# KELP FOREST MONITORING ANNUAL REPORT 2003

## CHANNEL ISLANDS NATIONAL PARK

**National Park Service**
**Channel Islands National Park**

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# KELP FOREST MONITORING
# 2003 ANNUAL REPORT

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# Table of Contents

# List of Tables



# List of Figures



# Appendices

# ABSTRACT

Observations and results of the 2003 Channel Islands National Park, Kelp Forest Monitoring Project are described. Population dynamics of 68 taxa, or categories, of algae, fish and invertebrates were measured at the 16 original kelp forest monitoring sites and at an additional site Miracle Mile at San Miguel Island. Four additional sites were added and monitored this year at San Clemente Island as part of an agreement with the U.S. Navy. Survey techniques utilized SCUBA and surface-supplied-air, and included quadrats, $5m^2$-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. Of the 16 original kelp forest monitoring sites in 2003, five sites had mature *Macrocystis pyrifera* (giant kelp)forests, five sites had developing kelp forest, four sites were dominated by echinoderms, and two sites were about half kelp forest and half dominated by echinoderms. Of the four sites dominated by echinoderms, two were dominated by *Strongylocentrotus purpuratus* (purple sea urchins), one by *Ophiothrix spiculata* (brittle stars) and *S. purpuratus*, and one by *Pachythyone rubra* (aggregated red sea cucumbers) and *O. spiculata*. Of the two sites that were half kelp forest and half echinoderms, one was dominated by *S. franciscanus* (red sea urchins) and one by *Ophiothrix spiculata.* In addition, the new monitoring site at San Miguel Island, Miracle Mile, was a mature kelp forest. The four sites added to San Clemente Island this year all had mature kelp forests.

# 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 monitored at San Clemente Island, Naval Auxiliary Landing Field, under an agreement with the U.S. Navy. The results of the sampling effort at San Clemente Island are included in this report, and were also supplied to the Navy in a separate report. Sites were monitored during seven five-day cruises and one eight day cruise between May and October. The 2003 kelp forest monitoring was completed at all 21 monitoring sites by 30 National Park Service (NPS) and volunteer divers completing a total of 863 dives with over 713 hours of bottom time. Divers using SCUBA or surface-supplied-air completed all quadrats, $5m^2$-quadrats, band transects, random point contacts, fish transects, roving diver fish counts, size frequencies, artificial recruitment modules (ARMs), video transects and retrieved and deployed temperature loggers. This annual report contains a summary of the methods used to conduct the monitoring in 2003 and a brief description of the sites along with the results. All of the data collected during 2003 can be found summarized in the Appendices of this report.

In 2003, *Macrocystis pyrifera* (giant kelp) forests were present at 17 of the 21 Kelp Forest Monitoring sites. The remaining four were dominated by echinoderms. Pelican Bay and Scorpion Anchorage at Santa Cruz Island were both dominated by *Strongylocentrotus purpuratus*. Fry's Harbor at Santa Cruz was dominated by *Pachythyone rubra* and *Ophiothrix spiculata*. Admiral's Reef at Anacapa Island was dominated by *S. purpuratus* and *O. spiculata*. In addition, two sites with kelp forests also had large areas dominated by echinoderms. Cathedral Cove at Anacapa Island was approximately half sparse kelp forest with areas dominated by *S. franciscanus*. South East Sea Lion at Santa Barbara Island was also approximately half developing kelp forest with the other half dominated by *O. spiculata*. Overall there was noticeably more *M. pyrifera* than in 2002 at all of the five northern Channel Islands.

All three monitoring sites at Santa Barbara Island have incurred noticeable change since 2002. Many of the indicator species at all three sites are at or near their 22 year abundance highs or lows with much of this change being unprecedented since the monitoring program began in 1982. Overall, *Strongylocentrotus purpuratus* densities dramatically declined and this appears to be the driving force of much of the recent change at these sites. At Southeast Sea Lion Rookery, *S. purpuratus* density continued to decline and was near zero, while *Strongylocentrotus franciscanus* density increased slightly. However, overall densities of *Strongylocentrotus spp*. were low for this site and a developing kelp forest was present over half of the site. The remainder of this site continues to be dominated by *Ophiothrix spiculata*. At Arch Point, *S. franciscanus* increased, however *S. purpuratus* dramatically decreased to their lowest density since monitoring began. This year this site was a developing kelp forest. Similarly, Cat Canyon densities of *S. franciscanus* remained about the same while *S. purpuratus* declined to the lowest density recorded at this site and had a developing kelp forest. Similar to the past several years, this Island remains mostly devoid of canopy forming kelp forests and substantial kelp forests were only present in a few small areas around Sutil Island and close to shore in shallow areas predominately on the west side of the Island.

The three KFM sites at Anacapa Island appeared to represent the Island and have changed little from last year, dissimilar to many of the other kelp forest monitoring sites. *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* densities declined at Admiral's Reef while they remained the same at Cathedral Cove and Landing Cove. Algal cover remained about the same at all three sites. As the densities of *Strongylocentrotus spp*. decline at Admirals Reef, this site is more dominated by *Ophiothrix spiculata* and continued to have a low abundance of algae. Landing Cove was a developing kelp forest with high density patches of subadult kelps. Similar to recent years, *S. purpuratus* and *O. spiculata* dominated much of the south side of East Anacapa, and both the south and north sides of middle and West Anacapa Island. Similar to Santa Barbara Island, with the exception of the ecological reserve and

other small patches of kelp forest scattered in shallow areas, much of Anacapa continues to be dominated by echinoderms, although there have been a noted decrease in recent years.

Overall, the monitoring sites at Santa Cruz Island continued the trends experienced in 2002. Declining densities in *Strongylocentrotus spp*. continued and appear to be a major factor in these changes. *Strongylocentrotus purpuratus* densities declined at four sites and remained the same at one, a continuation of the trends observed in 2002. *Strongylocentrotus franciscanus* densities declined at one site and remained the same at four. In 2003, three of the five sites at this Island were dominated by echinoderms, similar to 2002. Gull Island South has experienced rapid change over the past several years with the decline of *Strongylocentrotus spp*. and is now a mature kelp forest. Yellow Banks is clearly on the path of recovery with the status of developing kelp forest. Overall, echinoderms continue to decline at this Island and kelp forests are increasing with notably more kelp around the entire Island this year. We continue to feel that the five monitoring sites well represent the transitions going on at Santa Cruz Island. The western third of the Island is under represented by our monitoring program as there are no sites west of Gull Island and Fry's Harbor. However, there appears to be a similar trend of increasing kelp forests as can be observed from an even denser canopy than last year.

Kelp forests continued to be relatively abundant and continued to increase in abundance and denseness around Santa Rosa and San Miguel Islands. In 2003 mature kelp forests were present at four of the five monitoring sites and the fifth site was a developing kelp forest. In 2002, three sites had kelp forests. *Strongylocentrotus spp*. densities remained relatively low and overall continued to decline. *Strongylocentrotus purpuratus* densities declined at two sites and remained about the same at three. *Strongylocentrotus franciscanus* densities declined at two sites, increased at one site, and remained about the same at two sites. *Pycnopodia helianthoides* remained relatively abundant and they continued to prey upon *Strongylocentrotus spp*. as noted by whole sea urchin tests and are probably the main cause of decline at San Miguel and Santa Rosa Islands. The new monitoring site at San Miguel Island, Miracle Mile remained a mature kelp forest.

This is the first year we monitored the four newly established kelp forest monitoring sites at San Clemente Island. Mature kelp forests encompassed the entire Island where there was appropriate substrate and were present at all four of the monitoring sites. There are many notable differences at the sites on this Island compared to the regularly monitored 16 kelp forest monitoring sites at the northern Channel Islands. Overall, *Strongylocentrotus spp*. densities are lower than at the northern Channel Islands and it was often difficult to find the 200 sea urchins for size frequency measurements. In general, there were few small *Strongylocentrotus spp*. and lack of size cohorts observed at the northern Channel Islands. In addition, there was a higher proportion of legal sized (>83mm) *Strongylocentrotus franciscanus* than at the other Islands. In general, *Asterina miniata*, *Pisaster giganteus* and *Pycnopodia helianthoides* were all noticeably less abundant and had few size cohorts indicating sporadic recruitment. *Crassedoma giganteus* were notably less abundant and *Serpulorbis squamigerus* were noticeably more abundant than at the Northern Islands. *Haliotis corrugata* were noticeably more abundant than the northern Channel Islands and present at all four of the monitoring sites. *Panulirus interruptus* were noticeably more abundant, but appeared smaller than at the northern Channel Islands. The fish populations at this Island were noticeably less diverse than the northern Islands and the majority of the fish consisted of warmer water species such as *Paralabrax clathratus* and *Semicossyphus pulcher*.

# 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 southern most 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. (2001), and Kushner et al. (2006) describe the 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001 and 2002 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 2003, our 22nd 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 tried to provide 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 San Clemente Island (Figure 2). Site and species selection criteria, and sampling protocols are described in detail in the Kelp Forest Monitoring Handbook (Davis et al., 1997). Sites were monitored between May 27$^{th}$ and October 10$^{th}$, 2003, using the NPS vessel "Pacific Ranger". At San Clemente Island, an additional vessel belonging to the California Department of Fish and Game, "Mako", was utilized along with "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. 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 1m x 5m quadrats, and 24 paired 3 m x 10 m band transects were systematically arranged along the transect with a random start, were used to determine densities and distribution of discrete benthic organisms; 600 random non-adjacent points (random point contacts - RPCs) were used to determine percent cover of encrusting invertebrates, algae, and substrate composition; 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/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.

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 counting fish, 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. When fish Counts were made we also entered the appropriate abundance code (S, F, C, or M) into the data base to facilitate comparison to past years.

Pre 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.

Please note that this change in the Roving Diver Fish Count Protocol has not been included in the Kelp Forest Monitoring Protocol Vol. 1 Handbook.

Two TIDBIT$^{TM.}$ 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$^{TM}$ loggers were factory serviced and calibrated and new O-rings were installed in each underwater logger housing in 2003. A comparison of several temperatures from both loggers was made to see if the loggers were recording within their specifications (+- 0.2 $^{o}$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, $5m^2$-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 2003 status of each site is presented in Table 4. Thirty divers (Table 5) collected data on seven five-day cruises and one eight-day cruise between May and October. A total of 863 dives with over 713 hours of bottom time were completed. All prescribed monitoring data were collected in 2003 except for temperature data from Johnson's Lee North (see below). Fish transects, roving diver fish count, species list, and some size frequencies at Miracle Mile were not conducted due to time constraints.

A brief description of each site is included with the station results below. Complete data summaries 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 $5m^2$-quadrats (Appendix B) represent average counts obtained from 40 continuous and adjacent 1m 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 $5m^2$-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 Appendix F contains the number of observers that sampled and a total number of species observed for each sampling date and site. The following pages in Appendix F contain the average timed Score, the average Abundance score and beginning this year an average Count for each sampling date and site. However, Counts were not collected for all dates and sites this year. In addition, at a particular site and date, some observers collected Counts, while others did not. When data are not available, no data (null) are present in Appendix F.

Pre 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. This year in the sites descriptions below we began using the whole counts 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$^{TM}$ temperature loggers. Temperature data are collected from the loggers during our regular sampling season May - October. To expedite report writing we will present 12 months of temperature data from June 1, 2002 to May 31, 2003 (Appendix L). Temperature data were collected from 15 sites, the exceptions being Miracle Mile where there is no logger and the four San Clemente sites which were only established this year. In addition, temperature data could not be collected at Johnson's Lee North because the housing with the loggers had been stolen. For explanations of the missing data, please see the station results below or Appendix L.

## Location: Wyckoff Ledge, San Miguel Island

**Site #1 SMWL**
2003 sampling dates: 9/9, 9/25.
2003 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 covered 100% of the transect. There was an increase in the density of adult *M. pyrifera* and a subsequent decrease in subadults and juveniles. This is typical of a maturing kelp forest. Adult, subadult, and juvenile *M. pyrifera* densities were 0.43/m$^2$, 0.20/m$^2$, and 0.38/m$^2$ respectively, and cover was recorded at 19.0%. *Desmarestia spp*. continued to decrease for the third consecutive year and had a relatively low abundance for this site with a cover of 1.0%. *Cystoseira* sp. were common with a cover of 2.0%, similar to last year. Several adult and juvenile *Eisenia arborea* were observed along the transect. None were observed on quadrats and cover was recorded at 0.67%. Adult *Pterygophora californica* were more abundant than last year and juvenile abundance remained about the same. Their densities were 0.54/m$^2$, and 0.17/m$^2$ respectively, and had a cover of 5.7%. *Laminaria farlowii* were rare with no adult and several juveniles observed with a density of 0.042/m$^2$. Miscellaneous brown algae cover was 5.3%, relatively high for this site. This category consisted mostly of *Dictyoneuropsis reticulata* which were common at the site. Understory red algae cover decreased and was recorded at 24.8%, the lowest cover since 1987. *Gigartina* sp. cover was 0.50%, similar to last year. Articulated coralline algae continued to increase with a cover of 14.5%. Encrusting coralline algae cover was 30.0%, similar to the last several years. Bare substrate cover was 26.2%, similar to past years

The most common miscellaneous invertebrates on random point contacts (RPCs) were the hydroid, *Aglaophenia sp*. Cover of this category was 6.2%, similar to last year. *Diopatra ornata* cover was similar to last year at 10.5%, but has gradually decreased over the past three years. *Phragmatopoma californica* were uncommon and none were observed on RPCs this year. Miscellaneous bryozoans continued their dramatic increase, similar to what we have observed at other sites this year. This category covered 23.5% of the bottom, its highest cover recorded since monitoring began for this category in 1985. Tunicates continued to be relatively abundant and were recorded at 5.1%, the highest cover recorded since monitoring began at this site. *Styela montereyensis* density was 0.17/m$^2$. Sponges were common with a cover of 1.8%. *Tethya aurantia* were abundant with a density of 0.17/m$^2$. *Urticina lofotensis* were abundant on the tops and sides of rocks, with a density of 0.31/m$^2$, similar to previous years.

*Asterina miniata* density was 2.04/m$^2$, higher than last year but similar to previous years. 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 0.25/m$^2$ and 0.015/m$^2$ respectively. Both small and large *Pycnopodia helianthoides* were observed, but they were uncommon with a density similar to last year, 0.0083/m$^2$. Only six *P. helianthoides* were found for size frequency measurements. The leather star, *Dermasterias imbricata*,

was common. *Parastichopus parvimensis* density continued to be low and none were observed on quadrats (0.0/$m^2$) for the second consecutive year.

*Strongylocentrotus franciscanus* density was similar to last year at 7.04/$m^2$, though this is the highest density recorded at this site since monitoring began in 1982, but only slightly higher than last year. *Strongylocentrotus purpuratus* density was similar to last year at 0.75/$m^2$, the lowest recorded since 1998. Juvenile *Strongylocentrotus spp.* were uncommon. No *Lytechinus anamesus* were observed on band transects, 0.0/$m^2$. No sea urchin or sea star wasting disease was observed.

*Kelletia kelletii* were abundant, with both small and large individuals present similar to previous years. They were counted on both band transects and quadrats, with densities of 0.16/$m^2$ and 0.46/$m^2$ respectively, similar to previous years. *Kelletia kelletii* eggs were common, but not as abundant as last year. *Lithopoma gibberosum* were common within the transect area, but there were few directly along the transect and none were observed in quadrats this year with a density of 0.0/$m^2$.

*Haliotis rufescens* were mostly in crevices but there were a few out in the open. Their density remained high and was only slightly higher than last year at 0.0597/$m^2$, but similar to last year. Fresh *H. rufescens* shells were uncommon. Rock crabs, *Cancer* spp. were common and crab traps were common around the reef that this transect is on. We counted rock crabs, *Cancer* spp. (either *C. antennarius* or *C. productus*) on band transects this year. Two were counted; one on each of two band transects (0.0028/$m^2$). *Cancer spp.* are not one of our indicator species so this information is not included in the database. The kelp crab, *Pugettia productus*, was common. *Idotea resecata* were abundant on the *Macrocystis pyrifera* stipes.

As usual, fish were more abundant on the western end of the transect. Diversity was higher than last year. The most abundant fish along the transect were tubesnouts, *Aulorhynchus flavidus*. Divers estimated their abundance with a range of 5,750 – 16,000 on September 25th. No *Chromis punctipinnis* were observed during the fish counts. Adult and juvenile *Embiotoca jacksoni* were present in small numbers with two and five observed respectively. Adult and juvenile *Embiotoca lateralis* were common with up to 18 and seven observed respectively. Adult and juvenile *Damalichthys vacca* were common with three and eight observed respectively. Two female and one large male *Semicossyphus pulcher* were observed on the fish counts this year. *Oxyjulis californica* were relatively uncommon with only five adults observed. Painted greenlings, *Oxylebius pictus*, were common with 20 observed. Juvenile *Sebastes* spp. were relatively abundant in the kelp canopy and on the bottom. A large school (116) of juvenile Bocaccio, *Sebastes paucispinis*, was observed in the kelp canopy. Juvenile *S. paucispinis* were observed during both fish counts this year. Juvenile *Sebastes caurinus/carnatus* were common with 15 observed. Thirty four adult and 13 juvenile *Sebastes mystinus* were observed. Six adult and 37 juvenile *Sebastes atrovirens* were observed. Adult *Sebastes serranoides* were uncommon with only one observed during a fish count. At least five 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. Adult black and yellow rockfish, *Sebastes chrysomelas*, were common with 11 observed. Two adult and one juvenile *Sebastes serriceps* were observed. Lingcod, *Ophiodon elongatus*, were common with up to five observed. *Coryphopterus nicholsii* were noticeably abundant for this site and had a density of 0.46/$m^2$, the highest density recorded at this site since monitoring began for this species in 1985. Roving diver fish counts were conducted on September 9th with four divers and on September 25 with five divers observing 24 species and 29 species of fish, respectively.

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

## Location: Hare Rock, San Miguel Island

**Site #2 SMHR**
2003 sampling dates: 9/11, 9/25.

2003 status: Mature kelp forest.

This site has changed dramatically since our last visit in 2002 when it was dominated by *Strongylocentrotus franciscanus*. Typically, when a site is dominated by sea urchins, such as Hare Rock has been mostly over the past 20 years, we observe a gradual change to a mature kelp forest. This has not been the case with this site. There was little to no indication that this site was going to change from being dominated by sea urchins. During our last visit in 2002, *Macrocystis pyrifera* were virtually absent. In the past 12 months, densities of *Strongylocentrotus* spp. have declined and most of the site has large mature canopy forming *M. pyrifera* plants with a moderate amount of understory algae.

