea)						X	X	1			X		X	X	X	X		X	X	
HERMISSENDA CRASSICORNIS	X			X		X	X					X			X		X	X	X	
LAILA COCKERELLI												X								
MEXICHROMIS PORTERAE						X														
PHIDIANA PUGNAX						X													X	
POLYCERA ATRA															X					
TRIOPHA CATALINAE						X				X	X	X			X					
TRITONIA FESTIVA PULMONATA				X																
POLYPLACOPHORA										X			X							
CRYPTOCHITON STELLERI	1																			
LEPIDOZONA SP.															X				X	
TONICELLA LINEATA	X	2	X	X																
BIVALVIA																				
AMERICARDIA BIANGULATA								s	X											
CHAMA ARCANA	X	X	X			X	X	2	2		X	X	3		X		X			X
DIPLODONTA ORBELLUS															X				s	s
GARI CALIFORNICA								s	s						s	s				
CRASSEDOMA GIGANTEUM (=Hinnites giganteus)	2	2	2	2	1	2/J2	2/J2	3/J2	2/J2	1	1	2	3	2	2	1		1	1	1
LIMA HEMPHILLI						X	2	3	X			X								
PECTEN DIEGENSIS								1		s										
PENITELLA CONRADI									X											
PHOLAD	X		2	2		X	X	2	2	X	X					X				
PODODESMUS CEPIO	X	2	X	2	X	X		X	2	X	X	2	X	X	X	1				
PTERIA STERNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
SEMELE DECISA															s			s		
VENTRICOLARIA FORDII						X	X	2	X					X	X	s				
OCTOPUS BIMACULATUS														2	3	2	2		1	2





LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC	
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
PARVIMENSIS																					
CHORDATA																					
UROCHORDATA (TUNICATA)																					
APLIDIUM SP.	X		X							X		X	X		1	1					
APLIDIUM CALIFORNICUM																	2		X	X	
BOLTENIA VILLOSA	2	1	X	X	3																
CLAVELINA HUNTSMANI						X							1			1	1	2	1	1	
CYSTODYTES LOBATUS	X	X			2			1		1	X										
DIDEMNUM/TRIDIDEMNUM	X		2	2	2	2		1	1	X		X	2				3		X	3	
DIDEMNUM CARNULENTUM						2												2			
DIPLOSOMA MACDONALDI						X	X														
DISTAPLIA OCCIDENTALIS						X					X						X		X	X	
EUHERDMANIA CLAVIFORMIS																					X
HALOCYNTHIA HILGENDORFI										X											
IGABOJA																					
LARVACEANS														X							
METANDROCARPA DURA														X							
METANDROCARPA TAYLORI																	2	X	2	2	
MOLGULA SP.																					X
POLYCLINUM PLANUM			1	1																	
PYCNOCLOVELLA STANLEYI	2												X	1	1	1					
PYURA HAUSTOR	X			X										X	X						
RITTERELLA SP.															X						
STYELA MONTEREYENSIS	2	1	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SALPS																					
VERTEBRATA																					
CHONDRICHTYES																					
CEPHALOSCYLLIUM VENTRIOSUM			X					X	X	X		X									2
CETORHINUS MAXIMUS																					
HETERODONTUS FRANCISCI									X												
GALEORHINUS GALEUS																		X			
MYLIOBATIS CALIFORNICA	1		1				X	X			X	X	X		X				X	2	
SQUATINA CALIFORNICA														1		1					
GYMNOTHORAX MORDAX							1				1		1		2				J1		
GOBIESOX SP.						X					X	X	X		1						
SARDINOPS SAGAX			X	X						X	2	4		X							
ENGRAULIS MORDAX													X								
ATHERINOPS																2					

LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSSESL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
CALIFORNIENSIS																				
ATHERINOPS/LEURESTHES	2	2	X	X	3	X				2		X	X		X	X				
AULORHYNCHUS FLAVIDUS	3	3								X										
AGONIDAE																				
RATHBUNELLA HYPOPLECTA		X	X		1		X							X						
TRACHURUS SYMMETRICUS		X	X	X						X										
ALLOCLINUS HOLDERI	0	0	0	0	0	0	2	2	2	1	2	2/J2	2	2	2	2	2	2	2	2
GIBBONSIA SP.	1	1	X									X			1	1	1			1
HETEROSTICHUS ROSTRATUS			X									X	X		1	X	1	1		1
H. ROSTRATUS (JUVENILES)						X				3		X	4		1	1				
NEOCLINUS SP.			X												1					
NEOCLINUS STEPHANSAE								2	2					1		1				
COTTIDAE																				
ARTEDIUS CORALLINUS	X	1	X	X	X	X			X			X		2	2	2				
ARTEDIUS CREASERI																1				
ARTEDIUS HARRINGTONI			X				X													
LEIOCOTTUS HIRUNDO					X															
OLIGOCOTTUS SNYDERI																				
ORTHONOPIAS TRIACIS	X	2	X	X	X	X	X		X	X			X	2	2	2	2		X	2
SCORPAENODES XYRIS																				
SCORPAENICHTHYS MARMORATUS				X		2	X	X				X			2	1				1
BRACHYISTIUS FRENATUS	3	2	4	4	3	3			0	3		3	X	0	0	0	2	3	2	3
CYMATOGASTER AGGREGATA												4		0						
RHACOCHILUS VACCA	1	2	2	2	2	X	X	2	X	X	2	2	X	0	X	1	X	1	X	1
EMBIOTOCA JACKSONI	2/J1	2/J1	3	2	2/J2	2	X	2/J1	2/J2	2	2	3/J3	3/J2	0	1	1	X	2	2	2
EMBIOTOCA LATERALIS	3/J2	2/J2	3	3	3/J2	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0
HYP SURUS CARYI	1	X	X	X		X				X								X	X	
PHANERODON FURCATUS				X		X	X			X										
RHACOCHILUS TOXOTES	1	1	X	X	2		X	3	X			X	0							
CORYPHOPTERUS NICHOLSI	2	2	2	2	1	1	2	4	3	2	4	3	2	3	2	2	2	3	1	3
LYTHRYPNUS DALLI	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	1	0	0
LYTHRYPNUS ZEBRA			0	0			X	1	0		1		1	0	0	0	0	2	1	0
OPHIODON ELONGATUS	2	2	X	X		X	X													
OXYLEBIUS PICTUS	3	2	3	3	3	4	3	1	2	2	4	3	2	2	3	2	1		1	1
GIRELLA NIGRICANS	0	0	1	2	0	1	2	1	2	0	2	2	3	1	2	2		X	1	1
MEDIALUNA CALIFORNIENSIS							X		X		2	X	2		2	1		1	1	1