*Macrocystis pyrifera* canopy cover was estimated at 65% on September 11th. This was the first time a significant amount of canopy covered the site in over 20 years. Most of the *M. pyrifera* plants at the site were large adult plants but subadults and juveniles were also common and all three of these categories were recorded at their highest densities since monitoring began for this species at this site in 1983. Adult, subadult, and juvenile densities were 0.14/$m^2$, 0.11/$m^2$, and 0.67/$m^2$ respectively and cover was recorded at 11.2%. Understory algae cover was higher than it has ever been recorded at this site. Green algae consisting entirely of *Ulva sp*, was the most common and covered 51.0% of the bottom, the highest cover ever recorded at this site. *Ulva sp.* is typically common in the calm areas near Hare Rock such as in Cuyler Harbor, and have been common at this site in past years. However, the highest cover for this category prior to this year was 19.1% in 1990. *Desmarestia sp.* were relatively abundant with a cover of 15.7%, the highest cover recorded but similar to what was recorded in 1990. Several adult and juvenile *Eisenia arborea* were present with densities of 0.042/$m^2$ and 0.083/$m^2$ respectively, none of the plants were observed on RPCs. Several small *Pterygophora californica* were present at the site, but none were observed in quadrats and cover was recorded at 0.17%. Miscellaneous red algae cover was 8.0%, lower than the previous two years. The red alga *Laurencia pacifica* was noticeably less abundant than in recent years. Encrusting coralline algae covered 48.3%, similar to previous years. Articulated coralline algae were uncommon at 0.83%, similar to previous years. Miscellaneous plants (typically filamentous brown diatoms) were uncommon with none observed on RPC's, the lowest cover recorded in the past decade. Bare substrate covered 18.8%, similar to recent years at this site.

The most common miscellaneous invertebrates on RPCs were the worm *Spirorbis sp*., terebellid worms, and hydroids. This category covered 10.3% of the bottom, an increase from last year. *Spirorbis sp.* were noticeably more abundant than usual, similar to what we have observed at some of the other sites this year. *Corynactis californica* continued to decline in abundance with a cover of 2.0%, relatively low for this site. *Balanophyllia elegans* and *Astrangia lajollaensis* covered 0.17% and 0.33% of the bottom, respectively. *Tethya aurantia* density was 0.024/$m^2$, similar to the past two years. Bryozoan cover continued to increase with a cover of 29.3%, by far the highest cover recorded at this site since monitoring began for this category in 1985. Most of the bryozoans at this site were *Membranipora spp*. *Diaperoecia californica* cover was 1.3%, similar to last year. Tunicate cover was 0.5%.

*Strongylocentrotus purpuratus* density continued to decline for the third consecutive year and was recorded at 1.13/m2, the lowest density since 1997. *Strongylocentrotus franciscanus* declined to 3.13/m2, the lowest density recorded at this site since monitoring began in 1992. The density was above 10.0/m2 for the previous 8 years. *Strongylocentrotus franciscanus* have typically been evenly distributed at this site. However, this year they were often in large aggregations known as feeding fronts. From the number of *S. franciscanus* present at this site it was difficult to imagine that densities have actually declined as much as the data indicates. It is possible that the decline was in part a result of the sea urchins being in these aggregated feeding fronts. Whole *Strongylocentrotus spp*. tests were common and probably a result of *Pycnopodia helianthoides* predation. However, *S. franciscanus* tests were not as abundant as one would expect from the decline in density. Juvenile *Strongylocentrotus spp*. were present, but not particularly common. No sea urchin wasting disease was observed.

*Asterina miniata* was abundant and its density was similar to the last two years at 1.83/$m^2$. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.25/$m^2$ and 0.29/$m^2$ respectively, a decline from last year. *Pycnopodia helianthoides* remained moderately abundant, but its

density continued to decline and was recorded at 0.051/$m^2$. *Parastichopus parvimensis* was uncommon and very large, similar to previous years. None were observed on quadrats this year. No sea star wasting disease was observed.

Small fresh *Haliotis rufescens* shells remained relatively uncommon, similar to the previous two years. One small *H. rufescens* was observed on band transects, 0.0014/$m^2$. *Kelletia kelletii* were present in low numbers with a density of 0.0014/$m^2$. *Crassedoma giganteus* density was 0.0056/$m^2$, similar to recent years. *Aplysia californica* density was 0.0056/$m^2$, similar to recent years. *Cypraea spadicea* density dramatically declined to 0.042/$m^2$, the lowest density recorded at this site since monitoring began for this species in 1983. However, we observed several small (about 10) aggregations of *C. spadicea* feeding.

We counted rock crabs, *Cancer* spp. (either *C. antennarius* or *C. productus*) on band transects this year. Two were counted, one on each of two band transects. These are not one of our indicator species so this information is not included in our database.

Though fish diversity at this site was similar to 2002, fish were notably more abundant. *Sebastes spp*. were abundant and diverse. *Sebastes mystinus* were abundant with up to 31 adults and 61 juveniles observed. *Sebastes atrovirens* were common with up to eight adults and six juveniles observed. Adult *Sebastes serranoides* were common with up to six observed. Juvenile *Sebastesserranoides/flavidus* were also common with up to 19 observed. One adult and one juvenile *Sebastes serriceps* were observed. KGBs (*Sebastes caurinus/carnatus*) were common with up to 22 observed. Three adult black rockfish, *Sebastes melanops* were observed. All three of these were observed by David Osorio an expert fish surveyor that conducts much work north of Pt. Conception where both *S. melanops* and *Sebastes mystinus* are common. It is most likely the case that the other observers misidentified the *S. melanops* as *S. mystinus*. Two adult *Sebastes caurinus* (copper rockfish), and one adult *Sebastes carnatus* (gopher rockfish) were observed. Adult *Sebastes chrysomelas* were common with up to six observed, but they seemed less abundant than last year. Juvenile *Sebastes paucispinis* (Bocaccio) were present in small numbers during both visits to the site, but no more than six were observed. Large adult *Chromis punctipinnis* were more common on September 25$^{th}$ than on the 11$^{th}$ with up to 55 observed, no juveniles were observed. Five adult and seven juvenile *Embiotoca jacksoni* were observed. Twenty six adult and 12 juvenile *E. lateralis* were observed. Adult *Oxyjulis californica* were moderately abundant with up to 150 observed. One male and five female *Semicossyphus pulcher* were observed. Twenty six *Oxylebius pictus* were observed. Ronquils were less abundant than in recent years with only one observed. Two *Ophiodon elongatus* (lingcod) were observed. One adult and two juvenile (about 10cm) *Scorpaenichthys marmoratus* (cabezon) were observed. A school of about 100 *Aulorhynchus flavidus* (tubesnouts) was observed. *Coryphopterus nicholsii* were common with a density of 0.25/$m^2$. One *Alloclinus holderi* was observed this year. Roving diver fish counts were conducted on September 11$^{th}$ with four observers and on September 25$^{th}$ with four observers observing 24 and 29 species respectively.

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

## Location: Miracle Mile, San Miguel Island

**Site #21 SMMM**
2003 sampling dates: 9/10.
2003 status: Mature kelp forest.

Please 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, in conjunction with the County of Santa Barbara, and with the assistance of Channel Islands National Park. The monitoring site was set up to specifically look at a *Haliotis rufescens* population in an area of high density. The site was specifically selected for its high density of *H. rufescens*.

We were able to complete 5-meter quadrats, quadrats, band transects, random point contacts, size frequencies for *Haliotis rufescens, Macrocystis pyrifera*, and sample all of the ARMs that were intact (six). We did not have time to complete any of the other monitoring such as fish transects, roving diver fish count and other size frequency measurements.

There were noticeably more *Macrocystis pyrifera* and other understory algae at this site than has been seen since it was established in 2001. *Macrocystis pyrifera* canopy cover was higher than we have seen it and it was estimated to cover 90% of the transect and was thick and healthy. Adult, subadult, and juvenile densities were recorded at their highest levels since 2001, 0.24/$m^2$, 0.89/$m^2$, and 3.4/$m^2$ respectively, and cover was 25.2%. Understory algae were abundant and consisted mostly of *Desmarestia sp., Eisenia arborea, Pterygophora californica*, miscellaneous red algae, and green algae. *Desmarestia* covered 23.7% of the bottom. *Cystoseira* spp. covered 1.0% of the bottom. Adult and juvenile *E. arborea* were abundant with densities of 0.54/$m^2$, and 2.21/$m^2$ respectively and a cover of 19.0%. Adult and juvenile *P. californica* were also abundant with densities of 1.63/$m^2$ and 7.79/$m^2$ respectively and a cover of 27.5%. Miscellaneous red algae covered 37.5% of the bottom. *Gigartina sp*. cover was 3.5%. Green algae cover was recorded at 13.0%. Articulated and encrusting coralline algae covered 23.2% and 51.8% respectively. Bare substrate cover was 13.0%.

The most common miscellaneous invertebrates on RPCs were hydroids. This category covered 4.67% of the bottom. *Telia lofotensis* were abundant with a density of 0.16/$m^2$, similar to the past two years. *Tethya aurantia* were abundant with a density of 0.12/$m^2$, similar to the past two years. Sponges and tunicates were abundant covering 6.0% and 11.0% of the bottom respectively. *Balanophyllia elegans* cover was 2.0%. Miscellaneous bryozoans cover was 10.3%.

*Strongylocentrotus franciscanus* were abundant with a density of 6.58/$m^2$, a small decrease from the previous two years. *Strongylocentrotus purpuratus* density continued to decline and was recorded at 0.92/$m^2$. *Asterina miniata* density continued to increase and was recorded at 2.58/$m^2$. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.67/$m^2$ and 0.24/$m^2$ respectively. *Pycnopodia helianthoides* density was 0.026/$m^2$, the same as last year. *Parastichopus parvimensis* was recorded at a higher density of 0.42/$m^2$. None were observed on quadrats the previous two years.

*Haliotis rufescens* were counted on both band transects and quadrats. Quadrats are not the proper protocol for this species, but 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 0.647/$m^2$ and 0.292/$m^2$ respectively and both represent a decline. *Haliotis rufescens* density on band transects have continuously declined since this site was established in 2001. This is not surprising since the transect was installed an area that appeared to have the highest density of *H. rufescens*. Though fresh *H. rufescens* shells are common, they do not appear to be unusually abundant considering the density of live abalone. It is interesting to note that if you split the transect in two with band transects #1-6 designating the eastern half of the transect and #7-12 designating the western half, then there has been little overall change in *H. rufescens* density on the eastern half, but much change in density on the western half. In addition, this decline on the western half has been gradual over the past two years.

No *Lithopoma undosum* were observed this year, a decline from the past two years. *Lithopoma gibberosum* density was 0.083/$m^2$. *Kelletia kelletii* were observed on band transects for the first time at this site and had a density of 0.0083/$m^2$. *Megathura crenulata* were relatively abundant at a density of 0.090/$m^2$, similar to the past two years. *Crassedoma giganteum* density was 0.0069/$m^2$, similar to the past two years. We counted rock crabs, *Cancer* spp. (either *C. antennarius* or *C. productus*) on band transects this year. Three were counted, one on each of three band transects. These are not one of our indicator species so this information is not included in the database.

*Coryphopterus nicholsii* were uncommon along most of the transect with a density of 0.083/$m^2$, similar to previous years. No fish transects or roving diver fish counts were conducted due to the lack of time.

Six of the intact ARMs were sampled this year for all indicator species. One ARM had moved inshore about ten feet, was on its side wedged between a rock and its bricks were spilling out of a hole. We did not have the time to repair and reestablish this ARM. It looked like it may remain where it is for awhile. The remaining six ARMs (#s 1,2,3,4,7,and 8) were in excellent condition and remaine well attached to the bolts they were place on (these ARMs are bolted to the substrate with one bolt).

*Haliotis rufescens* density in the ARMs was 1.67/ARM, similar to last year. Most of the abalone found in the ARMs were small and 50% of the abalone found were below 45mm, similar to last year. *Crassedoma giganteum* density was 0.17/ARM. *Asterina miniata* were abundant in the ARMs with a mean of 9.33/ARM and a mean size of 34mm, similar to last year. Fewer *Pisaster giganteus* were found in the ARMs this year with a density of 1.0/ARM (in 2002 there were 5.0/ARM). *Pycnopodia helianthoides* density was 0.5/ARM. *Strongylocentrotus franciscanus* abundance in the ARMs was similar to last year with a mean of 8.83/ARM. Mean size increased to 48mm with a lower percentage below 15mm, possibly indicating lower recruitment than in 2002. There were fewer *S. purpuratus* in the ARMs this year and their mean size remained the same. Their density was 7.33/ARM with a mean size of 52mm.

No temperature loggers are deployed at this site.

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

**Site #3 SRJLNO**
2003 sampling dates: 8/6, 9/23, 9/24.
2003 status: Mature kelp forest.

This site was similar to last year and could be described as a mature kelp forest. *Macrocystis pyrifera* canopy cover over the transect was estimated at 75% and was not very thick. *Adult M. pyrifera* density was similar to last year while subadult and juvenile density and percent cover decreased. The latter decreases in abundance are expected for a maturing kelp forest. Adult, subadult, and juvenile densities were 0.80/$m^2$, 0.23/$m^2$, and 0.33/$m^2$ respectively and cover was 33.0%. Overall, understory algae cover was lower than last year. Adult and juvenile *Eisenia arborea* were common on the top of the ledge that runs parallel to the transect, but few were in the quadrats for a density of 0.042/$m^2$ and 0.0/$m^2$ respectively and a cover of 0.0%. Adult and juvenile *Pterygophora californica* were common with densities of 0.17/$m^2$ and 0.42/$m^2$ respectively and a cover of 0.83%. Most of the adult *P. californica* were small and not mature. No *Laminaria farlowii* were observed on quadrats or RPCs. Small *Cystoseira* sp. were moderately abundant, but not as abundant as last year. Most of these plants were growing on the inshore side of the transect and there were not as many directly along the transect. Cover of *Cystoseira* sp. was lower than last year at 2.7%. No *Desmarestia* sp., green algae, or miscellaneous brown algae were observed on RPCs this year. *Gigartina* spp. (mostly *G. corymbifera*) were notably more abundant than last year with a cover of 1.5%, and most plants were small. Similar to other sites this year, filamentous diatoms recorded under the miscellaneous plants category were uncommon, and there were none observed on RPCs this year (0.0%). Articulated coralline algae coverage remained relatively low at 1.8%. Encrusting coralline algae cover continued to decrease and was recorded at 5.8%, the lowest cover since 1995. This decrease is probably a result of an increase in tunicates at this site. Bare substrate cover increased and was recorded at 6.5% of the bottom.

Miscellaneous invertebrate cover decreased to 8.8%. This category consisted mostly of amphipod tube mats and hydroids. There were noticeably more amphipod tube mats than we have observed in many years at this site, and this is similar to what we have observed at many of the other sites this year. The increase in tunicates at this site was probably the most noticeable change. Tunicates were abundant with an increase in cover to 37.3%, by far the highest cover recorded at this site since monitoring began in 1982. The colonial Elephant ear tunicate, *Polyclinum planum*, was the most noticeable and I have never seen so many anywhere. Most were small, but large colonies were also present. *Pycnoclavella stanleyi*, *Tridemnum / Didemnum*, and *Cystodytes lobatus* were also common. *Styela montereyensis* were abundant with a density of 6.1/$m^2$, their highest density recorded at this site since monitoring began in

1982. Most of these were small recent recruits. The spiky head tunicate, *Boltenia villosa*, was also relatively abundant similar to last year. Sponges covered 1.2% of the bottom. *Tethya aurantia* were abundant at 0.12/$m^2$, similar to recent years. *Phragmatopoma californica* cover was 5.8%, similar to last year. Bryozoans remained abundant with a cover of 30.3%, similar to last year. *Diaperoecia californica* cover was 1.2%, higher than the last several years. The bryozoan *Hippodiplosia insculpta* was noticeably abundant and often observed growing on *Cystoseira* sp. The encrusting bryozoan, *Membranipora* sp. was also abundant. *Corynactis californica* were common with a cover of 4.3%, similar to last year. *Balanophyllia elegans* and *Astrangia lajollaensis* covered 3.2% and 1.7% of the bottom respectively.

Both *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* densities remained low and were similar to last year at 0.042/$m^2$ and 2.46/$m^2$ respectively. *Strongylocentrotus purpuratus* were rare and few were observed along the entire transect similar to last year. The few *S. purpuratus* that were present were typically in small depressions on the tops of rocky reef areas similar to what we observed last year. Similar to last year, *S. franciscanus* were more abundant than *S. purpuratus* and were mostly in cracks and crevices. Overall, there were few juvenile *Strongylocentrotus* spp. No sea urchin wasting disease was observed.

*Pycnopodia helianthoides* density continued to decline for the second year, but remained relatively abundant with a density of 0.094/$m^2$. Both small and large *P. helianthoides* were common. *Asterina miniata* density continued to increase for the third consecutive year and was recorded at 0.50/$m^2$, the highest density recorded since 1997. *Pisaster giganteus* densities remained high similar to the last several years. They were counted on both quadrats and 5-meter quadrats with densities of 0.54/$m^2$ and 0.36/$m^2$ respectively. *Parastichopus parvimensis* density remained low and was 0.042/$m^2$. No sea star wasting disease was observed this year.

*Cypraea spadicea* density was higher than last year, but similar to the previous year and was recorded at 0.38/$m^2$. No *Lithopoma undosum* were observed along the transect this year. *Kelletia kelletii* were relatively rare with a density of 0.0014/$m^2$, similar to previous years. *Megathura crenulata* were uncommon with a density of 0.0083/$m^2$, relatively low compared to the last several years. Similar to last year, two *Haliotis rufescens* were observed on band transects for a density of 0.0028/$m^2$. Six *H. rufescens* were measured for size frequencies, measuring 37, 39, 64, 70, 90, and 126mm, indicating some recruitment over the past several years. David Kushner thinks that the *H. rufescens* population at this site has a good chance of rebuilding itself over the next several years.

Similar to the last two years, fish were abundant and diverse. Adult *Chromis punctipinnis* were common with 90 observed, but no juveniles were observed. Adult *Hypsypops rubicundus* were noticeably more abundant than we have seen at this site. There were six observed along the transect. The adult with the nest at meter 72 was there as usual as he has been since about 1990. No *Halichoeres semicinctus* were observed. Seventeen adult *Oxyjulis californica* were observed. *Semicossyphus pulcher* were abundant with three small males and 21 small females observed. Two male *Halichoeres semicinctus* were observed. Nine adult and 33 juvenile *Sebastes serranoides* were observed. Twelve juvenile and nine adult *Sebastes mystinus* were observed. Adult *Sebastes atrovirens* were moderately abundant with 22 observed. Juveniles were rare with only one observed. Two adult and six juvenile *Sebastes serriceps* were observed. This is a relatively large number of juveniles for this species, and this observation is similar to what we have observed at other sites this year. Juvenile *Sebastes caurinus/carnatus* were common with 21 observed. Similar to last year adult *Embiotoca jacksoni* and *E. lateralis* were relatively abundant with 27 and 31 observed, respectively. Juvenile *Embiotoca jacksoni* and *E. lateralis* were more common than last year with 15 and 9 observed, respectively. Sixteen adult and five juvenile *Damalichthys vacca* were observed. Several adult *Rhacochilus toxotes* (rubberlip surfperch) were observed. Kelp surf perch, *Brachyistius frenatus*, were common in the kelp canopy. Two adult *Paralabrax clathratus* were observed. Two *Ophiodon elongatus* (lingcod) were observed. *Coryphopterus nicholsii* were common in the low-lying areas of the transect, but their density along the transect of 0.083/$m^2$ doesn't reflect this well. One *Alloclinus holderi* was observed on quadrats for a density of 0.042/$m^2$. The identification of this A. holderi was confirmed by Jonathan Shaffer. Roving diver fish

counts were conducted on August 6th with five divers and on September 23rd with four divers observing 28 and 27 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 last year, two octopuses were observed, one in each of two ARMs. Similar to previous years at this site many of the bricks in the ARMs were covered with encrusting colonial tunicates (mostly *Cystodytes lobatus* and *Tridemnum sp*.).