LOCATION:	SMWL	SMHR	SRJLNO	SRJLSO	SRRR	SCGI	SCFH	SCPB	SCSA	SCYB	ANAR	ANCC	ANLC	SBSSEL	SBAP	SBCAT	CLNWH	CLBSC	CLEP	CLHBC
SPECIES: SITE#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
MEDIALUNA (JUVENILES)										1			0							
HALICHOERES SEMICINCTUS	0	0	1	0	0	0									1					
H. SEMICINCTUS (FEMALES)	0	0	1	0	0	0	1	1	1	1	2	2	2	0	1	1	2	2	1	2
H. SEMICINCTUS (MALES)	0	0	1	0	0	0	1	1	1	1	1	1	1	0	1	1	1	1	X	2
H. SEMICINCTUS (JUVENILES)	0	0	0	0	0	0		1	1				X	0	0	0	0	0		0
OXYJULIS CALIFORNICA	2	2	2	2	2	2	1	1	2	2	3	1	2	2	2	3	4	3	2	3
O. CALIFORNICA (JUVENILES)	0	3	3	2	0	1	X	2	2	0	3	2	1	1	2	4	3	2	2	3
SEMICOSSYPHUS PULCHER													3		2					
S. PULCHER (FEMALES)	1	2	2	2	1	1	2	1	1	1	3	2	3	2	2	2	3	3	3	3
S. PULCHER (MALES)	1	1	1	2	1	1	1	1	0	0	1	1	3	1	2	0	4	3	3	3
S. PULCHER (JUVENILES)	0	0	0	0	0	1	1	0	0	0	1	1	1	0	1	0	0	3	1	2
CAULOLATILUS PRINCEPS			1	2	1		X	2					X	X	2	2	0	2	1	1
STEREOLEPIS GIGAS											1			1	1			1		1
CHROMIS PUNCTIPINNIS	1	1	2	2	2	2	2	2	1	1	3	3	2	1	4	2	2	2	2	2
CHROMIS PUNCTIPINNIS (JUVENILES)	0	1	0	0	0	0	1	1	2	0	2	1	2	1	3	2	0	0	0	0
HYPYPOPS RUBICUNDUS	0	0	2	0	0	1	2	3	2	1	2	3	3	2	4	2	1	3	1	2
HYPYPOPS RUBICUNDUS (JUVENILES)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	X	0	X
ATRACTOSCION NOBILIS												X								
SCORPAENA GUTTATA			X				X		X		3		X	1	1	1		3		1
SEBASTES SP.																X				
SEBASTES SP. (JUVS.)		1		X								X		1						
SEBASTES ATROVIRENS	2	1	4	2	3	3	1	2	1	1	1	1	2	0	0	1	2	3	2	3
S. ATROVIRENS (JUVENILES)	2	2	2	2	1	2	0	0	0	1	0	2	1	0	0	1	0	0	0	0
SEBASTES CARNATUS	1		X	X		X	X		X			X							X	
SEBASTES CAURINUS	2		X		1	X	X			X										
S. CARNATUS/CAURINUS (JUVENILES)	1	X	1	1		X	X		X	X		X	X							
SEBASTES CHRYSOMELAS	3	3	2	2	1	2	X		X	X				1						
SEBASTES MELANOPS		1																		
SEBASTES MINIATUS	1													0	0	0				
S. MINIATUS (JUVENILES)			X							X										
SEBASTES MYSTINUS	2	2	2	2	3	3	X	0	X	0	0	0	0	0	0	0				
S. MYSTINUS (JUVENILES)	1	0	1	0	0	1	1	0	0	0	1	1	0	0	0	0				
S. PAUCISPINIS (JUVENILES)	1	1	X									X	X							
SEBASTES RASTRELLIGER															1					
SEBASTES SAXICOLA																X				



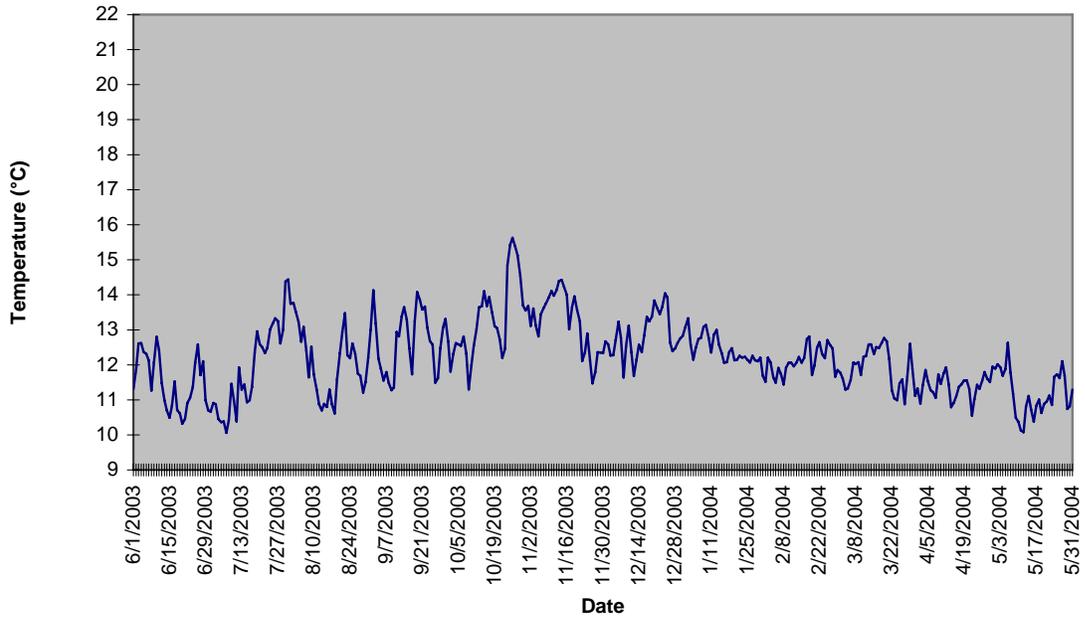


**Appendix L. 2004 Temperature data collected at Channel Islands National Park and San Clemente Island Kelp Forest Monitoring Stations by remote temperature loggers.**