Two small (31mm and 47mm) *Haliotis rufescens* were found among the nine ARMs this year, 0.22/ARM. *Cypraea spadicea* density continued to gradually increase and was 4.67/ARM, relatively high for this site. Three small *Crassedoma giganteum* were found in the ARMs for a density of 0.33/ARM, similar to recent years. *Asterina miniata* continued to gradually increase in density for the fourth consecutive year to 2.0/ARM, the highest density since 1996. Their mean size has gradually increased over the last four years and was 39.3mm. *Pisaster giganteus* density decreased to 2.78/ARM, the lowest density recorded since 1999. Mean size was similar to last year at 50mm. *Pycnopodia helianthoides* density continued to decline for the second consecutive year and was 0.67/ARM. This decline is similar to what we have observed in densities along the transect.

*Strongylocentrotus franciscanus* density was similar to last year at 12.33/ARM, and their mean size continued to increase for the second consecutive year to 62.4mm. The last notable *S. franciscanus* recruitment was in 2001 and an increase in size would be expected. *Strongylocentrotus purpuratus* abundance continued to decline for the third consecutive year and was recorded at 0.67/ARM, the lowest since 1992. Their mean size was similar to last year at 25.7mm, but sample size was small. No small (<10cm) *Parastichopus parvimensis* were observed in the ARMs and density of >10cm was 0.22/ARM.

Unfortunately the temperature housing including the loggers was stolen at this site, similar to the temperature loggers that were stolen at Johnson's Lee South in 2002. We know that the Loggers were purposefully removed since the four nuts (two on top and two on bottom) that are tightened together were all removed. This could only be done using tools. We presume it was the same person who stole the loggers at the South site in 2002. As a result, there will be no temperature data available for the year these were deployed.

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

**Site #4 SRJLSO**
2003 sampling dates: 8/5, 8/6, 9/23.
2003 status: Mature kelp forest.

A kelp forest is present over the entire site this year. The kelp forest is typical of a mature one with large widely spaced *Macrocystis pyrifera* plants. However, there were some small patches of high density subadult plants as well. Similar to Johnson's Lee North, *M. pyrifera* canopy cover over the transect was estimated at 75% but was a little thicker than at Johnson's Lee North. Adult *M. pyrifera* density increased, while subadult and juvenile density and cover decreased since last year, as one would expect from a maturing kelp forest. Their densities were 0.33/$m^2$, 0.28/$m^2$, and 0.54/$m^2$ respectively and cover was 27.7%. Overall understory algae decreased and this is possibly a result of reduced light conditions on the bottom from the *M. pyrifera* canopy. Similar to previous years no adult *Eisenia arborea* were observed on quadrats and were rare, but juveniles were present in low numbers with a density of 0.083/$m^2$, and cover was 0.83%. Adult and juvenile *Pterygophora californica* densities were 0.083/$m^2$ and 0.17/$m^2$, and cover was 2.7%. Most of the adult *P. californica* were small. Adult and juvenile *Laminaria farlowii* were common with densities of 0.33/$m^2$ and 0.60/$m^2$, respectively, lower than last year and a cover of 1.5%. Miscellaneous brown algae cover was 0.17%, a decline from last year. *Desmarestia* sp. were less abundant and none were observed on RPCs this year. *Cystoseira* spp. were common but had a low cover of 0.17%, and were noticeably less abundant than at Johnson's Lee North. Cover of miscellaneous red algae declined to 28.2%. *Gigartina* spp. (mostly *G. corymbifera*) were more

abundant than last year with a cover of 2.0%. Articulated coralline cover was 4.0%. Encrusting coralline cover continued to decrease to 14.7%, the lowest since 1999. Bare substrate cover also declined and was 7.0%. These declines are probably the result of increases in encrusting invertebrates (tunicates and bryozoans).

Miscellaneous invertebrates on RPCs covered 10.0% of the bottom, similar to the last two years. The most common invertebrates in this category were the sea cucumber *Cucamaria* spp. These were abundant along some areas of the transect, especially in some of the *M. pyrifera* holdfasts. Miscellaneous bryozoan coverage continued to increase for the second year and was recorded at 24.8%. *Diaperoecia californica* were noticeably more abundant along the transect similar to what we have observed at other sites this year, but they were present mostly in steep parts of high relief rocks and were uncommon directly along the transect with none observed on RPCs this year. Tunicates were noticeably more abundant and increased in cover to 10.7%, the highest cover recorded at this site, but the same as in 1999. The tunicates *Cystodytes lobatus* and *Pycnoclavella stanleyi* were moderately abundant. *Styela montereyensis* density increased and they were common with a density of 1.42/$m^2$, with many small ones present. Sponges covered 0.67% of the bottom, also relatively low for this site. *Tethya aurantia* were abundant with a density of 0.28/$m^2$, the highest density recorded at this site since we began monitoring this species in 1983. *Balanophyllia elegans* cover was 6.3%, similar to last year and relatively high for the past several years. *Astrangia lajollaensis* cover was similar to past years at 1.2%. *Corynactis californica* cover continued to increase and was recorded at 6.3%. *Diopatra ornata* cover was 14.3%, similar to previous years. *Lophogorgia chilensis* remained moderately abundant with a density of 0.079/$m^2$, similar to previous years. *Urticina lofotensis* were moderately abundant on the rocky outcrops with a density of 0.103/$m^2$.

*Strongylocentrotus franciscanus* densities increased to 5.54/$m^2$, and were in aggregations confined to crevices. The standard deviation of the quadrats was 10.38/$m^2$, much higher than normal for this site. *Strongylocentrotus purpuratus* density remained low at 0.96/$m^2$, similar to last year. Juvenile *Strongylocentrotus* spp. were relatively uncommon. No sea urchin wasting disease was observed.

*Pycnopodia helianthoides* density continued to decline for the second year but was still moderately abundant at 0.082/$m^2$. Similar to most of the other sites this year, *Asterina miniata* density increased and was 2.33/$m^2$, the highest since 1997. *Pisaster giganteus* were counted in both quadrats and 5-meter quadrats and had densities of 0.25/$m^2$ and 0.13/$m^2$, respectively. *Parastichopus parvimensis* density remained low at 0.042/$m^2$. No sea star wasting disease was observed.

*Haliotis rufescens* continued to be rare at this site, with only one observed on band transects, with a density of 0.0014/$m^2$, similar to last year and again the lowest density recorded on band transects for this site. We did find more *H. rufescens* than usual in the ARMs indicating increased recruitment; see below. *Cypraea spadicea* density was 0.75/$m^2$, relatively high for this site. *Kelletia kelletii* density was 0.032/$m^2$, higher than the last several years. *Crassedoma giganteum* density was 0.0097/$m^2$. *Aplysia californica* were large, but were rare with none observed on band transects this year, and only a few seen along the transect.

Adult *Chromis punctipinnis* were common with 56 observed. No juveniles were observed. Adult *Oxyjulis californica* were common with 86 observed. Two male and up to 22 female S*emicossyphus pulcher* were observed and most were small. Nine adult *Sebastes serranoides* were observed and 13 juvenile *Sebastes serranoides/flavidus* were observed. Twenty three 23 adult and 20 juvenile *Sebastes mystinus* were observed, most of the adults were small. One adult and no juvenile *Sebastes serriceps* were observed. Adult and juvenile *Sebastes atrovirens* were moderately abundant with 18 and 22 observed respectively. Several adult black and yellow rockfish, *Sebastes chrysomelas*, were observed. Juvenile *Sebastes carnatus/caurinus* were common. Similar to Johnson's Lee North, adult and juvenile *Embiotoca jacksoni* and *Embiotoca lateralis* were abundant. Thirty adult and seven juvenile *E. jacksoni*, and 28 adult and nine juvenile *E. lateralis* were observed. Sixteen adult and three *Damalichthys vacca* were observed. Five adult *Paralabrax clathratus* were observed. *Oxylebius pictus* were common with 32 observed. One juvenile *Scorpaenichthys marmoratus* (cabezon) was observed. Two *Ophiodon elongatus* (lingcod) were

observed. *Coryphopterus nicholsii* remained relatively abundant with a density of 0.88/$m^2$, similar to last year. Roving diver fish counts were conducted on August 5$^{th}$ with four divers and on September 23$^{rd}$ with four divers observing 24 and 23 species of fish, respectively.

All seven ARMs were monitored for all indicator species. Three ARMs cages were replaced. Eight *Haliotis rufescens* were found in the ARMs this year, 1.14/ARM. This is the highest density observed at this site since we began monitoring ARMs here in 1993. All of the *H. rufescens* found this year were between 31 – 81 mm with a mean size of 50mm. In 2002 the three *H. rufescens* that were present in the ARMs were all under 21mm indicating recruitment that probably occurred in the previous 12 months. This year's sizes indicates little recruitment in 2003, but noticeable survivorship during the past year as most of the abalone were between 31 – 54mm, which is what we would expect for two year old abalone.

*Cypraea spadicea* density was 0.86/ARM, the lowest recorded since 1994. One small *Megathura crenulata* was observed 0.14/ARM, similar to past years. *Crassedoma giganteus* density was low at 0.14/ARM, and this individual was 112mm indicating no recruitment in the ARMs this year. *Asterina miniata* density increased to 10.0/ARM, the highest recorded since 1996. *Pisaster giganteus* density declined to 1.14/ARM, low compared to the past three years, but similar to the years prior to 2000. *Pycnopodia helianthoides* density was the same as last year at 0.57/ARM. *Parastichopus parvimensis* <10cm density was 0.14/ARM, similar to previous years, and density of large (>10cm) individuals declined to 0.14/ARM. *Strongylocentrotus franciscanus* density was similar to last year at 41.1/ARM and size continued to increase to 52.6mm indicating little recent recruitment. *Strongylocentrotus purpuratus* density increased to 11.9/ARM, similar to several years prior to last year. Mean size was similar to last year at 23.59mm.

One *Phyllolithodes papillosus* (lithoid crab) was found in ARM #2452 this year. We have observed this species in the ARMs at this site in 1997, 2002 and 2003, and this may be a range extension for this species.

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

## Location: Rodes Reef, Santa Rosa Island

**Site #5 SRRR**
2003 sampling dates: 8/21, 9/24.
2003 status: Developing kelp forest.

This site has changed considerably and is now a developing kelp forest. Macroalgae were noticeably more abundant than they have been over the last several years. *Macrocystis pyrifera* canopy cover over the transect was estimated at 20%. Just south of the transect and around the part of Rodes Reef where the wave breaks, canopy cover was thick and covered more area than we have observed since the early 1990's. Adult, subadult, and juvenile *M. pyrifera* densities all increased and were recorded at 0.005/$m^2$, 0.32/$m^2$ and 1.67/$m^2$ respectively, and cover was recorded at 9.17%. These were all the highest values recorded since between 1989-1991. No *Eisenia arborea, Pterygophora californica* or *Cystoseira* spp. were observed along the transect. *Laminaria farlowii* were rare with only several juvenile plants observed, 0.17/$m^2$. *Desmarestia* sp. were abundant along the flat parts of the eastern half of the transect and almost completely covered the bottom in this large area. Cover was recorded at 44.7%, the highest since 1988. Miscellaneous red algae cover was 24.5%, similar to last year. I didn't write many notes concerning which red algae were dominant, but *Laurencia pacifica* were common on the rocky western half of the transect. No miscellaneous plants (brown filamentous diatoms) were observed on RPCs this year, a decrease from last year and indicative of a trend similar to what we have observed at many of the other sites this year. *Gelidium* sp. cover was 1.3%, and we did not note what species it was. *Gigartina* spp. cover was 3.2%, the first time it has been recorded on RPCs since 1996, and the highest cover recorded for this site. Most of this category were small *G. corymbifera*. Articulated coralline algae cover

was 2.3%, higher than recent years. Encrusting coralline algae covered 67.7% of the bottom, similar to recent years. Bare substrate cover was low at 3.8%.

Miscellaneous invertebrates cover, excluding *Ophiothrix spiculata* (*O. spiculata* was permanently separated out this year), was relatively low and decreased to 2.3%. The most common invertebrate in this category was the sea cucumber *Cucumaria piperata*. Now that *O. spiculata* is separated out from the miscellaneous invertebrate category, this species will be discussed in the Echinoderm section below. Similar to the past several years, the parchment tubeworm*, Chaetopterus variopedatus*, was relatively uncommon for this site. *Diopatra ornata* cover remained low at 0.5%. *Astrangia lajollaensis* cover remained high at 9.83%, similar to the last several years. *Balanophyllia elegans* cover was 1.8%, lower than last year, but similar to previous years. Miscellaneous bryozoan cover increased to 8.0%, similar to what has been at other sites this year. *Diaperoecia californica* were noticeably more abundant on the steep sites of rocky relief, but cover directly along the transect was similar to the last several years at 0.33%. *Urticina lofotensis* density was 0.051/$m^2$, similar to previous years. *Urticina coriacea* and *U. colombiana* were also common, as usual for this site. *Lophogorgia chilensis* were rare along the transect, with a density of 0.0028/$m^2$, similar to past years. *Styela montereyensis* remained rare, and none were observed in quadrats for the fourth consecutive year. Several *small S. montereyensis* were observed along the transect. *Tethya aurantia* were moderately abundant at 0.11/$m^2$, similar to previous years. The bright orange encrusting tunicate that has been present at this site for the past several years was noticeably less abundant this year. Tunicate cover was 2.7%, similar to previous years.

*Strongylocentrotus franciscanus* density continued to decrease for the third consecutive year and was 2.54/$m^2$, the lowest density recorded since 1991. *Strongylocentrotus purpuratus* were rare with none observed on quadrats (0.0/$m^2$), the lowest density recorded at this site since monitoring began here in 1983. No emergent *S. purpuratus* were observed along the entire transect and only a few juveniles were observed under rocks. 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 along the transect this year and their cover was recorded at 0.0%, a decrease from the past two years. In 2002 their cover was 5.7%. We observed *Pycnopodia helianthoides* chasing the *O. spiculata* at this site in 2002 and may have contributed to the decline. Similar to last year, sea stars were abundant at this site, but all species declined from last year's unusually high densities. *Asterina miniata* density was 2.42/$m^2$. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats, with densities of 0.71/$m^2$ and 0.60/$m^2$ respectively. *Pycnopodia helianthoides* density declined considerably to 0.083/$m^2$. Similar to last year, *P. helianthoides* of all sizes were present. Several *Orthasterias koehleri* (rainbow stars) and *Dermasterias imbricata* (leather star) were observed along the transect. *Henricia* sp*.* (blood stars) were common. Short spined sea stars, *Pisaster brevispinus*, were common. Large *Parastichopus parvimensis* were present on the western/rocky half of the transect, but none were observed in quadrats this year (0.0/$m^2$). These continued to be the largest *P. parvimensis* we have observed anywhere on the Islands.

No live *Haliotis* spp. were observed along the transect this year, but one small fresh shell measuring 25mm was found indicating some recent recruitment. *Kelletia kelletii* were more common than usual with a density of 0.022/$m^2$. No *Lithopoma gibberosum* or *L. undosum* were observed on quadrats this year. Along the transect only several *L. gibberosum* were observed and no one observed any *L. undosum*. *Megathura crenulata* were common on the western/rocky end of the transect with a density of 0.038/$m^2$, similar to the last two years. *Aplysia californica* were rare, and none were observed on band transects this year. *Cypraea spadicea* density was 0.042/$m^2$, relatively low for this site. Rock crabs, *Cancer* spp. (all *Cancer productus* or *C. antenarius*), were counted on band transects, but not entered in the data base since they are not one of the indicator species. A total of five were observed (one in each of three band transects, and two in one other) for a density of 0.0069/$m^2$.

Fish were moderately abundant and diverse. Similar to previous years, fish were concentrated at the western/rocky end of the transect. The most noticeable change since last year was an increase in juvenile *Sebastes* spp. which were diverse and moderately abundant on the bottom using the understory

algae and rocks for shelter. A school of about 100 adult *Chromis punctipinnis* briefly swam by the transect, otherwise they were relatively uncommon. Three juveniles and up to 13 adult *Embiotoca jacksoni* were observed. One juvenile and up to 11 adult *E. lateralis* were observed. Three rubberlip, *Rhacochilus toxotes* were observed. Thirteen juvenile and 13 adult *Rhacochilus vacca* were observed. Kelp surfperch, *Brachyistius frenatus*, were common with up to 16 observed. Rainbow surfperch, *Hypsurus caryi,* were common. Two large adult *Paralabrax clathratus* were observed, similar to pervious years. Up to 17 adult and 30 juvenile *Sebastes mystinus* were observed. Two black rockfish, *Sebastes melanops*, were observed. Six adult and 23 juvenile *Sebastes atrovirens* were observed. Five adult *Sebastes serranoides* and 50 juvenile *Sebastes serranoides/flavidus* were observed. No adult and five juvenile *Sebastes serriceps* were observed. One juvenile vermillion rockfish, *Sebastes miniatus* was observed. Juvenile gopher/copper rockfish, *Sebastes carnatus/caurinus* were moderately abundant in the rocks and sub canopy kelp with up to 30 KGB *Sebastes* juveniles observed. One black and yellow rockfish, *Sebastes chrysomelas*, and one copper rockfish, *Sebastes caurinus* were observed. Juvenile Bocaccio, *Sebastes paucispinis* were common hiding in or just above the *Desmarestia sp*., with up to 33 observed. Two male and six female *Semicossyphus pulcher* were observed, all were of moderate size. Adult *Oxyjulis californica* were common with up to 97 observed. Several ronquils were observed. These were the same species as has been observed at this site in the past and were recorded as stripefin ronquils, *Rathbunella hypoplecta*. Up to 49 Painted greenlings, *Oxylebius pictus*, were observed. *Coryphopterus nicholsii* density was 0.17/$m^2$, relatively high for this site. Roving diver fish counts were conducted on August 21$^{st}$ with three divers and on September 24$^{th}$ with four divers observing 22 and 32 species of fish respectively.

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

## Location: Gull Island, Santa Cruz Island

**Site #6 SCGI**
2003 sampling dates: 7/24, 8/4, 9/8.
2003 status: Mature kelp forest.

This site continued to change and mature as an established kelp forest. Sea urchin density continued to decline and both *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* were at their lowest densities since monitoring began in 1982.