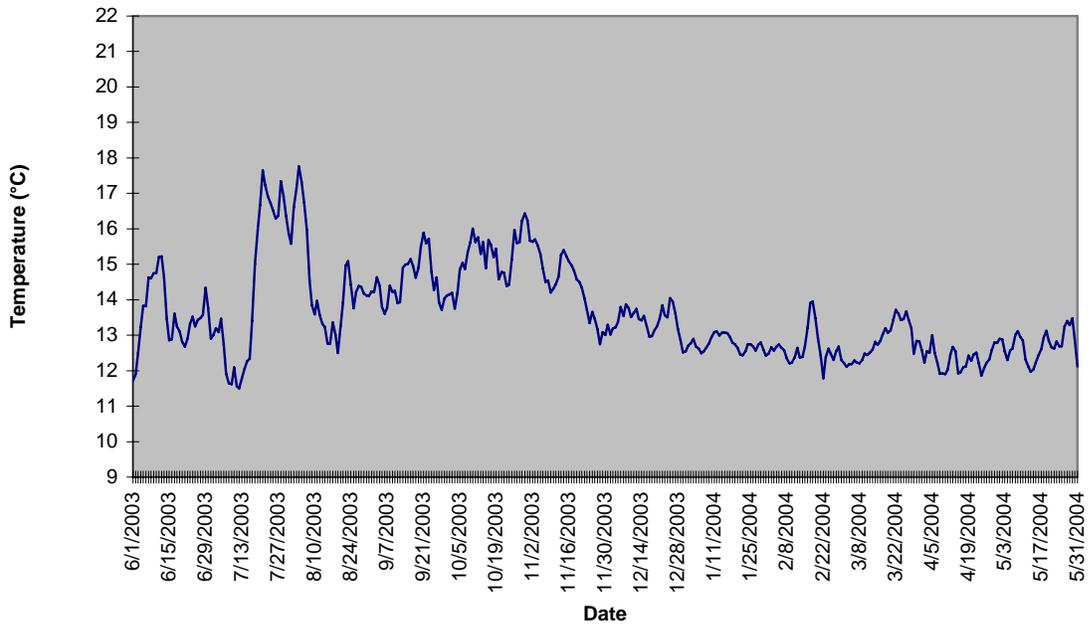
**Introduction:**

**This appendix contains the temperature data (presented graphically) collected by TIDBIT™ temperature loggers that were deployed at all 20 Kelp Forest Monitoring sites. Missing data at some sites is the result of technical problems or loss of temperature logger.**

**WYCKOFF LEDGE, SAN MIGUEL ISLAND**  
Depth = 13 meters

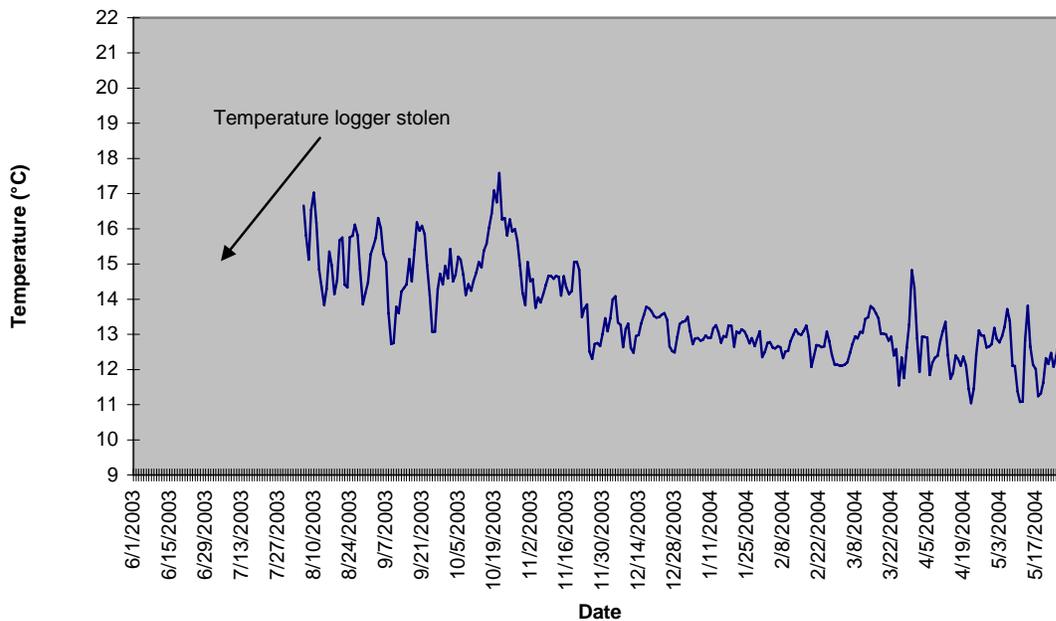


**HARE ROCK, SAN MIGUEL ISLAND**  
Depth = 5 meters



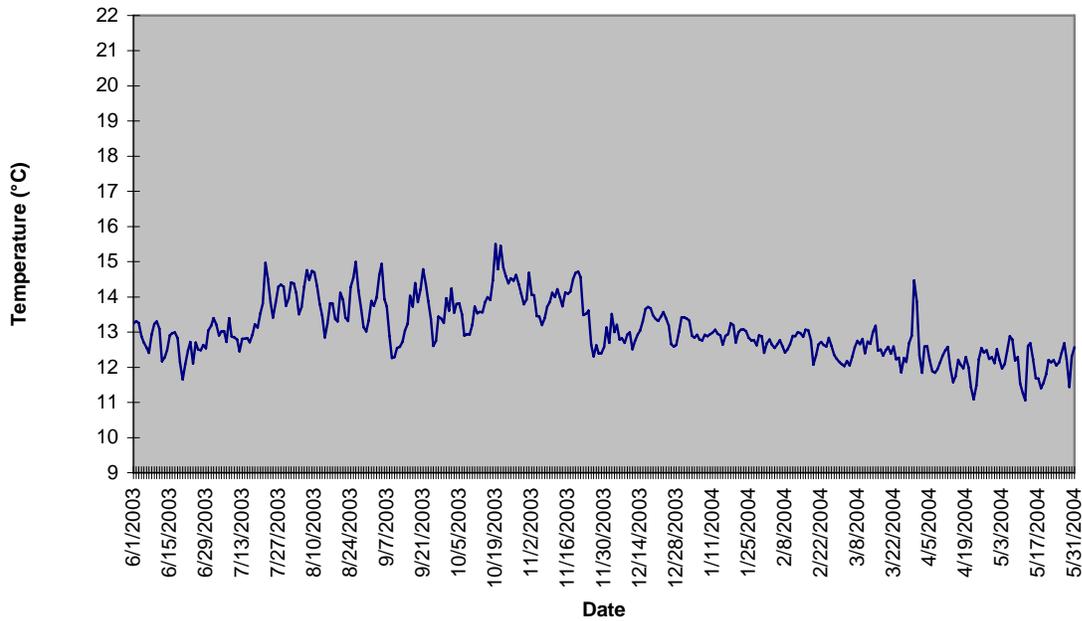
### JOHNSON'S LEE NORTH, SANTA ROSA ISLAND

Depth = 11 meters



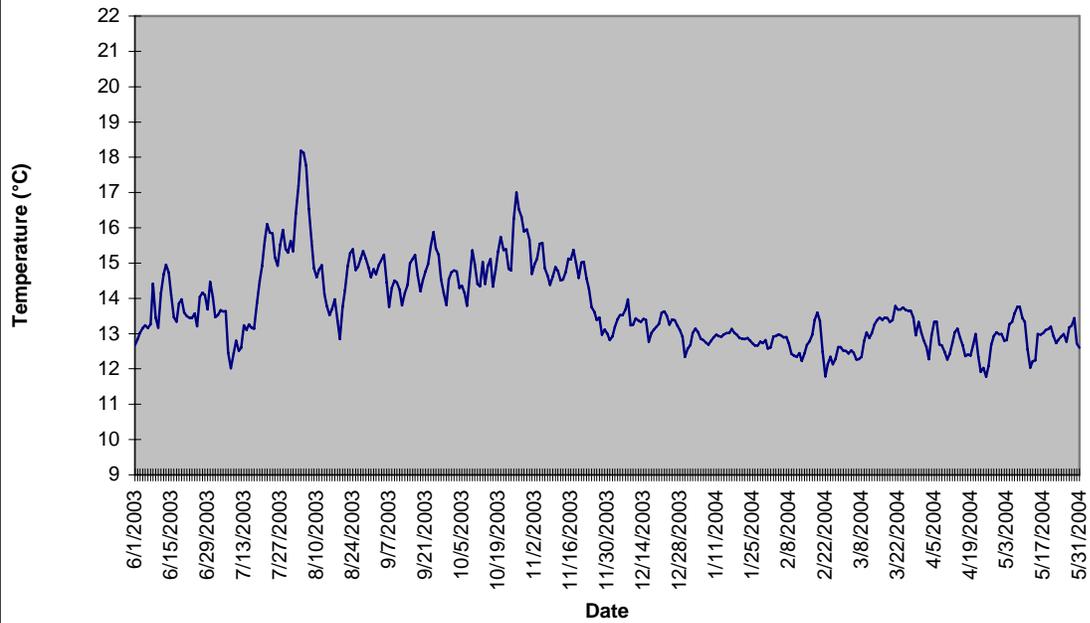
### JOHNSON'S LEE SOUTH, SANTA ROSA ISLAND