*Macrocystis pyrifera* canopy cover was thick and covered approximately 90% of the transect on July 24$^{th}$. The kelp forest at this site last year was described as developing with high densities of small *M. pyrifera* plants. This year, the site is considered a mature kelp forest with greatly reduced densities, but larger *M. pyrifera*. In addition, with low light levels at the bottom due to a thick canopy, the understory algal community has changed. Adult *M. pyrifera* densities increased while subadult and juvenile densities, and percent cover decreased. Their densities were 0.28/$m^2$, 0.19/$m^2$, and 0.58/$m^2$ respectively and cover was 23.7%. This was the first time adult *M. pyrifera* were present on 5-meter quadrats since this protocol was implemented in 1996, in 2002, all of the plants were subadults by this protocols definition. Adult and *juvenile Eisenia arborea* densities and percent cover were lower than last year at 0.17/$m^2$, 0.5/$m^2$, and 0.5%, respectively. Most of the adult plants along the transect were senescing and we presume this is a result of the low light conditions produced by the thick *M. pyrifera* canopy. Several small adult and juvenile *Pterygophora californica* were observed with densities of 0.13/$m^2$ and 0.042/$m^2$ respectively, and a cover of 0.5%. This was the first time adult *P. californica* were observed along the transect since we separated adults and juveniles out in 1996. *Laminaria farlowii* was rare with none observed on quadrats and only several juvenile plants observed along the transect, with a cover of 0.17%. No *Desmarestia sp*. were observed along the transect this year. Similar to last year, a small amount of *Cystoseira sp*. were observed and had a cover of 1.0%. Miscellaneous red algae were much less abundant than last year and was recorded at is lowest cover since 1982, at 1.5%. Miscellaneous plants consisting of filamentous brown diatoms were rare and none were observed on RPCs for the first time since 1994. Articulated coralline algae remained low at 1.0%. Encrusting coralline algae cover decreased to 33.7%, the lowest

cover since 1989. This was a result of the increase in encrusting invertebrates. Bare substrate cover remained low and was 5.7%

The most common miscellaneous invertebrates on RPCs were amphipod tube mates, hydroids, and Christmas tree worms, *Spirobranchus spinosus*. Miscellaneous invertebrates excluding *Ophiothrix spiculata* covered 27.8% of the bottom, the highest cover recorded for this category. There were no *O. spiculata* along the transect this year, and this was a relatively high cover for this site. *Corynactis californica* cover was the same as last year, 4.7%. *Balanophyllia elegans* and *Astrangia lajollaensis* cover decreased to the lowest recorded at this site, 1.8% and 0.67% respectively. The large increase in encrusting invertebrates at this site could possibly explain the decrease in cup corals. The large increase in encrusting invertebrates at this site could possibly explain the decrease in cup corals. 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. *Diopatra ornata* remained relatively uncommon for this transect and none were observed on RPCs for the third consecutive year. Bryozoans continued to increase and were noticeably abundant, similar to what we have observed at other sites this year. Miscellaneous bryozoan cover was 26.2%, the highest recorded since this category was added to RPCs in 1985. *Diaperoecia californica* were also noticeably more abundant with a cover of 4.8%, the highest since 1993. The most common bryozoans were *Membranipora sp*., *D. californica*, *Phidolopora pacifica*, and *Costazia robertsoniae*. *Lophogorgia chilensis* density was 0.014/$m^2$, the lowest recorded at this site since monitoring for this species began in 1983. We are unsure of why *L. chilensis* densities were so low. *Tethya aurantia* density declined to 0.0097/$m^2$, the lowest recorded since 1990. *Stylaster californica* density remained relatively high at 0.076/$m^2$, similar to the last several years. Both large and small colonies of *S. californica* were common.

*Strongylocentrotus franciscanus* and *S. purpuratus* were rare and their densities continued to decline with 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. No *Lytechinus anamesus* were observed on band transects, similar to last year. No *Centrostephanus coronatus* were observed on quadrats or along the transect. No sea urchin wasting disease was observed. Two divers (David Kushner and Aimee Bullard) measuring *S. franciscanus* and *S. purpuratus* were only able to locate 35 and 18 respectively during one dive, indicating few sea urchins along the entire transect.

*Asterina miniata* density continued to increase for the fifth consecutive year and remained relatively high at 2.5/$m^2$, the highest density recorded at this site since monitoring began in 1982. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats and had densities of 0.25/$m^2$, and 0.16/$m^2$ respectively. *Pycnopodia helianthoides* remained relatively abundant with a density of 0.029/$m^2$, lower than last year. *Pachythyone rubra* were rare with a cover of 0.17%, similar to recent years. No sea star wasting disease was observed.

*Cypraea spadicea* are typically relatively abundant, but none were observed on quadrats this year (0.0/$m^2$) the lowest density recorded since we began counting these in 1983. Similar to other sites, *Lithopoma undosum* continued to decrease for the fourth consecutive year and none were observed on quadrats (0.0/$m^2$), the lowest density recorded since 1994. Only several were found for size frequency measurements and these were relatively large. *Megathura crenulata* also continued to decline for the fourth consecutive year and were rare at a density of 0.0/$m^2$, the lowest recorded since we began monitoring them in 1983. *Kelletia kelletii* density was 0.011/$m^2$, relatively low for this site. Similar to last year, *Aplysia californica* were rare and none were observed on band transects, 0.0/$m^2$, the lowest density since 1993. *Crassedoma giganteum* density continued to decline for the fourth consecutive year and none were observed on band transects (0.0/$m^2$) for the first time since 1983. *Tegula regina* were common and the most abundant large snail, similar to last year.

Diversity of fish was relatively high, but abundance of any one species was not out of the ordinary. Adult *Chromis punctipinnis* were common on the Southern end of the transect and no juveniles were observed this year. *Oxylebius pictus* (painted greenling) were one of the most abundant fish at the site with most observers on the fish count observing about 35. At least eight small adult and 17 juvenile Sebastes

mystinus were observed. At least four adult and five juvenile *Sebastes atrovirens* were observed. Several small adult *Sebastes serranoides* were observed and juvenile *Sebastes* serranoides/flavidus were common with at least 15 observed. Several juvenile/YOY *Sebastes caurinus/carnatus*, copper/gopher, were also observed. Five adult *Sebastes serriceps* were observed on July 24th, but no adults were observed on August 4th. Juvenile *S. serriceps* were abundant with up to nine observed, this is similar to what we have observed at other sites this year. Three juvenile *Sebastes paucispinis* (Bocaccio) were observed. Three *Hypsypops rubicundus* were observed. Kelp surfperch, *Brachyistius frenatus*, were common in the *M. pyrifera* canopy. Several *Girella nigricans* were observed. *Paralabrax clathratus* were uncommon with only one observed. Several adult *Embiotoca lateralis* were observed, but no juveniles. Adult *E. Embiotoca* were common with up to eight observed, but only one juvenile. No *Halichoeres semicinctus* were observed. Up to seven adult *Oxyjulis californica* were observed. Small female *Semicossyphus pulcher* were moderately abundant with up to 15 observed. Two males and one juvenile were observed. At least four lingcod, *Ophiodon elongatus*, were observed. *Coryphopterus nicholsii* were common with a density of 0.83/$m^2$, similar to last year. No *Lythrypnus dalli* were observed. No *Alloclinus holderi* were observed on quadrats for the second year. Roving diver fish counts were conducted on July 24th with four divers observing 27 species of fish and on August 4th with five divers observing 24 species of fish.

All 14 ARMs were in good condition and monitored for all indicator species. Three *Haliotis assimilis* were found in the ARMs this year for a density of 0.21/ARM. These *H. assimilis* measured 38, 48, and 70mm, indicating probably at least two years of recruitment.

*Cypraea spadicea* mean density continued to increase for the third consecutive year to 13.71/ARM, the highest recorded since 1994. *Kelletia kelletii* density was 0.14/ARM, these are typically rare in the ARMs, but this is the fourth consecutive year we have found them at this site. No *Lithopoma undosum* or *L. gibberosum* were found in the ARMs this year. *Megathura crenulata* density was similar to last year at 0.21/ARM, and all were small with a mean size of 16.3mm. *Crassedoma giganteum* density was 0.43/ARM, lower than the last several years. *Asterina miniata* mean density and size were 3.93/ARM and 26.2mm respectively, similar to last year. *Pisaster giganteus* density declined to 0.36/ARM. *Pisaster giganteus* mean size continued to increase slightly to 81.6mm. *Pycnopodia helianthoides* mean density was 0.21/ARM similar to recent years. Similar to last year there were no *Parastichopus parvimensis* <10cm, and the mean density of >10cm was low at 0.08/ARM. *Strongylocentrotus franciscanus* density decreased dramatically to 22.43/ARM. In 2002, *S. franciscanus* was recorded at their highest density. Their mean size continued to increase and was 25.6mm. We think this large decline is a result of predation by *Pycnopodia helianthoides*. *Strongylocentrotus purpuratus* mean density remained relatively low for this site and changed little from last year at 9.93/ARM. Mean size declined to 12.4mm indicating more recruitment. No *Centrostephanus coronatus* were observed in the ARMs for the second consecutive year.

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

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

**Site #7 SCFH**
2003 sampling dates: 7/21, 7/22, 10/8.
2003 status: Open area with high densities of *Pachythyone rubra* and *Ophiothrix spiculata*.

Overall, this site has not changed much in appearance, but there are some interesting trends with several species at their 20+ year abundance high or low. The most noticeable change is that *Strongylocentrotus purpuratus* densities continued to decline and no longer contribute to the echinoderms that dominate the site.

This site continued to be dominated by echinoderms and is nearly devoid of macroalgae. However, there were more macroalgae than last year. Juvenile *Eisenia arborea* were common along the transect and

several were observed in quadrats with a density of 0.21/$m^2$. The site was devoid of *Macrocystis pyrifera*, *Pterygophora californica* and *Laminaria farlowii*, similar to past years. There was a small amount of green algae (*Codium fragile*) and cover was recorded at 1.2%. Miscellaneous red algae were more abundant than in recent years and had a cover of 11.3%, the highest coverage recorded since 1994. Most of these were foliose red algae and not filamentous. Miscellaneous plants consisting of filamentous brown diatoms covered 3.2% of the bottom. Articulated coralline algae were rare with a cover of 0.17%, and encrusting coralline algae cover was 38.8%, similar to previous years. Bare substrate cover was 12.2%, relatively low for the past decade.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, decreased with a cover of 7.83%, the lowest recorded since 1982 (even if combined with *O. spiculata*). The most common miscellaneous invertebrates on RPCs were *Hydractinia milleri*, *Lophogorgia chilensis*, and the sea cucumber *Cucumaria piperata*. *Ophiothrix spiculata* cover decreased and is described below in the echinoderm section. *Astrangia lajollaensis* cover was 10.0%, relatively low for this site, but the decrease could be sampling variability. *Corynactis californica* and *Balanophyllia elegans* covered 0.67% and 0.5% of the bottom respectively. Similar to other sites this year, miscellaneous bryozoans has increased dramatically and cover was recorded at 15.8%, the highest since 1985. *Diaperoecia californica* were also more abundant with a cover of 7.8%, the highest recorded since 1997. *Lophogorgia chilensis* were relatively abundant, but have declined gradually for the third consecutive year to 0.23/$m^2$. We have observed a decrease of this species at several other of the sites. *Lophogorgia chilensis* were more abundant on the offshore/deep side of the transect. *Eugorgia rubens* were common on this side of the transect. *Tethya aurantia* were relatively rare and their density declined for the fifth consecutive year to 0.0/$m^2$, the lowest density recorded since monitoring began for this species in 1983.

*Strongylocentrotus purpuratus* density dramatically declined to 4.33/$m^2$, the lowest density since 1994. *Strongylocentrotus franciscanus* density also declined dramatically to 0.33/$m^2$, the lowest at this site since monitoring began in 1982. *Centrostephanus coronatus* density remained low at 0.083/$m^2$. *Lytechinus anamesus* densities continued to decline for the third consecutive year and were counted only on band transects this year, but none were observed directly along the transect. Their density this year was 0.019/$m^2$, the lowest density since 1987. Similar to other sites this year, juvenile *Strongylocentrotus spp.* were rare. No sea urchin wasting disease was observed. The decline in sea urchins at this site may have been a result of disease, or predation by *Pycnopodia helianthoides*, or a combination of both.

*Ophiothrix spiculata* cover decreased to 7.8%, in 2002 cover was recorded at 22%. *Pachythyone rubra* were abundant, but had a much lower cover than in 2002. Their cover this year was 10.8%, the lowest since 1999. I did not get the impression that overall cover decreased that much and this decrease may have been a result of patchiness or possibly disturbance by divers. If a diver is not being careful during or before RPCs are conducted the cucumbers tend to contract their feeding apparatus and cover substantially less area. *Parastichopus parvimensis* density was 0.71/$m^2$, higher than the last several years. *Pisaster giganteus* density was lower than last year, but remained relatively abundant for this site. They were counted on both quadrats and 5-meter quadrats with densities of 0.71/$m^2$ and 0.55/$m^2$ respectively. *Asterina miniata* density was 1.83/$m^2$, an increase from last year and the highest density recorded at this site since monitoring began in 1982. *Pycnopodia helianthoides* were noticeably abundant at this site with a density of 0.021/$m^2$, the highest recorded density. Later on in the summer we conducted band transects for a second time since their density continued to increase dramatically and we wanted to document this. Sea star wasting disease was observed in one *A. miniata*.

*Pycnopodia helianthoides* were noticeably more abundant during our visit to the site on October 10$^{th}$. There were large numbers of them on the Northern end of the transect. This was similar to what David Kushner had observed at three other sites on the front side of Santa Cruz just several weeks earlier. It appeared that the *P. helianthoides* were feeding on anything, including *Pachythyone rubra* which are abundant at this site. We decided to resample *P. helianthoides* using band transects, but only counting that species. As of now the data will not be entered in the data base since two years of a single species is not compatible with our database and associated report queries. Below is the raw data for *Pycnopodia* at Fry's Harbor on October 10$^{th}$:

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Count A (inshore) | 12 | 6 | 4 | 6 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 |
| Transect # / Meter # | 1/3 | 2/11 | 3/20 | 4/28 | 5/36 | 6/45 | 7/53 | 8/61 | 9/70 | 10/78 | 11/86 | 12/95 |
| Count B (offshore) | 3 | 42 | 5 | 8 | 2 | 3 | 3 | 2 | 0 | 2 | 1 | 2 |

This represents a mean density of 0.146/$m^2$. This is the highest density recorded at this site. Earlier in the summer when we conducted band transects for all the indicator species, they were relatively abundant with the highest density recorded for the site prior to this visit at 0.021/$m^2$. If the current density persists I think there will be notable changes at the site due to their predatory effects.

*Cypraea spadicea* density was 0.54/$m^2$, similar to the last several years. *Lithopoma undosum* density continued to decline for the fourth consecutive year and they were rare with none observed on quadrats (of 0.0/$m^2$) the lowest since 1992. *Kelletia kelletii* density continued to decline for the second consecutive year and was 0.0014/$m^2$. *Aplysia californica* were rare with a density of 0.0028/$m^2$. *Megathura crenulata* density continued to decline for the second consecutive year and was 0.038/$m^2$, the lowest density recorded since monitoring for this species began at this site in 1983. *Crassedoma giganteum* density also decreased and was 0.0028/$m^2$, the lowest density recorded since monitoring began for this species at this site in 1983. The decrease in C. giganteum and M. crenulata densities are similar to what we have observed at other sites this year.

Fish were abundant and diverse at this site. Diversity was higher than in 2002. The most abundant fish were adult *Chromis punctipinnis* and *Coryphopterus nicholsii*. Up to 306 adult *C. punctipinnis* and one juvenile were observed. Though similar to last year, this is low abundance for juvenile *C. punctipinnis* for this site. Painted greenlings, *Oxylebius pictus* were abundant with up to 43 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 nine adults were observed on a roving diver fish count. Several adult and juvenile *Sebastes mystinus* were observed. On October 8th we observed at least six adult black rockfish, *Sebastes melanops*. Typically, there is one present along the transect, but this was an unusually high number. All were observed on the deeper side of the transect. Adult and juvenile *Sebastes serriceps* were more abundant than usual with up to eight adults and six juveniles observed. Several adult and juvenile *Sebastes atrovirens* were observed. Up to four adult gopher rockfish, *Sebastes carnatus* were observed. Adult *Oxyjulis californica* were common and up to 45 were observed. Several male and female *Halichoeres semicinctus* were observed. Up to seven small female and one small male *Semicossyphus pulcher* were observed. Adult *Hypsypops rubicundus* were common with seven observed, but no juveniles. Several ronquils were observed and were most likely stripefin ronquils, *Rathbunella hypoplecta*. Up to 20 adult *Damalichthys vacca* were observed. Only one adult *Rhacochilus toxotes* (rubberlip surfperch) was observed this year. These are usually more abundant at this site. One swell shark, *Cephaloscyllium ventriosum,* and one Angel shark, *Squatina californica,* were observed. Several adult *Embiotoca jacksoni* were observed. One *Medialuna californiensis* and up to four *Girella nigricans* were observed. *Coryphopterus nicholsii* density continued to increase for the third consecutive year and was 2.92/$m^2$, the highest recorded since 1989. This increase is similar to what we have observed at other monitoring sites this year. Several *Alloclinus holderi* were observed and had a density of 0.17/$m^2$. No *Lythrypnus dalli* were observed for the third consecutive year. This has been the longest period that these have not been observed on quadrats. No *L. zebra* were observed, which are typically common at this site. Roving diver fish counts were conducted on July 21st with five divers and on October 8th with four divers observing 30 and 33 species of fish respectively.

Several of the ARMs were disturbed and moved downhill probably due to surge caused by large waves this past winter. Only five ARMs were intact and all of these were sampled for all indicator species. ARMs # 2432 and 2388 were damaged and not sampled. These two ARMs were also not repaired so that total number of ARMs at this site is now five. ARMs #2435 and 2391 tumbled down below the deeper side of the transect line. These were intact and were sampled. The cages were replaced and moved closer to their original location on the shallow side of the transect. ARM #2434 was below the

transect, but similar to its location in 2002. This ARM was sampled and moved just several meters to a more stable area. ARM# 2433 was below the transect similar to 2002 and was sampled. ARM # 2431 was in its original location and was sampled. This ARM had noticeably more animals in it than the other ARMs that had moved. Overall, the shallower side of the transect has more *Strongylocentrotus purpuratus* than the deeper areas.

No *Haliotis* spp. were found in the ARMs this year. *Cypraea spadicea* density decreased to 3.80/ ARM, relatively low for this site. *Megathura crenulata* density declined with none observed in the ARMs this year 0.0/ARM, the lowest density recorded at this site sine the ARMs were installed. *Crassedoma giganteum* density was 2.0/ARM and a mean size of 63.0mm, similar to last year. *Asterina miniata* density declined to 9.40/ARM and mean size was 36.8mm similar to previous years. *Pisaster giganteus* declined and was not nearly as abundant as the past two years with a density of 3.00/ARM. *Strongylocentrotus spp.* were notably less abundant than in previous years in the ARMs and were recorded at their lowest densities since we began monitoring the ARMs at this site in 1993. *Strongylocentrotus franciscanus* and *S. purpuratus* densities were 13.80/ARM and 1.40/ARM respectively. *Strongylocentrotus franciscanus* mean size increased to 34.4mm, and was the highest recorded at this site. *Strongylocentrotus purpuratus* mean size was 19.3, similar to last year. *Centrostephanus coronatus* abundance continued to decline in the ARMs and none were found this year. *Parastichopus parvimensis* density was similar to recent years with 0.20/ARM <10cm and 0.40 >10cm.

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

## Location: Pelican Bay, Santa Cruz Island

**Site #8 SCPB**
2003 sampling dates: 7/22, 8/20.
2003 status: Dominated by Strongylocentrotus purpuratus.

This site appeared to have changed the least of all of the KFM sites this year. It remains dominated by *Strongylocentrotus purpuratus* and is mostly devoid of macroalgae. *Macrocystis pyrifera*, *Pterygophora californica*, *Laminaria farlowii*, *Cystoseira* spp., *Desmarestia* spp., and *Gigartina* spp. were all absent from the site. Several unhealthy looking juvenile *Eisenia arborea* was observed on tops of large rocks along the transect. The most common foliose algae were the red alga, *Laurencia pacifica*, brown alga, *Colpomenia* sp., and *Gelidium* sp. on the tops of rocks. Miscellaneous red algae cover was 3.7%. Miscellaneous plants, consisting entirely of filamentous brown diatoms were more abundant than in recent years with a cover of 8.0%. Articulated coralline algae were rare with a cover of 0.17%. Encrusting coralline algae cover increased to 52.5%, the highest cover recorded. This increase may be a result of less sand on the bottom. Bare substrate cover correspondingly decreased to 34.0%. Sand cover has gradually decreased for the third consecutive year to 14.8%, while rock and cobble have gradually increased.

Miscellaneous invertebrates on RPCs covered 4.0% of the bottom, similar to last year. The most common miscellaneous invertebrates were *Spirobranchus spinosus*. *Astrangia lajollaensis* covered 6.5% of the bottom, similar to the last several years. *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 this year. *Diaperoecia californica* were 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 transects with a cover of 0.17%. Other bryozoans were relatively rare with a cover of 0.67%. Similar to last year, we continued not to observe the large increase in bryozoans at this site that we have observed at almost every one of the other sites. *Lophogorgia chilensis* density was similar to the last two years at 0.16/$m^2$.

*Strongylocentrotus purpuratus* density declined for the second consecutive year, but remained high at 28.0/$m^2$, and this species dominated the site. *Strongylocentrotus franciscanus* density was 2.1/$m^2$,

similar to last year. 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 this year, similar to other sites. *Lytechinus anamesus* were counted on both quadrats and band transects. Their densities declined from last year and were 2.96/$m^2$ and 1.14/$m^2$ respectively. *Centrostephanus coronatus* density was 0.21/$m^2$, similar to the last several years. No sea urchin wasting disease was observed on July 22nd.

*Asterina miniata* density continued to increase for the fifth consecutive year to 0.83/$m^2$, the highest density recorded at this site since monitoring began in 1982. This increase is similar to what we have observed at other sites this year. *Pisaster giganteus* remained relatively abundant for this site. They were counted on both quadrats and 5-meter quadrats, with densities of 0.042/$m^2$ and 0.20/$m^2$ espectively, similar to last year. *Parastichopus parvimensis* density remained low, but was higher than last year at 0.21/$m^2$. No sea star wasting disease was observed.

*Crassedoma giganteum* density declined for the second consecutive year to 0.0069/$m^2$, the lowest recorded since 1983. This decreased in *C. giganteum* is similar to what we have observed at other sites this year. *Aplysia californica* density was 0.0042/$m^2$. *Lithopoma undosum* density continued to decline for the fourth consecutive year to 0.042/$m^2$, the lowest density recorded since monitoring began in 1982. They were rare along the entire transect, and this decline is similar to what we have observed at other sites this year. *Kelletia kelletii* density continued to decline to 0.0014/$m^2$, the lowest recorded at this site since monitoring began for this species in 1983.

This site continues to have a relatively abundant fish population with moderate diversity. *Coryphopterus nicholsii* continue to be the most abundant fish at this site. Their density continued to increase for the fifth consecutive year and was 8.83/$m^2$, the highest since 1989. Several observers counted *C. nicholsii* during the fish count with counts ranging from 310 – 560. Adult *Embiotoca jacksoni* were abundant with up to 20 observed, and no juveniles were observed. Adult *Damalichthys vacca* were common with up to 10 observed, and no juveniles were observed. Adult rubberlip surfperch, *Rhacochilus toxotes*, were common as usual for this site with 11 observed. Adult *Hypsypops rubicundus* were relatively abundant with 15 observed, and no juveniles were observed. Adult *Chromis punctipinnis* were common and the second most abundant fish at this site, no juveniles were observed this year. Small female *Semicossyphus pulcher* were relatively rare with few observed. No male or juvenile *S. pulcher* were observed this year, similar to last year. Adult *Oxyjulis californica* were rare with only four observed. No juveniles were observed. Male and female *Halichoeres semicinctus* were rare with only one of each sex observed. Similar to previous year's adult *Paralabrax clathratus* were abundant and several were notably large. Up to 24 *P. clathratus* were counted during a fish count. No juveniles were observed. *Adult Sebastes atrovirens* were common with up to eight observed, and three juveniles were observed. No *Sebastes serranoides* were observed. Two adult and five juvenile *Sebastes serriceps* were observed. This relatively large number of juveniles is similar to what we have observed at other sites this year. Small ocean whitefish, *Caulolatilus princeps*, were common as usual for this site. However, after a fish count one observer counted 31 at this site. *Lythrypnus dalli* were rare for this site with only one observed, but none on quadrats (0.0/$m^2$). This is only the third time a density this low has been recorded. These have decreased at many of the sites over the past several years. Only one *L. zebra* was observed this year. *Alloclinus holderi* density continued to be low at 0.0/$m^2$, the same as last year. Only two large individuals were observed during a fish count. Roving diver fish counts were conducted on July 22nd with six divers observing 23 species of fish and on August 20th with six divers observing 21 species of fish.

All six ARMs at this site were intact and sampled for all indicator species. Two ARMs cages were replaced. Similar to previous years, the ARMs were relatively bare. No *Haliotis* spp. have been found in the ARMs since 1999. *Cypraea spadicea* density continued to increase for the second consecutive year and was 6.33/ARM, similar to previous years. No *Lithopoma undosum* were observed in the ARMs for the second consecutive year. *Crassedoma giganteum* density was low at 0.83/ARM. *Asterina miniata* density and size were 5.17/ARM and 45.29mm, similar to last year. *Pisaster giganteus* density was similar to last year at 1.67/ARM. No *Lytechinus anamesus* were observed similar to the previous two years. *Strongylocentrotus franciscanus* density continued to decline for the fourth consecutive year.

Their density was 9.5/ARM, the lowest recorded at this site since we began monitoring the ARMs in 1994. *Strongylocentrotus franciscanus* mean size (36.61mm) continued to increase for the fifth consecutive year indicating lower recruitment. The trends for *S. purpuratus* are similar to *S. franciscanus*. *Strongylocentrotus purpuratus* density decreased for the second consecutive year and was 15.83/ARM; the lowest since monitoring began in the ARMs in 1994. Their size increased to 29.76mm indicating lower recruitment. No *Centrostephanus coronatus* have been observed in the ARMs since 2000. *Parastichopus parvimensis* density >10cm and <10cm were 0.0/ARM and 0.50/ARM respectively. This is the lowest density of animals >10cm since we began monitoring this species in the ARMs in 1996, and the second lowest for ones <10cm.

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

## Location: Scorpion Anchorage, Santa Cruz Island

**Site #9 SCSA**
2003 sampling dates: 8/20, 9/26, 10/9.
2003 status: Dominated by *Strongylocentrotus purpuratus*.

Unlike most of the other kelp forest monitoring sites that are dominated by echinoderms, this site has changed little from last year and continues to be 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 along the transect. Miscellaneous red algae cover remained relatively high for this site and was 9.2%. Similar to last year the most common red alga was *Laurencia pacifica*. Miscellaneous plants consisting of filamentous brown diatoms were common with a cover of 4.7%, similar to the last two years. Articulated and encrusting coralline algae cover were recorded at 0.67% and 65.7% respectively. Bare substrate cover was 19.2%.

Similar to past years the most common miscellaneous invertebrate on RPCs was the Christmas tree worm, *Spirobranchus spinosus*. Miscellaneous invertebrates, excluding *Ophiothrix spiculata,* covered 15.0% of the bottom, similar to last year. *Serpulorbis squamigerus* continued to be relatively uncommon directly along the transect and none were observed again on RPCs for the second consecutive year. Bryozoans were uncommon directly along the transect and none were observed on RPCs. *Diaperoecia californica* were present on the steep sides of the largest boulders around the transect, although none were observed on RPCs. Three small *Lophogorgia chilensis* were observed during band transects for a density of 0.0042/$m^2$, similar to recent years at this site. *Tethya aurantia* density was 0.025/$m^2$, similar to last year.

This site continues to be dominated by *Strongylocentrotus purpuratus* and has the highest density of all of the monitoring sites at 73.1/$m^2$. Similar to previous years, most of the *S. purpuratus* were small with a mean size of 26mm. *Strongylocentrotus franciscanus* density was 3.13/$m^2$, similar to the past several years. *Centrostephanus coronatus* were present at the site, but none were observed in quadrats, similar to last year. *Lytechinus anamesus* were less abundant than the past several years with a density of 0.0042/$m^2$, and were noticeably large. Two *S. purpuratus* were observed with sea urchin wasting disease on August 20$^{th}$.

*Asterina miniata* density remained relatively high for this site at 0.5/$m^2$. Most of the *A. miniata* were noticeably large. *Pisaster giganteus* densities ended their increase and appear to have stabilized or declined. *Pisaster giganteus* were recorded on both quadrats and 5-meter quadrats and had densities of 0.21/$m^2$ and 0.06/$m^2$ respectively. On August 20$^{th}$ we estimated 25% of the *A. miniata* had sea star wasting disease and some were nearly completely wasted. The temperature loggers indicated that several weeks prior temperatures were sustained at around 20° C for about two weeks. We presume this may have triggered the wasting disease. One *Pycnopodia helianthoides* was observed with advanced stages of sea star wasting disease. *Parastichopus parvimensis* density was 0.21/$m^2$.

*Aplysia californica* were relatively abundant with a density of 0.079/$m^2$, similar to last year. Small aggregations with eggs were common. Again, it is surprising that this site which has so little algae can support a population of these grazers. Similar to last year, *Strongylocentrotus purpuratus* were observed feeding on the *A. californica* eggs. *Lithopoma undosum* continued to rapidly decline for the third consecutive year and their density was recorded at 0.25/$m^2$, the lowest recorded for this site. This rapid decline is surprising and their density was the highest at 12.3/$m^2$ in 2000. *Megathura crenulata* density was 0.040/$m^2$, similar to last year. *Cypraea spadicea* density was 0.29/$m^2$, similar to last year. *Crassedoma giganteum* density was 0.028/$m^2$, 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/$m^2$.

Similar to last year, Adult *Chromis punctipinnis* and *Coryphopterus nicholsii* were the most abundant fish at the site. About 150 *adult C. punctipinnis* were present along the transect and no juveniles were observed this year. Up to 37 adult *Oxyjulis californica*, eight adult *Paralabrax clathratus*, 30 adult *Embiotoca jacksoni*, eight *Rhacochilus vacca*, 14 adult *Hypsypops rubicundus* and 31 *Oxylebius pictus* were observed on the fish counts. *Semicossyphus pulcher* were relatively rare with only three small females observed. Up to five female and three male *Halichoeres semicinctus* were observed. Only one juvenile *Sebastes mystinus* was observed this year. One small black rockfish, *Sebastes melanops* was observed. Juvenile *Sebastes serriceps* were relatively abundant with up to five observed, similar to other sites this year. One adult *S. serriceps* was observed. Two black and yellow rockfish, *Sebastes chrysomelas*, and two adult *Sebastes atrovirens*, and one small adult *Sebastes serranoides* were observed. Up to four juvenile KGB Sebastes spp. were observed. One juvenile brown rockfish, *Sebastes auriculatus* was observed. Similar to last year, no zebra gobies, *Lythrypnus zebra,* were observed. In the past these were often common at this site. No *Lythrypnus dalli* were observed this year. *Coryphopterus nicholsii* were abundant and their density increased to 2.92/$m^2$, the highest recorded at this site since monitoring for this species began in 1985. *Alloclinus holderi* were rare with a density of 0.083/$m^2$. Roving diver fish counts were conducted on August 20$^{th}$ with five divers and on September 26$^{th}$ with five divers observing 24 and 23 species of fish respectively.

Six of the seven ARMs were monitored for all indicator species. The remaining ARM #2427 was on its side and the cage was broken from what looked like possible anchor damage. This ARM was rebuilt but not sampled.

Similar to past years, the ARMs were relatively bare with few indicator species in them. No *Haliotis* spp. were observed in the ARMs this year, similar to past years. *Cypraea spadicea* density was similar to past years at 14.0/ARM, this is relatively high compared to other sites. No *Lithopoma undosum* were present in the ARMs this year (0.0/ARM), the lowest density since we began monitoring the ARMs at this site in 1993. Similarly, *L. undosum* density in quadrats was recorded at the lowest density since monitoring began in 1982. *Crassedoma giganteum* density was 2.33/ARM. Their mean size continued to increase for the fifth consecutive year and was the highest recorded for this site at 106.6mm. Only three *C. giganteum* were under 35mm indicating little recruitment. However, the gradual increase in mean size over the last several years indicates successful recruitment in past years.

*Asterina miniata* density was 1.33/ARM and mean size was 50.4mm, both increases from last year. *Pisaster giganteus* density continued to decline for the second year and was 0.83/ARM, while mean size increased for the third consecutive year to 100.40mm, the largest recorded at this site in the ARMs indicating little recruitment. *Strongylocentrotus franciscanus* density was slightly lower than last year at 8.67/ARM and their mean size was 41.4mm, slightly higher than last year. *Strongylocentrotus purpuratus* density declined to 20.33/ARM, the lowest density since 1998. Their mean size continued to increase for the fourth consecutive year to 27.9mm. No *Centrostephanus coronatus* were found in the ARMs, similar to the previous two years. *Parastichopus parvimensis* >10cm continued to increase for the third consecutive year to 4.5/ARM, the highest recorded since we began monitoring this species in 1996. *Parastichopus parvimensis* <10cm continued to decline for the second year to 0.17/ARM indicating little recruitment.

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

## Location: Yellow Banks, Santa Cruz Island

**Site #10 SCYB**
2003 sampling dates: 7/23, 8/7, 9/22, 10/9.
2003 status: Developing kelp forest.

In 2002 we were surprised that this site was not a developing kelp forest since sea urchin densities had already decreased. The changes we had expected developed this year. The site is a thick developing kelp forest and many of the indicator species are at their highest and lowest levels since this site was added to the monitoring program in 1986. The site has mostly been devoid of macroalgae since 1997 and is now a lush developing kelp forest.

As of August 7th, there was no canopy cover over the site, but we predicted that by the end of summer there should be some canopy cover. On our last visit of 10/9, the kelp forest at this site was continuing to mature, but still had no canopy forming plants. Adult, subadult, and juvenile *Macrocystis pyrifera* densities were 0.02/$m^2$, 2.38/$m^2$, and 7.33/$m^2$ respectively, and cover was 39.5%. All of these values are the highest recorded since this site was added to the monitoring program in 1986. No adult and several juvenile *Eisenia arborea* were observed along the transect for densities of 0.0/$m^2$ and 0.042/$m^2$ respectively. This was the first time since 1997 that *E. arborea* showed up in any of the quadrats. Adult and juvenile *Pterygophora californica* densities were 1.25/$m^2$ and 0.97/$m^2$ respectively, and cover was recorded at 11.7%. Adult and juvenile *Laminaria farlowii* densities were 0.042/$m^2$ and 0.13/$m^2$ respectively, and cover was recorded at 1.2%. *Cystoseira* spp. cover was 9.7%. Miscellaneous brown algae cover increased to 3.2%. The abundances for *P. californica, E. arborea, L. farlowii, Cystoseira* spp., and miscellaneous brown algae were all the highest recorded since 1997. Miscellaneous plants, consisting of brown filamentous diatoms, declined in cover and none were observed during RPCs this year, similar to what we have observed at many of the other sites this year. Miscellaneous red algae cover was 3.7%, similar to last year. Articulated coralline algae cover was up slightly to 4.3%, the highest recorded since 1997. Encrusting coralline algae cover was 47.3% similar to last year. Bare substrate cover declined to 22.2%, the lowest recorded since 1997.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata,* covered 22.0% of the bottom, an increase from last year's coverage of 10.8%. 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. *Ophiothrix spiculata* cover was separated out from the miscellaneous invertebrate category this year and is mentioned in the echinoderm section below. Similar to most of the other sites this year, bryozoans increased in cover. Miscellaneous bryozoan cover was 6.3%, the highest recorded since 1996. *Diaperoecia californica* cover was 0.5%, similar to last year, but the highest recorded since 1996. Tunicate cover increased to 1.2%, the highest recorded since 1996. *Tethya aurantia* density declined for the fourth consecutive year and was recorded at 0.014/$m^2$, the lowest since 1996. *Lophogorgia chilensis, Muricea fruticosa*, *and M. californica* were all present and had densities of 0.164/$m^2$, 0.0083/$m^2$, and 0.021/$m^2$ respectively, similar to recent years. *Balanophyllia elegans* and *Astrangia lajollaensis* cover was 0.33% and 0.67% respectively.

*Strongylocentrotus purpuratus* density continued to decline for the third consecutive year and was relatively rare with a density of 1.21/$m^2$, the lowest density recorded since this site was added to the monitoring program in 1986. *Strongylocentrotus franciscanus* density remained low at 0.54/$m^2$, similar to last year and the lowest recorded since 1996. *Lytechinus anamesus* dramatically declined and were counted on quadrats and band transects and densities were 0.21/$m^2$ and 0.36/$m^2$ respectively. These were the lowest densities since 1997. *Whole L. anamesus* tests were common and mortality may have been a result of wasting disease or predation by *Pycnopodia helianthoides*. No *Centrostephanus coronatus* were observed on quadrats (0.0/$m^2$), the lowest density recorded since 1997. Juvenile sea

urchins of all species were rare 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 on July 8th.

*Ophiothrix spiculata* are counted in a separate category on RPCs and cover was recorded at 0.67%, noticeably lower than their cover of 6.4% in 2002. *Asterina miniata* density was 0.75/$m^2$, slightly higher than last year and the highest density recorded since this site was added to the monitoring program in 1986. This increase is similar to what we have observed at many of the other sites this year. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats, with densities of 0.042/$m^2$ and 0.075/$m^2$ respectively, and both similar to recent years. *Pycnopodia helianthoides* density continued to increase and was recorded at 0.015/$m^2$, the highest density recorded for this site since it was added to the monitoring program in 1986. No *Pachythyone rubra* were observed this year.