Depth = 16 meters



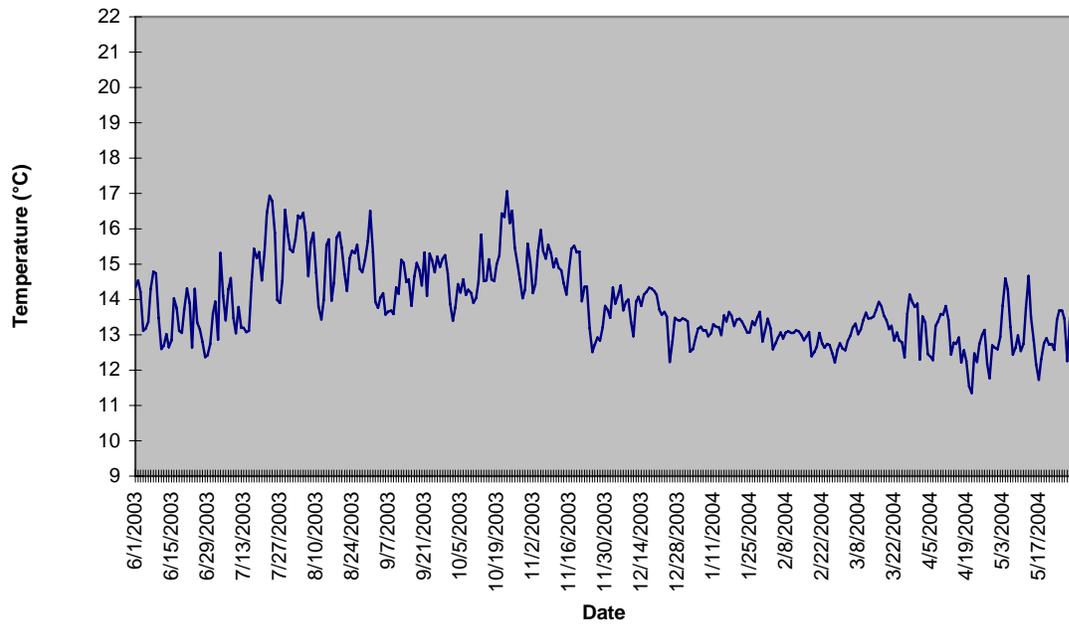
### RODES REEF, SANTA ROSA ISLAND

Depth = 13 meters



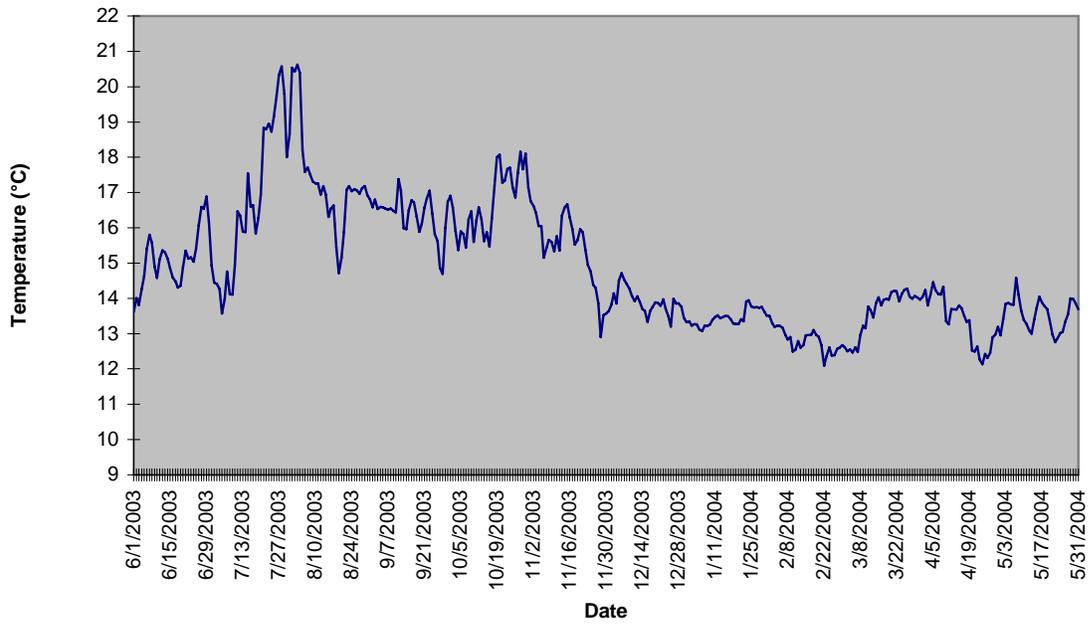
### GULL ISLAND, SANTA CRUZ ISLAND

Depth = 15 meters



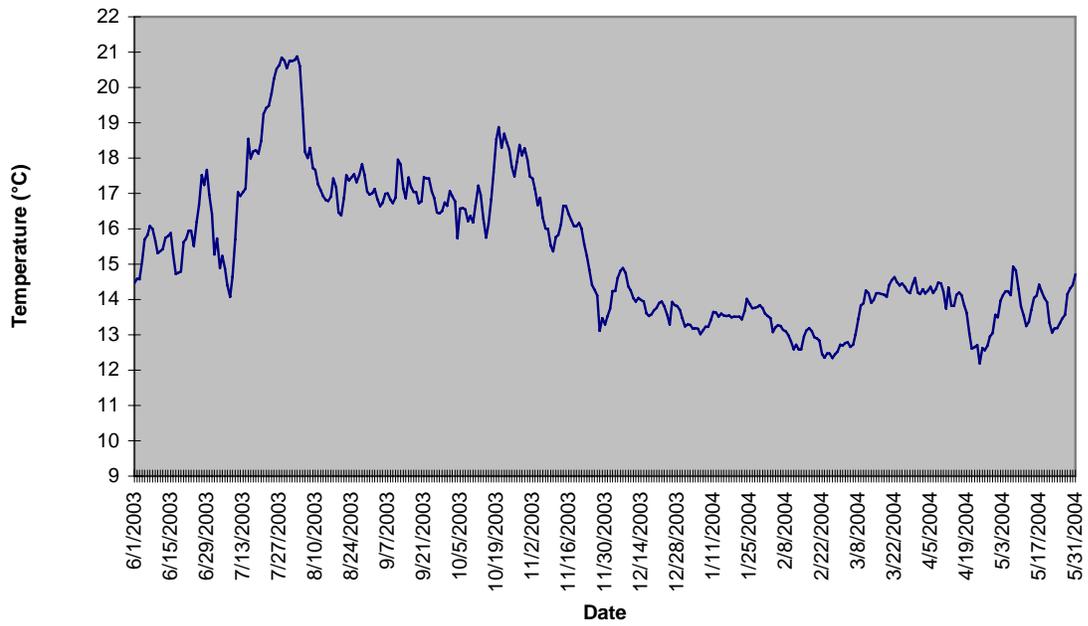
### FRY'S HARBOR, SANTA CRUZ ISLAND

Depth = 13 meters



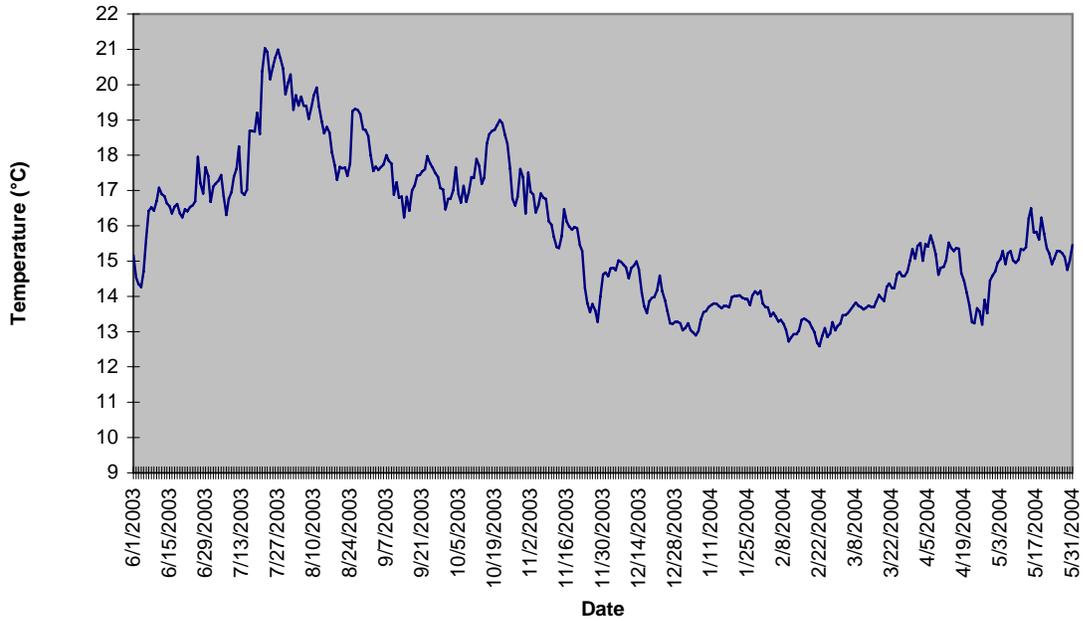
### PELICAN BAY, SANTA CRUZ ISLAND

Depth = 8 meters



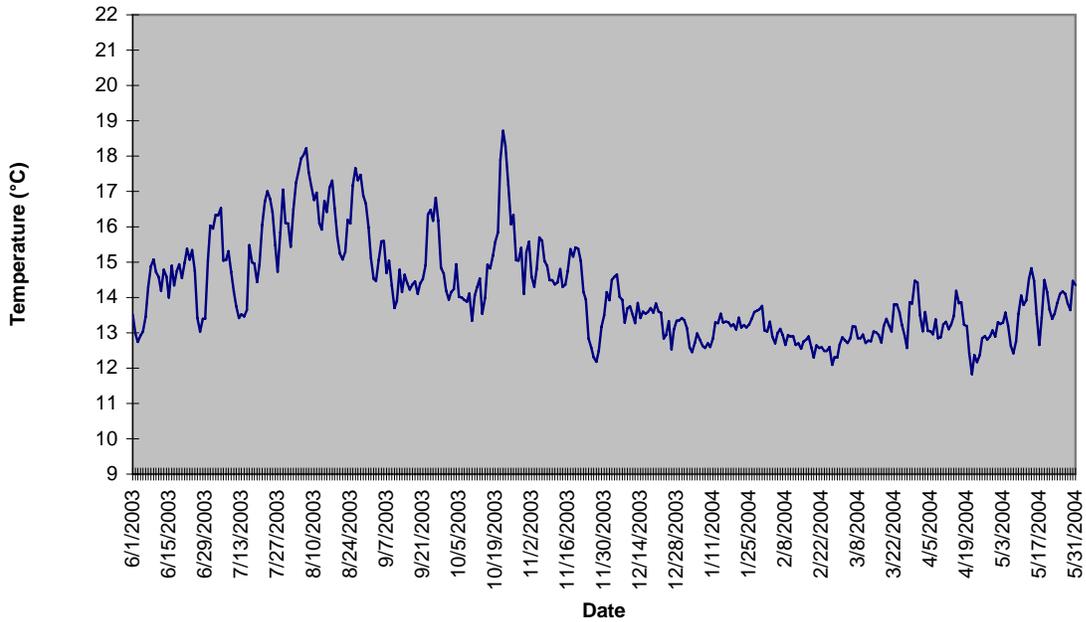
### SCORPION'S ANCHORAGE, SANTA CRUZ ISLAND