*Lithopoma undosum* density continued to decline for the third consecutive year, and was recorded at 0.17/$m^2$, the lowest recorded since this site was added to the monitoring program in 1986. This decline is similar to what we have observed at many of the other sites this year. *Kelletia kelletii* density was 0.049/$m^2$, higher than the past several years. *Megathura crenulata* density was 0.025/$m^2$, similar to last year and relatively high compared to the past decade. *Crassedoma giganteum* density remained low at 0.0028/$m^2$. Several *Aplysia californica* were observed and their density was higher than last year at 0.0083/$m^2$. No live *Haliotis* spp. were found along the transect this year (note: this does not include the ones found in the ARMs). Two *Haliotis assimilis* shells were found on 10/9. One measured 52 mm, was old and had a drill hole in it, and the other was fresh and was also 52mm.

Fish had higher diversity than last year, but remained at relatively low abundances. Up to five small adult *Paralabrax clathratus* were observed. Up to 63 adult and no juvenile *Chromis punctipinnis* were observed. Three adult and two juvenile *Embiotoca jacksoni* and up to two adult and 11 juvenile *Damalichthys vacca* were observed. No *Hypsypops rubicundus* were observed in 2003. Up to 41 adult *Oxyjulis californica* were observed. Four small female *Semicossyphus pulcher* were observed, but no males or juveniles were seen. Up to two female and one male *Halichoeres semicinctus* were observed. Up to 20 painted greenlings, *Oxylebius pictus,* were observed. One California scorpionfish, *Scorpaena guttata*, was observed. Two ocean whitefish, *Caulolatilus princeps*, were observed. Four adult *Sebastes atrovirens* were observed and juvenile were relatively abundant with up to 30 counted. No adult *Sebastes serriceps* were observed but juveniles were relatively common with four observed. Two adult *Sebastes chrysomelas* (black and yellow rockfish) were observed. Up to three adult *Sebastes serranoides*, and four juvenile *Sebastes serranoides/flavidus* were observed. Up to 26 KGB juvenile *Sebastes spp*. were observed. Only one small adult vermillion rockfish, *Sebastes miniatus* was observed this year. One juvenile *Sebastes* mystinus was observed. One *Lythrypnus dalli* was observed this year. *Coryphopterus* density declined from last year, but remained relatively high for this site at 1.79/$m^2$. No *Alloclinus holderi* were observed on quadrats this year, the first time since 1995 and only one was observed during the roving diver fish count. Roving diver fish counts were conducted on August 7th with four divers and on September 22nd with four divers observing 25 and 27 species of fish respectively.

Along the transect there are three groups of five ARMs at this site, one group at each end and one group in the middle of the transect. All 15 ARMs were sampled for all indicator species. Octopuses were less abundant than last year with only one observed. Small *Tegula regina* were common in the ARMs and we may want to consider adding these as an indicator species.

Similar to last year, two species of *Haliotis* were observed in the ARMs this year. One *Haliotis rufescens* measuring 38mm was found for a density of 0.07/ARM, similar to last year. Five threaded abalone, *H. assimilis*, were found in the ARMs for a density of 0.33/ARM, similar to last year. These measured 29, 36, 38, 38 and 39mm and the mean size increased to 36.0mm. Overall, the *H. assimilis* were larger and the mean size increased 10.2mm which indicates there may have been no recruitment in 2003. This is the third year this species of abalone has been observed in the ARMs at this site. No *H. sorenseni* were observed. This was the second year that no *H. corrugata* were observed in the ARMs since we began monitoring them in 1992 (possibly 1990 or 1989).

*Cypraea spadicea* density was 2.73/ARM similar to recent years. *Kelletia k*elletii were relatively common in the ARMs with a density of 0.53/ARM, the highest since 1994, and the first time they have been observed in the ARMs since 1998. Two *Lithopoma undosum* were found in the ARMs, 0.13/ARM, similar to the last two years. One small *Lithopoma gibberosum* was found in the ARMs, 0.07/ARM, similar to last year. *Megathura crenulata* density remained relatively high at 0.53/ARM, similar to last year. *Crassedoma giganteum* density was 1.13/ARM, similar to the past several years.

*Asterina miniata* density declined to 5.93/ARM, and their mean size was similar to past years at 22.6mm. *Pisaster giganteus* density also declined and was recorded at 2.47/ARM. Their mean size increased to 49.6mm indicating less recruitment than last year. Both *A. miniata* and *P. giganteus* were recorded at their highest densities in 2002. No *Pycnopodia helianthoides* were observed in the ARMs this year.

*Lytechinus anamesus* density declined to 0.07/ARM. *Strongylocentrotus franciscanus* density greatly increased to 76.18/ARM, the highest density recorded at this site since we began monitoring this species in the ARMs in 1992. Mean size was 24.81mm, a small increase from last year. *Strongylocentrotus franciscanus* density on Quadrats was low and declined this year. There was a large increase in macroalgae at this site, and it is common for *Strongylocentrotus spp*. to move into crevice habitat (such as the ARMs) when food availability is high. *Strongylocentrotus purpuratus* density was 7.91/ARM, similar to last year. Mean size of S. purpuratus increased to 16.62mm. Two *Centrostephanus coronatus* were observed in the ARMs, 0.13/ARM, the highest density since 2000. Both *C. coronatus* were small (9 and 13mm) indicating recent recruitment. Overall, recruitment of this species has been low since the 1997/1998 El Nino. *Parastichopus parvimensis* density <10cm was 0.20/ARM and >10cm was 0.60/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: Admirals Reef, Anacapa Island

**Site #11 ANAR**
2003 sampling dates: 7/10, 8/18.
2003 status: *Ophiothrix spiculata* dominated area over 2/3 of the transect and *Strongylocentrotus purpuratus* dominated area over the remaining 1/3.

Though there was a noticeable increase in macroalgae at this site, the site remains dominated by echinoderms. *Ophiothrix spiculata* continued to carpet the bottom along the eastern two thirds of the transect. *Strongylocentrotus purpuratus* remained moderately abundant on the eastern third of the transect and dominate that area. Though still rare, there were noticeably more macroalgae along the transect this year. Ten small subadult *Macrocystis pyrifera* plants were observed along the transect and measured for size frequencies. In addition, several juvenile plants were observed. Adult, subadult and juvenile *M. pyrifera* densities were 0.0/$m^2$, 0.01/$m^2$, and 0.0/$m^2$ respectively. *Macrocystis pyrifera* were absent from the transect in 2002. *Pterygophora californica*, *Laminaria farlowii*, *Agarum fimbriatum* and *Cystoseira spp*. were all absent from the transect. Several adult *Eisenia arborea* were observed along the eastern half of the transect, and juveniles were common scattered around the transect, mostly on the tops of rocks. No macroalgae were observed on quadrats this year, similar to recent years. Miscellaneous red algae continued to increase and covered 37.2% of the bottom, a large increase from last year and the highest cover recorded since 1993. Most of these algae consisted of *Laurencia pacifica*, filamentous red algae, and another algae that may have been *Peyssonelia sp*. according to Mark Readdie. The increase in red algae mostly accounts for the sharp decline in bare substrate we observed at this site. Bare substrate dramatically declined to cover 12.7% of the bottom, its lowest cover recorded since 1993. Other plants, consisting of filamentous brown diatoms, covered 2.7% of the bottom. Articulated and encrusting coralline algae cover was similar to last year at 0.33% and 38.8%, respectively.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata,* covered 15.5% of the bottom. Most of this category consisted of *Spirobranchus spinosus* and *Eugorgia rubens*. This is a similar cover for miscellaneous invertebrates as in recent years. *Ophiothrix spiculata* were separated out as a separate species this year and will be discussed in the echinoderm section below.

*Lophogorgia chilensis* density remained relatively low for this site, but similar to the previous three years at 0.049/$m^2$. *Muricea fruticosa* and *M. californica* densities were similar to previous years at 0.0028/$m^2$ and 0.032/$m^2$ respectively. *Eugorgia rubens* were relatively abundant along the transect, and their density appeared similar to last year; however, this species of gorgonian is not monitored. *Corynactis californica* remained relatively abundant for this site but appears to have declined over the past several years and had a cover of 3.7% this year. *Astrangia lajollaensis* cover continued to decline for the fourth consecutive year and was recorded at 0.17%, the lowest cover recorded at this site since monitoring began in 1982. Unlike many of the other sites this year, bryozoans decreased in cover and were recorded at 1.3%. *Diaperoecia californica* cover remained low at 0.17%.

Echinoderms continue to dominate this site and *Ophiothrix spiculata* were the most abundant, covering 38.8% of the bottom. *Ophiothrix spiculata* were most abundant along the eastern 2/3rds of the transect, but overall they were abundant everywhere. *Strongylocentrotus purpuratus* were noticeably less abundant and their density continued to decline for the third consecutive year to 8.9/$m^2$, their lowest density since 1992. *Strongylocentrotus franciscanus* density also continued to decline for the third consecutive year and was recorded at 4.3/$m^2$, the lowest density since 1991. Juvenile *S. purpuratus* and *S. franciscanus* were rare, indicating little recruitment. *Lytechinus anamesus* continued to be rare and were counted on both band transects and quadrats with densities of 0.0069/$m^2$ and 0.0/$m^2$ respectively. *Centrostephanus coronatus* density has remained relatively high and was 0.71/$m^2$, similar to the past three years. No sea urchins were observed with wasting disease on July 10th.

*Pisaster giganteus* continued to be rare with none observed in quadrats and a density 0.01/$m^2$ on 5-meter quadrats, similar to previous years. The *P. giganteus* that were present were large. *Asterina miniata* density increased for the second consecutive year and was 0.79/$m^2$, the highest density recorded since 1997. *Linckia columbiae* were relatively abundant on the western rocky end of the transect. *Parastichopus parvimensis* density remained relatively low for this site and was recorded at 0.33/$m^2$, similar to the previous three years.

*Crassedoma giganteum* density was 0.053/$m^2$, similar to last year. *Megathura crenulata* density was 0.057/$m^2$, similar to recent years. *Aplysia californica* density was 0.031/$m^2$, similar to last year. *Kelletia kelletii* density was 0.013/$m^2$, lower than last year. No *Haliotis corrugata* were observed along the transect for the fourth consecutive year. One *Panulirus interruptus* was observed on band transects for a density of 0.0014/$m^2$.

Fish continue to have relatively low abundance and a moderate diversity at this site. Similar to last year, the most abundant fish were adult *Chromis punctipinnis* and *Coryphopterus nicholsii*. Although adult *C. punctipinnis* were the most abundant fish, their abundance has been noticeably lower since the site has become an echinoderm barren. Two divers counted *C. punctipinnis* during the August 18$^{th}$ fish count and their counts were 749 and 770, remarkably close. No juvenile *C. punctipinnis* were observed this year. Several *C. punctipinnis* were observed with white patches of tissue damage that we believe is a bacterial infection caused by *Vibrio damsela* (Love et al., 1981). This infection has been observed at this site frequently in recent years. Small female *Semicossyphus pulcher* were common and one large (approximately 7kg plus) male and no juveniles were observed. Three male and seven female *Halichoeres semicinctus* were observed. Adult *Oxyjulis californica* were common with 22 observed. Painted greenlings, *Oxylebius pictus,* were moderately abundant with both adults and juveniles present, 56 were counted by one observed during a fish count. Two juvenile (YOY) and two adult *Sebastes mystinus* were observed. One juvenile (YOY) *Sebastes serranoides/flavidus* and one adult *Sebastes serranoides* were observed. No adult and at least two juvenile *Sebastes serriceps* were observed. No *Sebastes atrovirens* were observed during the fish counts this year. Several adult *Damalichthys vacca*, adult *Embiotoca jacksoni*, and adult *Medialuna californiensis* were observed. No juveniles of any of these

species were observed. Nine adult and no juvenile *Hypsypops rubicundus* were observed. At least two *H. rubicundus* nests were observed along the transect. Adult *Girella nigricans* were common. *Coryphopterus nicholsii* density was 1.7/$m^2$, similar to the last several years. *Alloclinus holderi* density was 0.46/$m^2$, the highest density recorded since 1998. However, only six were observed during the roving diver fish count. I think this density is a little out of proportion than what is along the transect and may be a result of sampling variability. Roving diver fish counts were conducted on July 10$^{th}$ with six divers observing 23 species of fish and on August 18$^{th}$ with six divers observing 19 species of fish.

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 continued to decline to 0.33/ARM, the lowest density recorded at this site. *Megathura crenulata* density was 0.67/ARM, lower than last year. *Crassedoma giganteum* density was 0.83/ARM; the lowest since monitoring in the ARMs began at this site in 1992. *Asterina miniata* density remained high and was 16.0/ARM, the highest density recorded at this site. Most were small with a mean size of 22.9mm, slightly lower than the past several years, but the lowest recorded at this site indicating recent recruitment. *Pisaster giganteus* continued to be rare and none were observed in the ARMs this year, similar to 2002. *Lytechinus anamesus* density continued to decline and none were observed this year. *Strongylocentrotus franciscanus* density was similar to last year at 13.17/ARM, but still was relatively low for this site. Their mean size continued to increase for the fourth consecutive year to 27.5mm indicating little recruitment. *Strongylocentrotus purpuratus* density continued to decline for the fourth consecutive year and was recorded at 15.33/ARM, the lowest density recorded for the ARMs at this site. Mean size was similar to last year at 16.4mm. *Centrostephanus coronatus* density continued to decline for the fifth consecutive year to 0.17/ARM, their lowest density 1992. Inversely, their mean size has gradually increased for the fourth consecutive year to 56.0mm. No *Parastichopus parvimensis* >10cm were found in the ARMs and the mean density of <10cm animals was 0.67/ARM similar to last year. No Octopi were found in the ARMs this year.

One *Arbacia incisa* measuring 44mm was found in ARM #2443. Last year, one *A. incisa* was found, but it was in ARM #2442. ARMs 2442 and 2443 are next to each other so it is possible it is the same *A. incisa* and it moved.

The temperature loggers were retrieved and deployed and all data were successfully downloaded. The temperature housing flooded and the Stowaway™ temperature logger was ruined, however, the waterproof Tidbit™ logger was working properly.

## Location: Cathedral Cove, Anacapa Island

**Site #12 ANCC**
2003 sampling dates: 7/11, 7/25, 10/6.
2003 status: Sparse kelp forest with areas dominated by *Strongylocentrotus franciscanus*.

Unlike most of the other sites this year, this site has changed little. Algal cover remains relatively low for this site and appears to be a result of grazing by *Strongylocentrotus franciscanus*. Similar to the last several years the algae was not evenly distributed along the transect. There were areas dominated by *Strongylocentrotus franciscanus* and areas that had an abundance of algae and few *S. franciscanus*. Most of the areas that had algae had high relief were the tops of large rocks that act as a refuge from *Strongylocentrotus spp*. *Macrocystis pyrifera* canopy cover was estimated at 20% on July 25th. Most of the *M. pyrifera* plants were healthy. Adult, subadult, and juvenile *M. pyrifera* densities all increased and were 0.02/$m^2$, 0.085/$m^2$, and 1.46/$m^2$ respectively and had a cover of 0.17% which is similar to last year. Several 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. No *E. arborea* were observed on quadrats this year. Adult and juvenile *Laminaria farlowii* remained relatively low for this site with densities of 0.0/$m^2$ and 0.083/$m^2$ respectively. Small *Cystoseira s*pp. plants were present, but were relatively rare for this site with a cover of 0.67%, similar to last year. No brown algae, *Coilodesme sp*. were observed on the *Cystoseira spp*. this year. Miscellaneous brown algae cover remained low and was recorded at 2.0%. Miscellaneous red algae cover was 5.8%,

higher than last year. Miscellaneous plants, consisting of filamentous brown diatoms covered 3.0% of the bottom, lower than last year. Articulated coralline algae cover was 8.8%, similar to last year, but low for this site. Encrusting coralline algae cover was 62.5%, similar to previous years. Bare substrate cover was 9.7%, lower than last year and relatively low for this site.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata*, covered 9.2% of the bottom, a decline from last year. The most common miscellaneous invertebrates were hydroids, and Christmas tree worms, *Spirobranchus spinosus*. Similar to previous years, *O. spiculata* were not present at this site. Similar to other sites this year, miscellaneous bryozoans increased in cover to 10.0%, higher than the last two years. *Diaperoecia californica* were common on the sides of steep rocks and reef, but there was not much directly along the transect with a cover of 1.5%, similar to past years. Gorgonians were rare at this site, with only two *Lophogorgia chilensis* observed on band transects, 0.0028/$m^2$. Sponge cover was recorded at 3.0%, relatively high and the highest cover recorded at this site since this category was added in 1985. Tunicate cover was 2.8%, similar to last year.

*Strongylocentrotus franciscanus* and *Strongylocentrotus purpuratus* densities were similar to last year at 4.33/$m^2$ and 1.13/$m^2$ respectively. High density patches of *S. franciscanus* were scattered around the transect. Overall there were few *S. purpuratus* directly along the transect, but there were patches of moderately high density at a depth of about 5 m inshore of the transect. Similar to the last two years, both *S. franciscanus* and *S. purpuratus* were out in the open and not confined to crevices like they usually are at this site. *Centrostephanus coronatus* density remained low and was 0.042/$m^2$.

Similar to most of the other sites this year, *Asterina miniata* density increased and they were relatively abundant for this site at 0.75/$m^2$, the highest density recorded since monitoring began at this site in 1982. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.083/$m^2$ and 0.04/$m^2$ respectively, similar to the past several years. *Parastichopus parvimensis* density was 1.0/$m^2$, lower than the last several years.

*Lithopoma undosum* density declined to 2.42/m², the lowest density since 1993. Small/juvenile *L. undosum* were common. Similar to other sites this year, *Crassedoma giganteum* density declined and was recorded at 0.039/$m^2$, the lowest recorded since 1985. *Aplysia californica* density was low at 0.0069/$m^2$. No *Aplysia vaccaria* were observed this year. No *Haliotis corrugata* (0.0/$m^2$) were observed during band transects for the third consecutive year, and none were observed along the entire transect. This is the second year that no *H. corrugata* have been observed at the site. *Serpulorbis squamigerus* abundance remained low for this site and there were none observed on RPCs for the first time since monitoring began at this site in 1982. *Panulirus interruptus* density was 0.018/$m^2$, similar to last year. *Kelletia kelletii* were rare with none observed on band transects. This was strikingly different from last year when they were abundant last year with breeding aggregations.

Fish were abundant and diverse as usual for this site. One tagged *Hypsypops rubicundus* was observed on October 7th. We believe that this is one of the *H. rubicundus* that was tagged in 1985. Adult *H. rubicundus* were abundant and one large juvenile was observed. Adult Chromis punctipinnis were common and no juveniles were observed along the transect this year. Adult *Embiotoca jacksoni* were common and several juveniles were observed. Several adult and at least one juvenile *Damalichthys vacca* were observed. *Brachyistius frenatus* were moderately abundant in the kelp canopy. Several female but no male or juvenile *Semicossyphus pulcher* were observed. Several female and only one male *Halichoeres semicinctus* were observed. Adult *Oxyjulis californica* were common and a few juveniles were observed. Juvenile giant kelpfish, *Heterostichus rostratus* were common in the kelp canopy. Adult *Paralabrax clathratus* were common, no juveniles were observed. Several adult and juvenile *Sebastes atrovirens* were observed. One juvenile *Sebastes mystinus* was observed this year. Several small adult *Sebastes serranoides* and several juvenile *Sebastes serranoides/flavidus* were observed. Two adult and five juvenile *Sebastes serriceps* were observed. Juveniles were notably more abundant than usual, similar to what we have observed at other sites this year. Adult *Girella nigricans* were common. *Oxylebius pictus* were common. No *Lythrypnus dalli* or *Lythrypnus zebra* were observed. *Coryphopterus nicholsii* density increased to 1.54/$m^2$, the highest recorded since 1989. This increase is

similar to what has been observed at other sites this year. *Alloclinus holderi* density has gradually decrease the past two years, but they remained common with a density of 0.63/$m^2$. Roving diver fish count was conducted on July 11th with seven divers observing 24 species of fish and on July 25 with four divers observing 26 species of fish.

Tagged *Semicossyphus pulcher* were common along the transect. These fish were tagged by Jen Caselle with the PISCO project through UCSB.

All seven ARMs were monitored for all indicator species. Five ARMs cages were replaced this year. One octopus was found in the ARMs this year. Overall, there has been very little change in the ARMs since last year.

No *Haliotis* spp. were observed in the ARMs for the second consecutive year. This is third time since 1994 none have been found at this site. *Cypraea spadicea* density was 12.9/ARM, slightly higher than last year, similar to previous years, and still relatively abundant compared to other sites. *Lithopoma undosum* density was 1.00/ARM, similar to the past several years. *Crassedoma giganteum* density was 2.29/ARM, slightly lower than the past several years.

*Asterina miniata* density remained the highest recorded and was the same as last year at 12.7/ARM. Mean size of *A. miniata* continued to gradually increase for the sixth consecutive year and was recorded at 28.9mm. *Pisaster giganteus* density was slightly lower than last year at 4.14/ARM, but still relatively high for this site. Mean size of *P. giganteus* declined to 27.7mm.

*Strongylocentrotus franciscanus* density remained about the same and was 50.6/ARM, and their mean size was similar at 31.0mm. *Strongylocentrotus purpuratus* density declined slightly to 90.9/ARM, and their mean size was similar to last year at 36.2. *Centrostephanus coronatus* density continued to decline for the fifth year and none were observed in the ARMs this year, the lowest density since 1997. *Parastichopus parvimensis* were abundant in the ARMs with densities of 4.43/ARM for animals <10cm and 11.4/ARM for >10cm. This is the highest density for animals >10cm and the highest combined the highest density recorded in the ARMs at this site since we began monitoring this species in 1996.

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

## Location: Landing Cove, Anacapa Island

**Site #13 ANLC**
2003 sampling dates: 8/8, 9/12, 10/7.
2003 status: Open developing kelp forest.

Canopy cover of *Macrocystis pyrifera* was estimated at 10% on August 8$^{th}$. Low canopy cover is common at this site and is probably a result of high boat traffic in the Cove. However, in August there were few potential canopy forming adult *M. pyrifera* and all of these were on the shallow reef at the eastern side of the transect. The middle area of the transect had an abundance of juvenile and subadult *M. pyrifera*, many of which were only several meters high. Most of these plants are attached to cobble and as the plants grow they float away since the cobble is not heavy enough to anchor them. Understory brown macroalgae were more abundant than last year.

Adult, subadult, and juvenile *M. pyrifera* densities were 0.015/m², 1.65/m², and 8.88/m² respectively, and covered 34.8% of the bottom. This subadult density represents one of the highest recorded at this site and the juvenile density represents the highest recorded since monitoring began for this category at this site in 1983. The top of the reef at the east end of the transect appeared similar to past years with an abundant and diverse coverage of algae, while the deeper areas of the transect had noticeably more brown macroalgae. Adult and juvenile *Eisenia arborea* densities were similar to last year at 0.75/$m^2$ and 1.17/$m^2$ respectively and a cover of 23.3%. These are all some of the highest abundances recorded for *E. arborea* at this site. *Pterygophora californica* was more abundant than last year, but most plants were small with adult and juvenile

densities at 0.0/$m^2$ and 0.29/$m^2$ respectively, and cover was 0.33%. Adult and juvenile *Laminaria farlowii* densities increased and were 0.88/$m^2$ and 6.46/$m^2$ respectively, and cover was 14.3%, all relatively high for this site. Similar to past years, *L. farlowii* is patchy at this site. Miscellaneous brown algae cover was recorded at 12.8%, similar to last year. *Cystoseira* spp. were more abundant than the last two years with a cover of 5.5%. Miscellaneous red algae cover was 13.0%, similar to previous years. Most of the miscellaneous red algae were present on top of the reef at the east end of the transect. *Gelidium* spp. cover was 19.2%, similar to the past 14 years. All of the *Gelidium* spp. were present on top of the reef at the eastern end of the transect, similar to previous years. Miscellaneous plants cover decreased to 0.17%, similar to what we have observed at other sites this year. Articulated and encrusting coralline algae covered 14.2% and 36.5% of the bottom respectively, similar to previous years. Bare substrate covered 15.2% of the bottom, similar to last year.

Miscellaneous invertebrates, excluding *Ophiothrix spiculata* (which have been virtually absent from this site since monitoring began), cover continued to decrease for the second year and was recorded at 3.7%, the lowest cover recorded at this site since monitoring for this category began in 1983. The most abundant invertebrates in this category were Christmas tree worms, *Spirobranchus spinosus*. Miscellaneous bryozoans and *Diaperoecia californica* covers were 16.7% and 3.3% respectively, similar to last year. Most of the miscellaneous bryozoans were *Membranipora spp*. encrusting the *Gelidium robustum* on the eastern end of the transect. Tunicate cover continued to increase for the fourth consecutive year and was recorded at 14.5%, the highest cover recorded since monitoring began. This increase in tunicate cover is similar to what we have observed at other sites this year. Sponges were relatively abundant as usual for this site with a cover of 3.33%. *Corynactis californica* cover continued to decline and had a cover of 1.17%, relatively low for this site. *Lophogorgia chilensis* continued to increase for the fourth consecutive year and was recorded at its highest density for this site, 0.014/ $m^2$.

Both *Strongylocentrotus franciscanus* and *S. purpuratus* densities were similar to recent years and were recorded at 3.75/$m^2$, and 3.96/$m^2$ respectively. *Centrostephanus coronatus* were common on the shallow reef at the eastern end of the transect. Their density was 0.042$m^2$, similar to the last two years. *Parastichopus parvimensis* density was 1.08/$m^2$, similar to the last several years. Emergent *Asterina miniata* were rare as usual and none were observed on quadrats. Emergent *Pisaster giganteus* were also rare as usual and they were counted on quadrats and 5-meter quadrats for densities of 0.083/$m^2$, and 0.015/$m^2$ respectively. No sea star wasting disease or sea urchin wasting disease was observed at this site.

*Haliotis corrugata* remained rare with one observed on band transects for a density of 0.0014/$m^2$. Only four large *H. corrugata* were observed along the transect. At least three of these we have been observing for several years, including a pair that has been together for at least three years now. No fresh shells and a few old shells were observed. *Lithopoma undosum* density continued to decline for the second year and was 1.17/$m^2$, low compared to recent years. This is one of the few sites where *L. undosum* density did not decline this year. *Crassedoma giganteum* were abundant along the vertical walls at this site and they were counted on both band transects and quadrats this year. Their densities were 0.31/$m^2$ and 0.63/$m^2$ respectively. *Aplysia californica* density was 0.0014/$m^2$. No *Cypraea spadicea* were observed on quadrats this year. *Megathura crenulata* density was 0.018/$m^2$, similar to recent years.

Adult *Chromis punctipinnis* were common with up to 326 observed. Juvenile *C. punctipinnis* were rare with only two observed on September 12$^{th}$. Adult *Hypsypops rubicundus* were moderately abundant along the shallow parts of the transect and one observer counted 15, no juveniles were observed. Adult *Embiotoca jacksoni* were common with 17 observed, and two juveniles were observed. Several adult striped surfperch were observed, these are not very common for Anacapa Island. Kelp surfperch, *Brachyistius frenatus*, were common in the kelp canopy with up to 73 counted. Adult *Girella nigricans* were abundant with up to 67 counted. *Damalichthys vacca* were uncommon with only two adults observed. Adult *Medialuna californiensis* were common. *Semicossyphus pulcher* were moderately abundant with up to 11 females, 7 males and two juveniles observed this year. Many of the male and female *S. pulcher* were tagged. Male and female *Halichoeres semicinctus* were common. Adult *Oxyjulis californica* were common with up to 60 observed. Juveniles were rare with only four observed. Adult

*Paralabrax clathratus* were moderately abundant with up to 21 counted. No juveniles were observed this year. No *Sebastes mystinus* were observed. Three adult *Sebastesserriceps* were observed. Juvenile *S. serriceps* were abundant with up to 15 counted along the transect, similar to what we have observed at other sites this year. Three adult *Sebastes atrovirens* were observed, and juveniles were relatively abundant with 11 counted. Juvenile KGB (*Sebastes spp.)* were common on the bottom with eight counted. One adult *Sebastes serranoides* was observed. One juvenile *Sebastes serranoides/flavidus* was observed. Six juvenile *Bocaccio Sebastes paucispinis* were observed on each of the fish counts. *Coryphopterus nicholsii* were relatively abundant and density increased to 1.5/$m^2$, the highest recorded at this site since 1988. *Alloclinus holderi* density was relatively high at 0.67/$m^2$. No *Lythrypnus dalli* were counted in quadrats, and they were rare along the wall with three observed. *Lythrypnus zebra* were common with at least 11 observed. Roving diver fish counts were conducted on August 8$^{th}$ with five divers observing 26 species of fish and on September 12$^{th}$ with four divers observing 28 species of fish.

In 2002, Dr. Jen Caselle, a researcher at UCSB, in cooperation with a Commercial fisherman tagged a large quantity of fish (many different species) in the reserve to look at reserve effects. Many tagged *Semicossyphus pulcher* were observed at both Landing Cove and Cathedral Cove this year.

Five ARMs were monitored for all indicator species and two were monitored for all except *Strongylocentrotus franciscanus* and *S. purpuratus*. The latter were not monitored because of their high abundance and lack of sampling time. One octopus was found in the ARMs this year. *Tegula regina* were common and 18 (2.57/ARM) were found in the ARMs this year. Their size ranges were between 19 – 42mm.

Similar to the last two years, one *Haliotis corrugata*, measuring 38mm, was found in an ARM (0.14/ARM). *Cypraea spadicea* density was 4.71/ARM, similar to the past several years. No *Lithopoma undosum* were observed in the ARMs for the first time since we began monitoring the ARMs at this site in 1992. Two small *Megathura crenulata* were found in the ARMs, 0.29/ARM. *Crassedoma giganteum* density was 3.14/ARM, similar to previous years.

*Asterina miniata* remained abundant and their density was similar to last year at 12.0/ARM. The mean size of *A. miniata* continued to gradually increase for the fifth consecutive year and was 26.1mm, the largest recorded at this site. *Pisaster giganteus* density was 1.43/ARM and mean size was 31.2mm, similar to recent years.

*Strongylocentrotus franciscanus* density increased to 74.4/ARM, but was similar to the density in 2001. Mean size decreased slightly to 30.4mm. Similarly, *S. purpuratus* density increased to 141.4/ARM, close to the density in 2001. Mean size of *S. purpuratus* decreased to 26.5mm. Similar to the last two years no *Centrostephanus coronatus* were observed in the ARMs this year. *Parastichopus parvimensis* density <10 cm was the same as last year at 1.57/ARM, and their density >10cm remained high at 4.29/ARM.

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

## Location: Southeast Sea Lion Rookery, Santa Barbara Island

**Site #14 SBSESL**
2003 sampling dates: 7/8, 8/19.
2003 status: Developing kelp forest over about half the transect with the other half dominated by *Ophiothrix spiculata*.

This site continued to change dramatically for the second consecutive year. Similar to the other two sites at Santa Barbara Island, many of the indicator species are at or near 22 year abundance highs or lows with much of this change being unprecedented since the monitoring program began in 1982. On 8/19, we observed a noticeable increase in height of the existing *Macrocystis pyrifera* plants, although there were no other noticeable changes from our previous visit.

*Strongylocentrotus purpuratus* densities continued to decline and this appears to be the driving force of the recent change at this site. Much of the site continues to be dominated by *Ophiothrix spiculata*, but these have stabilized or declined. Macroalgae continued to increase at the site and were notably more abundant than last year, or any year since 1994. Similar to last year, most of the macroalgae were present along the southern half of the transect, but there were notably more algae on the northern half than in 2002. There was no *Macrocystis pyrifera* canopy cover over the transect, but there were several small adult *M. pyrifera* plants that were within several meters of the surface. Adult, subadult and juvenile *M. pyrifera* were all common at the site with densities of 0.2/$m^2$, 0.15/$m^2$ and 0.29/$m^2$ respectively and cover was recorded at 6.0%. These are the highest densities recorded since 1994. Most of the *M. pyrifera* appeared healthy, but some of the blades were covered with epiphytic bryozoans. Several adult and juvenile *Eisenia arborea* were observed along the transect and their densities were 0.0/$m^2$ and 0.083/$m^2$ respectively and had a cover of 0.83%. Though low, this is the highest density of *E. arborea* recorded on quadrats since monitoring began and the highest cover since we monitored this species separately in 1993. No *Laminaria farlowii* or *Pterygophora californica* were observed. *Cystoseira spp.* were common, but mostly on the southern half of the transect. Most of the plants were small and cover was recorded at 4.0%, the highest recorded since 1994. Most or all of the *Cystoseira spp.* were *C. osmundacea*. Miscellaneous brown algae covered 3.7% of the bottom, similar to last year. *Sargassum muticum* were common, but were in poor condition with many epiphytes covering the plants. This species of algae is seasonal and typically grows in the winter months. I presume the cooler waters we have experienced this year may have extended its lifespan some. Small *Egregia menziesii* plants were common. This was the first time I have observed this species of algae at this site, as it typically grows in shallow areas less than about 30ft. This species of algae was more abundant at Arch Point than it has been in many years. Other brown algae that were common included *Pachydictyon sp., Dictyoneuropsis undulata* and *Colpomenia sp.* Miscellaneous red algae were relatively abundant and diverse for this site with a cover of 12.5%, the highest cover recorded since 1984. Mark Readdie identified many of the species and listed them in the species list. *Laurencia pacifica* were common, especially on the northern end of the transect. Other green algae covered 3.2% of the bottom, the highest recorded at this site since monitoring of this category began in 1985. This category consisted entirely of *Codium setchellii* which were more abundant than I have seen anywhere. These algae covered relatively large areas (some patches were at least 0.5 $m^2$) on the northern end of the transect. Miscellaneous plants consisting of filamentous brown diatoms covered 1.6% of the transect, a large decrease from 2002. Articulated and encrusting coralline algae covered 0.17% and 55.0% respectively of the bottom which is similar to recent years. Bare substrate covered 22.2% of the bottom and has gradually declined over the last three years, but was only slightly lower than 2002.

The most common miscellaneous invertebrates encountered on RPCs, excluding *Ophiothrix spiculata,* were the small anemone *Sagartia/Cactosoma* and tube worms. This category covered 4.0% of the bottom. *Ophiothrix spiculata* also decreased in abundance. *Ophiothrix spiculata* has now been separated out from miscellaneous invertebrates on RPCs and will be discussed below in the section on echinoderms. *Corynactis californica* remained relatively common for this site and cover was recorded at 2.7%, similar to last year. *Astrangia lajollaensis* cover continued to be relatively low at this site and was 1.0%, similar to last year. *Balanophyllia elegans* cover remained low, similar to the previous five years. Tunicate cover was recorded at 3.8%, similar to last year. Similar to last year, the most common tunicate was *Pycnoclavella stanleyi*. Miscellaneous bryozoans continued to increase in cover and were recorded at 7.3%, the highest recorded cover for this category since we began monitoring it in 1985. *Diaperoecia californica* cover was recorded at 0.5%, the highest cover and the first time it has been observed on RPCs since 1994. In general, bryozoan cover has increased at most of the monitoring sites this year. *Tethya aurantia* density was 0.10/$m^2$, similar to last year, but relatively low for the mid to late 1990's. *Lophogorgia chilensis* density has gradually declined over the last three years and was recorded at 0.13/$m^2$, the lowest since 1995. As usual for this site, *Muricea californica* were common, while *M. fruticosa* were rare. Their densities were 0.017/$m^2$ and 0.0056/$m^2$ respectively.

*Strongylocentrotus purpuratus* density continued to decline and was recorded at 0.25/$m^2$, the lowest density recorded at this site since monitoring began in 1982. *Strongylocentrotus franciscanus* density

was higher than last year at 4.1/$m^2$, but similar to recent years. *Strongylocentrotus franciscanus* were out in the open and not confined to crevices. The *S. purpuratus* were also out in the open, but nearly all of them on the north end of the transect were completely covered with debris which consisted mostly of the red algae, *Laurencia pacifica*. Small *S. franciscanus* were common under the spine canopy indicating some recruitment. However, few small *S. purpuratus* were observed indicating low recruitment for this species. *Lytechinus anamesus* density continued to decline for the fourth consecutive year and was recorded at 0.0056/$m^2$, the lowest density recorded at this site since we began monitoring this species on band transects. *Centrostephanus coronatus* density declined for the second consecutive year and was recorded at 0.63/$m^2$, the lowest since 1997. All of the *C. coronatus* were large adults with no small individuals observed indicating little recruitment. No sea urchin wasting disease was observed on July 8th. No *Arbacia incisa* were observed in quadrats or directly along the transect this year.

Although parts of the transect were dominated by *Ophiothrix spiculata*, their cover decreased substantially and was recorded at 21.2%. In 2002 it was recorded at 35.6%. *Ophiothrix spiculata* were mostly present on the northern half of the transect, and relatively uncommon on the southern half.

*Asterina miniata* density was similar to the last several years and was 0.42/$m^2$ which remains relatively high compared to the past 22 years. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.083/$m^2$ and 0.065/$m^2$ respectively, similar to last year. *Pycnopodia helianthoides* density was slightly higher than the last several years at 0.0083/$m^2$, and was the highest density recorded for this site since we began monitoring this species. *P. helianthoides* is probably playing a major role in the continued decline of *Strongylocentrotus purpuratus*. We observed several intact fresh *S. purpuratus* tests near a *P. helianthoides*, an indication of recent predation. No sea star wasting disease was observed on July 8th. *Parastichopus parvimensis* density was 0.38/$m^2$, and remained near its lowest density at this site since monitoring began in 1982. We observed one boat actively fishing for *P. parvimensis* around the Island.