Depth = 5 meters



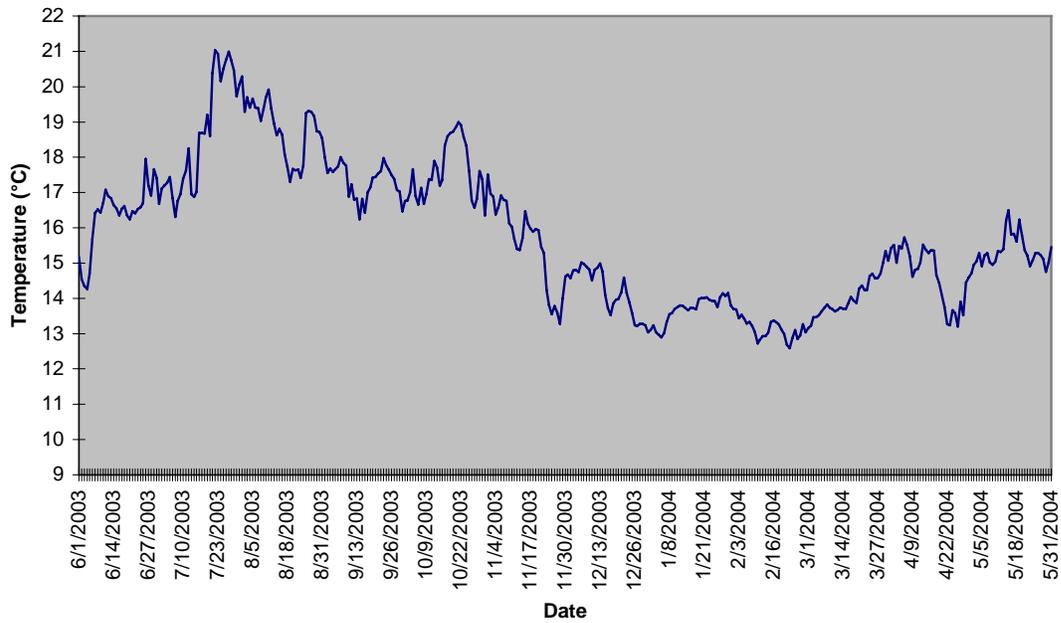
### YELLOW BANKS, SANTA CRUZ ISLAND

Depth = 15 meters



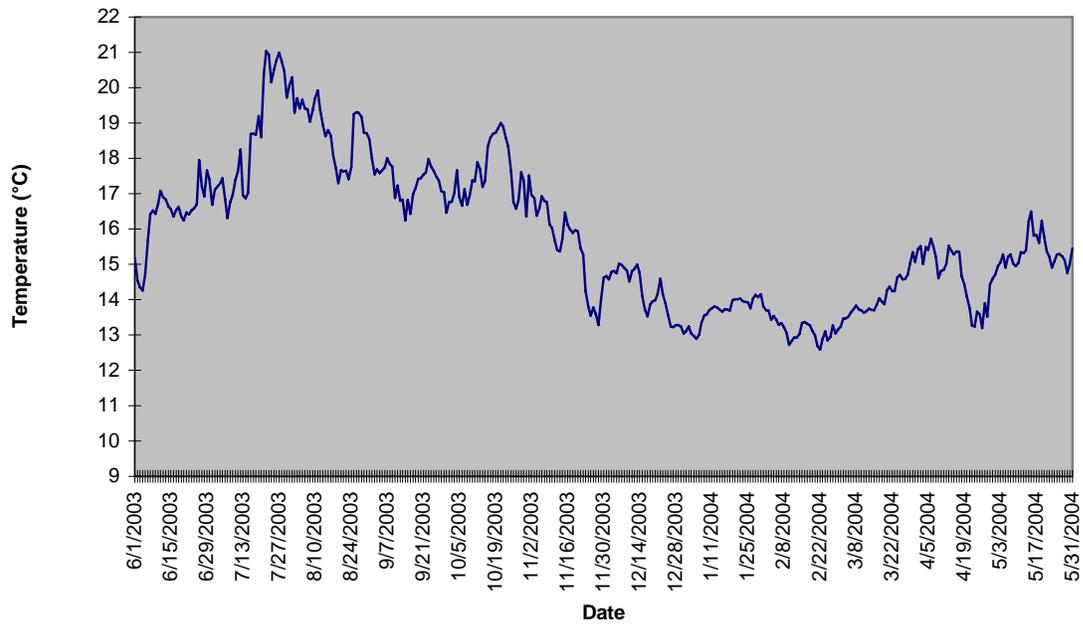
### ADMIRAL'S REEF, ANACAPA ISLAND

Depth = 16 meters

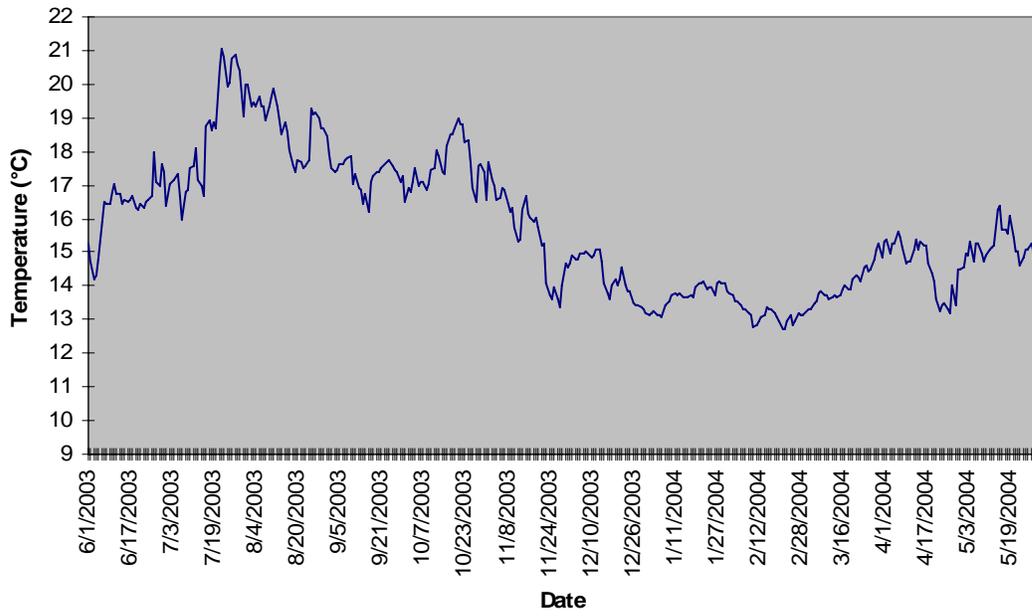


### CATHEDRAL COVE, ANACAPA ISLAND

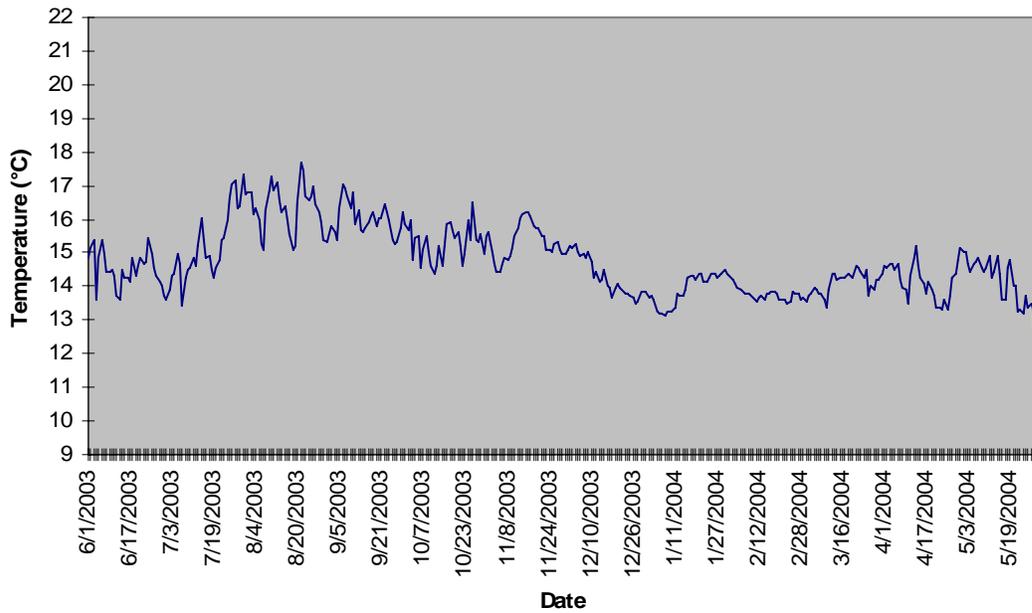
Depth = 6 meters



**LANDING COVE, ANACAPA ISLAND**  
Depth = 5 meters

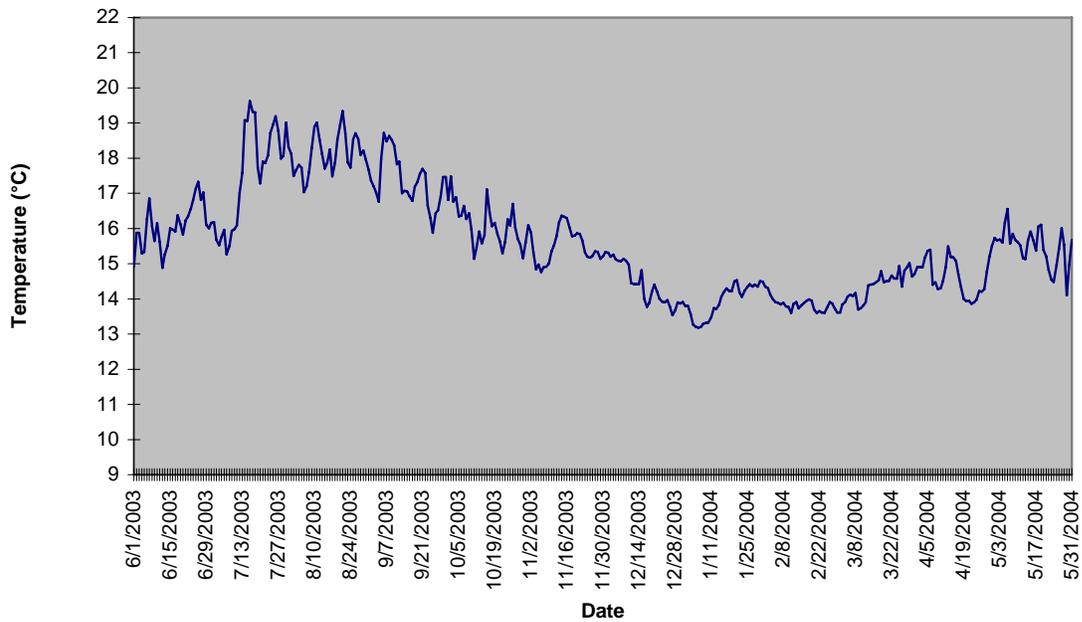


**SOUTHEAST SEA LION, SANTA BARBARA ISLAND**  
Depth = 15 meters



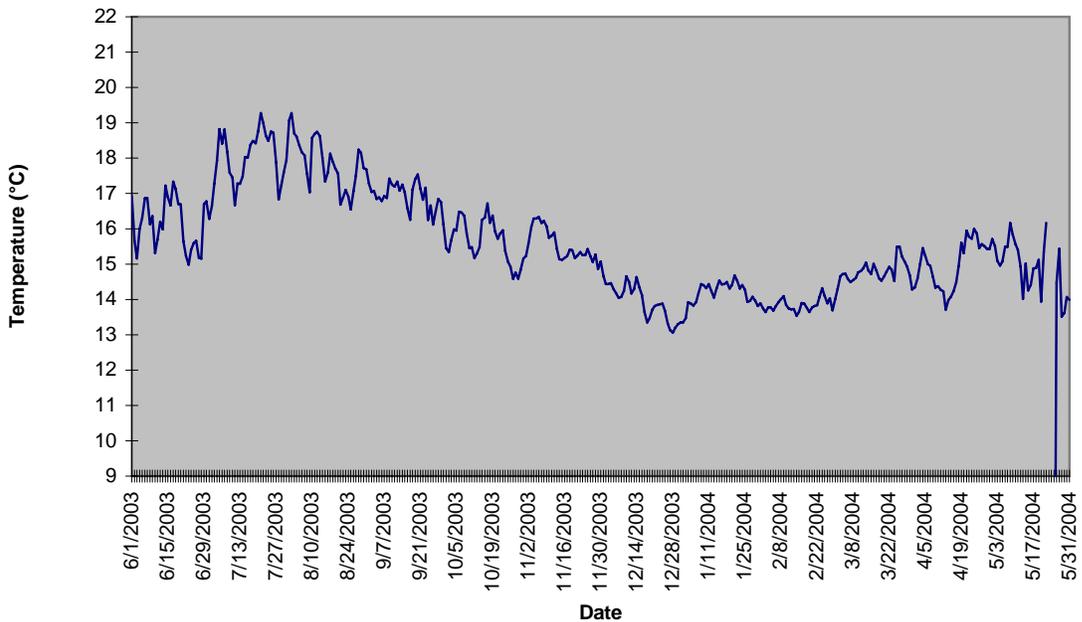
### ARCH POINT, SANTA BARBARA ISLAND

Depth = 8 meters



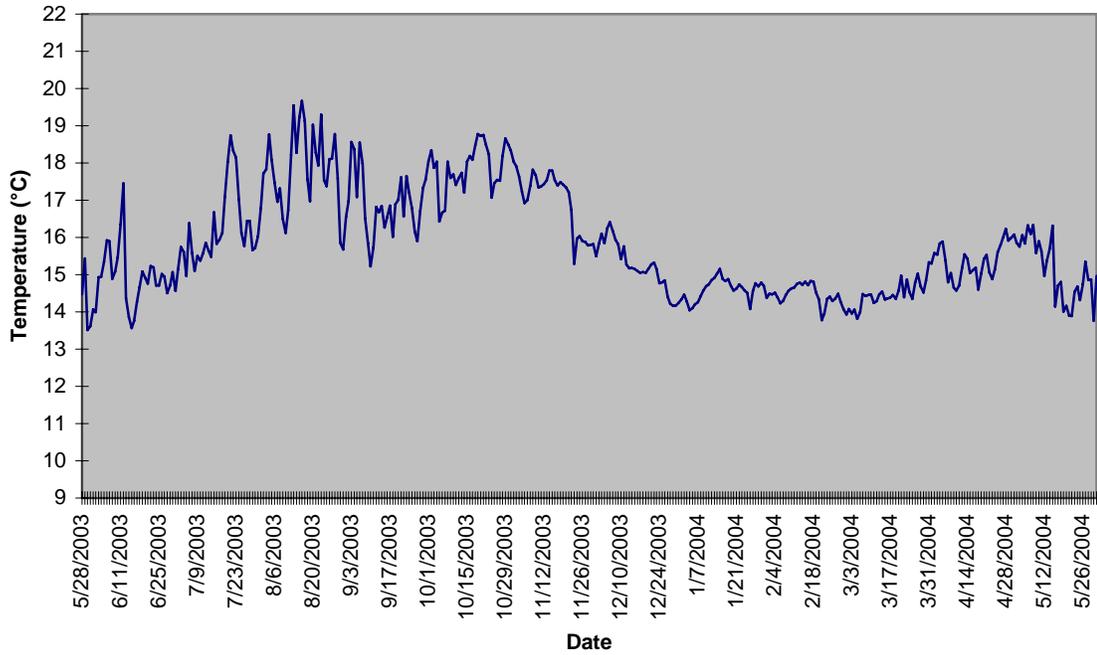
### CAT CANYON, SANTA BARBARA ISLAND

Depth = 8 meters



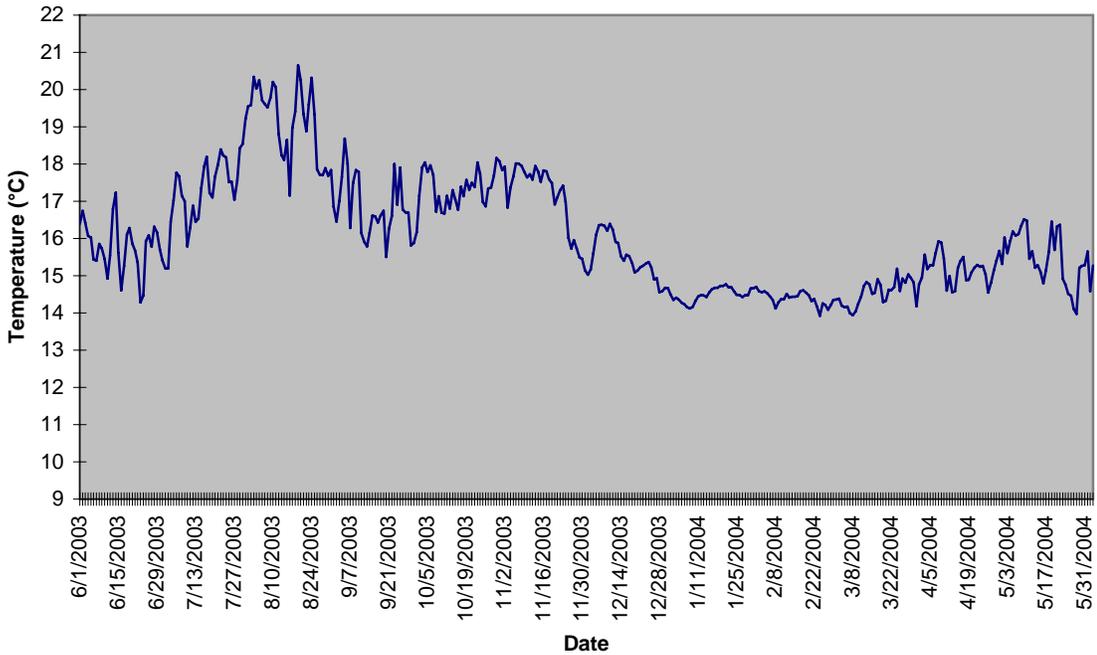
### NORTHWEST HARBOR, SAN CLEMENTE ISLAND

Depth = 11 meters



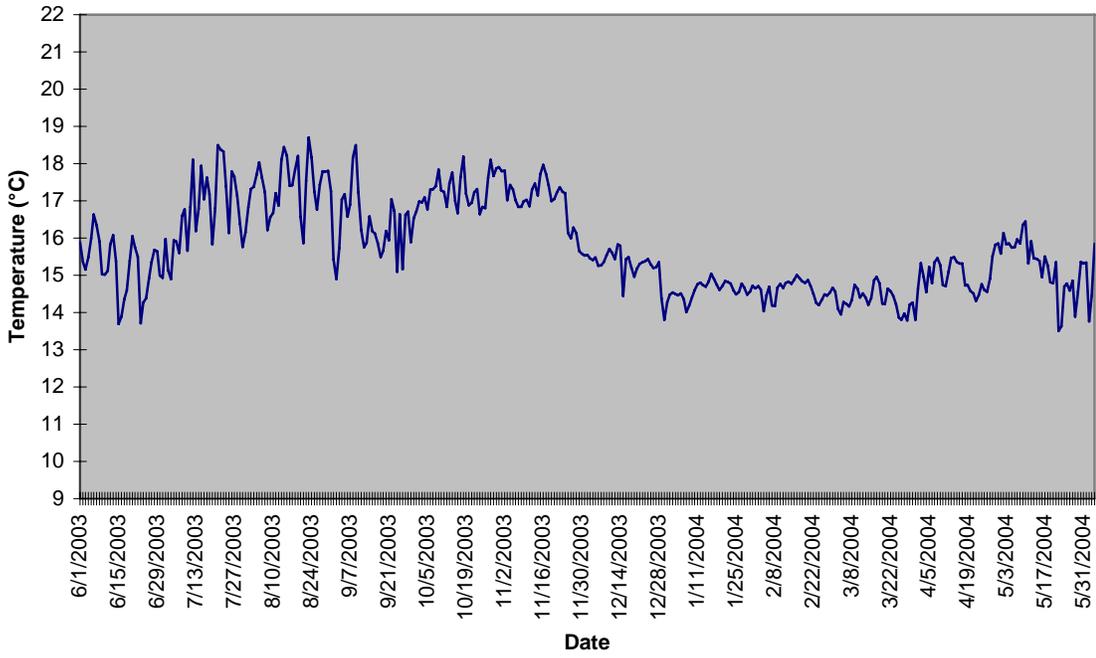
### BOY SCOUT CAMP, SAN CLEMENTE ISLAND

Depth = 11 meters



### EEL POINT, SAN CLEMENTE ISLAND

Depth = 10 meters



### HORSE BEACH COVE, SAN CLEMENTE ISLAND

Depth = 13 meters