*Lithopoma undosum* density was 0.71/$m^2$, similar to the previous two years. Small *L. undosum* were common. *Megathura crenulata* density was higher than last year at 0.0083/$m^2$, similar to previous years. No live *Haliotis spp.* were observed for the ninth consecutive year. Several very old *H. corrugata* shells were present, but not collected. *Aplysia californica* were relatively rare and their density was 0.0069/$m^2$, the lowest recorded since 1994. *Crassedoma giganteus* density was 0.0042/$m^2$, similar to previous years. No pencil oysters, *Pteria sterna,* were observed, this is the first time since 1998 we have not observed this warm water species that settled out during the 1997/98 El Niño.

Fish abundance was low, but diversity was higher than it has been in recent years. This is probably a result of more algae being present at the site. 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 about 20 observed. No juvenile *C. punctipinnis* were observed. Small adult *Oxyjulis californica* were common with 134 counted by one observer. Two small female and no male or juvenile *Semicossyphus pulcher* were observed. One male and two or three female *Halichoeres semicinctus* were observed. Painted greenling, *Oxylebius pictus,* were common with up to 23 observed. Several KGB juvenile *Sebastes* were observed. One adult *Sebastes atrovirens* and two juveniles (YOY) were observed. Seven ocean whitefish, *Caulolatilus princeps* were observed. A school of tubesnouts, *Aulorhynchus flavidus*, was observed; this is highly unusual for this Island. Two juvenile Cabezon, *Scorpaenichthys marmoratus*, were observed. Six adult *Hypsypops rubicundus* were observed, but no juveniles. Several adult and juvenile *Embiotoca jacksoni* were observed. Several adult *Girella nigricans* were observed. Two small adult *Paralabrax clathratus* were observed. *Coryphopterus nicholsii* density was 0.71/$m^2$, lower than last year but still relatively abundant for this site. *Alloclinus holderi* density was similar to last year at 0.42/$m^2$. Roving diver fish counts were conducted on July 8th with five divers observing 20 species of fish, and on August 19th with four divers observing 20 species of fish.

The temperature loggers were retrieved and deployed on two different dates this year. During the first installation of the loggers, the computer that deployed the units was not set at the correct date and time, so the units were reinstalled on our second visit to the site. The information that was collected since the

first visit was corrected so that the data downloaded into the KFM Access data base is corrected for this time error.

## Location: Arch Point, Santa Barbara Island

Site #15 SBAP
2003 sampling dates: 7/9, 8/19.
2003 status: Developing kelp forest.

Similar to the other two sites at Santa Barbara Island, many of the indicator species are at or near 22 year abundance highs or lows with much of this change being unprecedented since the monitoring program began in 1982.

This site has changed dramatically since last year. Similar to the other two sites at this Island, *Strongylocentrotus purpuratus* densities are at their lowest densities since monitoring began, and there are noticeable increases in macroalgae. Only one small subadult and several juvenile *Macrocystis pyrifera* plants were observed along the transect. None were observed on quadrats or RPCs. No *Pterygophora californica* or *Laminaria farlowii* were observed along the transect. Juvenile *Eisenia arborea* were the only macroalgae observed in quadrats this year with a density of 1.38/ $m^2$ and a coverage of 6.2%. This is the highest density recorded for this species since monitoring began in 1982, and the highest cover since we began monitoring this species separately in 1993. No adult *E. arborea* were observed along the transect. *Desmarestia spp*. were present along the transect for the first time since 1989 and had a cover of 1.5%, the highest recorded at this site. Several small *Cystoseira spp*. plants were present and were recorded on RPCs for the first time since 1994 with a cover of 0.67%. *Egregia menziesii* were noticeably more abundant than I have observed at this site, similar to what we observed at Southeast Sea Lion. Several adult plants were observed and juvenile plants were common. Miscellaneous brown algae were more abundant than it has been since 1994 and consisted mostly of *Colpomenia sp*., *Egregia sp*., and *Pachydictyon sp*. Much of the bottom was covered with brown filamentous diatoms with the hydroid, *Obelia sp*., mixed in. Miscellaneous plants, consisting of brown filamentous diatoms, covered 39.0% of the bottom, the highest cover since this group was first sampled in 1985. Miscellaneous red algae covered 13.7% of the bottom, a decrease from the previous two years. Articulated coralline algae covered 8.3% of the bottom, the highest cover since 1998. Encrusting coralline algae covered 37.0% of the bottom, similar to the past three years. Bare substrate cover was 11.0%, lower than the previous three years.

The most common miscellaneous invertebrate, excluding *Ophiothrix spiculata,* encountered on RPCs was the hydroid, *Obelia sp*. This category covered 17.3% of the bottom, an increase from last year, and was a result of the increase in *Obelia sp*. *Corynactis californica* cover decreased to 1.8%, notably lower than the previous three years. *Astrangia lajollaensis* cover was 0.5%, similar to previous years. Tunicate cover was recorded at 4.7%, the highest cover recorded at this site, but similar to 1994. The most common tunicate was *Pycnoclavella stanleyi* and *Aplidium sp*. Miscellaneous bryozoans cover continued to increase and was recorded at 6.8%, the highest recorded for this category since 1994. *Diaperoecia californica* cover was recorded at 0.0%, similar to past years, but this bryozoan was noticeably more common on the sides of the large rocks along the transect. The increase in bryozoan cover at this site is similar to what we have observed at most of the other sites this year. *Lophogorgia chilensis*, *Muricea fruticosa*, and *M. californica* were all present, but uncommon as usual for this site. Their densities were 0.0042/$m^2$, 0.0028/$m^2$ and 0.0014/$m^2$ respectively.

*Strongylocentrotus purpuratus* density dramatically declined to 3.87/$m^2$, the lowest density recorded at this site since monitoring began in 1982. In 2002, *S. purpuratus* density was recorded at 103.0/$m^2$. *Strongylocentrotus franciscanus* density was higher than last year at 10.8/$m^2$, but similar to recent years. Juvenile S. purpuratus and S. franciscanus were rare at this site. *Lytechinus anamesus* were uncommon with a density of 0.022/$m^2$, similar to the last several years. *Centrostephanus coronatus* density declined for the fourth consecutive year and was recorded at 0.083/$m^2$, the lowest since 1997. 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* density continued to increase for the second year and was recorded at 1.29/$m^2$, the highest density recorded at this site since monitoring began in 1982. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.29/$m^2$ and 0.09/$m^2$ respectively. *Pisaster giganteus* quadrat density increased to its highest level recorded at this site, while its 5-meter density decreased from last year, so the increase may be a sampling artifact. *Pycnopodia helianthoides* were relatively abundant for this site with a density of 0.0042/$m^2$, the highest recorded for this site since we began monitoring this species. Whole *S. purpuratus* tests were common near the *P. helianthoides* and were probably a result of predation. No *Ophiothrix spiculata* were observed on RPCs this year. *Parastichopus parvimensis* density was 0.17/$m^2$, similar to its density over the last few years at this site

*Lithopoma undosum* density continued to decline for the fourth consecutive year and was recorded at 0.12/$m^2$, the lowest density since this site was established in 1982. *Megathura crenulata* density was 0.0028/$m^2$, similar to previous years. No live *Haliotis spp.* were observed. *Aplysia californica* were relatively rare and their density was 0.0069/$m^2$, the lowest recorded since 1994. *Crassedoma giganteus* density was 0.0097/$m^2$, similar to previous years.

Adult *Chromis punctipinnis* were abundant as usual for this site and one observer counted up to 714, however only a few juveniles were observed on August 19th. As usual for this site, adult *Hypsypops rubicundus* were relatively abundant along the transect as were their nests. As many as 43 adults were counted. Similar to the last several years, no juvenile *H. rubicundus* were observed, but there were several medium sized (over 15cm) *H. rubicundus* that still had one or two blue spots on them. No tagged *H. rubicundus* was observed this year. Adult *Oxyjulis californica* were common with up to 39 observed, however juveniles were rare with only two observed. Two small male, four small female, and one juvenile *Semicossyphus pulcher* were observed. No *Halichoeres semicinctus* were observed this year. Small adult *Paralabrax clathratus* were common with up to 11 observed. Adult *Girella nigricans* were common with up to 14 observed. Several *Medialuna californiensis* were observed. Painted greenlings, *Oxylebius pictus*, were common. One adult and one juvenile *Embiotoca jacksoni* were observed. One adult and one juvenile *Sebastes serriceps* were observed. One KGB *Sebastes sp*. YOY was observed. One grass rockfish (*Sebastes rastrelliger*) was observed. *Coryphopterus nicholsii* were noticeably more abundant in the sandy areas on the offshore side of the transect than in past years. Their density on quadrats was 0.42/$m^2$, the highest density recorded since 1988. *Alloclinus holderi* were relatively abundant with up to 77 observed and a density of 2.46/$m^2$, the highest recorded since 1997. Snubnose sculpin, *Orthonopias triacis*, were common. Roving diver fish counts were conducted on July 9th with four divers observing 16 species of fish and on August 19th with six divers observing 17 species of fish.

The temperature loggers were retrieved and deployed and all data were successfully downloaded. Both temperature loggers were recording within specifications.

We noted that several eyebolts need to be replaced along this transect.

## Location: Cat Canyon, Santa Barbara Island

**Site #16 SBCAT**
2003 sampling dates: 7/9, 8/18.
2003 status: Developing kelp forest.

Similar to the other two sites at Santa Barbara Island, many of the indicator species are at or near 18 year abundance highs or lows with much of this change being unprecedented since this site was installed in 1986.

This site has changed dramatically since last year. Similar to the other two sites at this Island, *Strongylocentrotus purpuratus* densities are at their lowest densities since monitoring began, and there are noticeable increases in macroalgae. *Macrocystis pyrifera* canopy cover over the transect was estimated at 10% on July 9th. Dense patches of canopy forming *M. pyrifera* were present east and west of the transect about 100 meters. Small adult, subadult, and juvenile *M. pyrifera* were all present with densities at 0.0/$m^2$, 0.03/$m^2$ and 0.29/$m^2$ respectively, and cover was recorded at 0.33%. Large juvenile Eisenia arborea were moderately abundant, but there were only a few adult plants present, similar to Arch Point. Adult and juvenile *E. arborea* densities were 0.0/$m^2$, and 0.29/$m^2$ respectively and cover was recorded at 0.17%. This is the highest density recorded for juveniles since they were separated out on quadrats in 1996. No *Pterygophora californica* or *Laminaria farlowii* were observed along the transect. A small amount of *Desmarestia sp*. were present along the transect for the first time since 1995 with a cover of 0.17%. Miscellaneous brown algae increased dramatically to a cover of 17.0%, the highest since 1995. The most common miscellaneous brown algae were *Colpomenia sp*. and *Pachydictyon coriaceum*. Miscellaneous plants, consisting of brown filamentous diatoms, covered 26.8% of the bottom, the highest cover since this species was first sampled in 1986. Miscellaneous red algae mostly consisting of *Laurencia pacifica* covered 6.8% of the bottom, the highest cover since 1997. Articulated coralline algae cover was 6.3%, the highest since 1996. Encrusting coralline algae cover was 68.0%, relatively high for this site. Bare substrate cover was recorded at 8.5%, the lowest cover since 1995.

The most common miscellaneous invertebrates, excluding *Ophiothrix spiculata,* encountered on RPCs were the hydroid, *Obelia sp*. and *Spirobranchus spinosus*. This category covered 3.5% of the bottom. *Astrangia lajollaensis* cover was 0.83%. Tunicate cover was recorded at 6.8%, the highest cover since 1996. The most common tunicates were the unidentified colonial gray tunicate with white dots, *Aplidium sp*. and *Pycnoclavella stanleyi*. Miscellaneous bryozoans continued to increase in cover and were recorded at 6.8%, the highest cover since 1996. *Diaperoecia californica* were common on the steep sides of rocks, but none were observed on RPCs this year. Overall, there was a noticeable increase in bryozoan cover similar to what we have observed at other sites this year.

Similar to the other two sites at this Island, *Strongylocentrotus purpuratus* density dramatically declined and was recorded at its lowest density (0.38/$m^2$) since monitoring began at his site in 1986. *Strongylocentrotus franciscanus* density was 4.92/$m^2$, similar to last year. Juvenile *S. purpuratus* and *S. franciscanus* were rare at this site. *Centrostephanus coronatus* density continued to decline for the second consecutive year and was recorded at 0.083/$m^2$, the lowest since 1997. No sea urchin wasting disease was observed at this site.

*Asterina miniata* density increased to 0.25/$m^2$, a relatively high density for this site. This increase is similar to what we have observed at many of the other sites this year. *Pisaster giganteus* were counted on both quadrats and 5-meter quadrats with densities of 0.25/$m^2$ and 0.075/$m^2$ respectively, and similar to recent years. No *Ophiothrix spiculata* were observed on RPCs this year. No sea star wasting disease was observed. *Parastichopus parvimensis* density was 0.62/$m^2$, similar to recent years, but the highest recorded density at this site.

*Lithopoma undosum* density continued to decline for the third consecutive year and was 0.042/$m^2$, the lowest density since 1997. *Cypraea spadicea* density was 0.21/$m^2$, which was the highest density recorded since this site was established in 1986. *Megathura crenulata* density was 0.0028/$m^2$. No live *Haliotis spp.* were observed this year. Similar to the other sites at this Island, *Aplysia californica* were relatively rare with a density of 0.0042/$m^2$, the lowest recorded since 1996. *Crassedoma giganteus* density was 0.0056/$m^2$, similar to previous years.

The most abundant fish at this site were small adult *Chromis punctipinnis*, adult *Oxyjulis californica*, and *Alloclinus holderi*. Adult *C. punctipinnis* were common with up to 259 counted. No juvenile *C. punctipinnis* were observed this year. Adult *Hypsypops rubicundus* were moderately abundant as usual with 15 observed. No juvenile *H. rubicundus* were observed. Several *H. rubicundus* that were at least 15cm were observed with one or two blue spots. Four small female, one small male, and one juvenile *Semicossyphus pulcher* were observed. Adult *Oxyjulis californica* were moderately abundant with up to

190 counted, and several juveniles were observed. Four female and two male *Halichoeres semicinctus* were observed. Adult *Medialuna californiensis* were common. *Oxylebius pictus* were common with 16 counted, but not as abundant as the other sites at this Island. One *Embiotoca jacksoni* was observed. One grass rockfish, *Sebastes rostratus*, and two adult *Sebastes atrovirens* were observed. One juvenile Cabezon*, Scorpaenichthys marmoratus*, was observed. *Coryphopterus nicholsii* were noticeably more abundant than in previous years, similar to what we have observed at other sites. Their density was 0.21/$m^2$, relatively high for this site and the highest density recorded since 1990. *Alloclinus holderi* were also noticeably more abundant than last year and had a density of 1.42/$m^2$, the highest recorded since 1999. Roving diver fish counts were conducted on July 9th with four divers observing 18 species of fish and on August 19th with four divers observing 17 species of fish.

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

David Kushner thinks we should place several extra eyebolts along the transect to facilitate its location and decrease lead line maintenance as a result of abrasion. In addition, a new eyebolt needs to be installed for the temperature logger. The current temperature logger eyebolt is unstable, but was temporarily repaired during this trip.

## Location: Northwest Harbor, San Clemente Island

2003 sampling dates: 5/28 and 5/30.
2003 status: Mature kelp forest, dense.

This site was installed on April 12-13 by Jim Marshall and David Kushner aboard the "Nada Mas". The thread rod and eyebolts were installed on April 12th and the lead line on the 13th. Similar to the other sites we have installed at this Island, the transect runs nearly due East – West with the East end being the zero meter end. As with all of the other sites on this island, all of the temperature loggers were deployed at the East/Zero end of the transect. The GPS coordinates for the transect and their approximate depths are listed below:

| Northwest Harbor | Latitude | | | Longitude | | | Depth (m) |
|---|---|---|---|---|---|---|---|
| East end | 33 | 02 | 278 | 118 | 35 | 688 | 9 |
| Middle | 33 | 02 | 281 | 118 | 35 | 724 | 10 |
| West end | 33 | 02 | 285 | 118 | 35 | 749 | 12 |

The Northwest Harbor site is in the North Island Eco-Region. The site was set up about ¼ mile west of Bird Rock and runs parallel to shore. The site was established along the inshore side of an expansive kelp forest. The bottom in this area consists of a mixture of bed rock with moderate relief (2 meters in some places) and large boulders with interspersed patches of sand. There also appears to be a fair amount of sand movement in the area. I mention this because when the transect was initially installed on April 12th, we estimated that about 25% of the bottom along the transect was sand, but there was hardly any sand during our sampling visit on May 28th. It was obvious that most of the sand had moved and was over bedrock. There was also a large increase in kelp cover over this period.

On May 28th, *Macrocystis pyrifera* canopy cover over the transect was estimated at 100% and was thick and healthy. The canopy was so thick it was difficult to maneuver the boat while live boating divers to locate the transect and anchoring. A large amount of *M. pyrifera* was ground up by the propellers and settled on the bottom making sampling more difficult and time consuming. Adult, subadult, and juvenile *M. pyrifera* were all common with densities of 0.36/$m^2$, 0.17/$m^2$, and 2.04/$m^2$ respectively and cover on the bottom was recorded at 18.7%. Understory algae were moderately abundant. Adult *Eisenia arborea* were common, but most of the adult plants appeared relatively old, and only a few juveniles were observed. Adult and juvenile *E. arborea* densities were 0.29/$m^2$ and 0.042/$m^2$ respectively and cover was

recorded at 0.5%. No adult and only a few juvenile *Pterygophora californica* were observed with a density of 0.13/$m^2$. No adult and only a few juvenile *Laminaria farlowii* were observed with a density of 0.25/$m^2$. No *P. californica* or *L. farlowii* were observed during RPCs. Several small *Cystoseira sp*. plants were observed with a cover of 0.5%. The brown alga, *Pachydictyon sp*. was common. Miscellaneous brown algae cover was recorded at 2.3%. Miscellaneous red algae were abundant and diverse covering 38.3% of the bottom. *Gelidium nudifrons* were moderately abundant and *Gelidium robustum* were common. *Gelidium spp*. covered 8.0% of the bottom. Encrusting and articulated coralline were common covering 15.0% and 22.7% of the bottom respectively. Bare substrate covered 19.2% of the bottom. The bottom along the transect consisted of 80.8% rock, 2.7% cobble and 16.5% sand.

The most common miscellaneous invertebrates on RPCs were hydroids. These consisted mostly of an *Obelia sp*. like hydroid. Miscellaneous invertebrates excluding *Ophiothrix spiculata* covered 24.7% of the bottom. *Membranipora* like bryozoans were common. Miscellaneous bryozoans covered 4.0% of the bottom. Very small colonies of *Diaperoecia californica* were present covering 0.17% of the bottom. *Balanophyllia elegans* were rare with only several observed, none on RPCs. *Astrangia lajollaensis* were common covering 2.3% of the bottom. *Corynactis californica* were rare with a cover of 0.5%, but this was the only site where we observed this species. Gorgonians were absent from this site with no *Lophogorgia chilensis* or any of the *Muricea spp*. that were observed at Eel Point. Sponges were common with a cover of 1.3%. The most common sponges were *Leucilla nuttingi, Hymenamphiastra cyanocrypta,* and *Leucosolenia eleanor*. *Tethya aurantia* were rare and none were observed on band transects. Tunicates were moderately abundant covering 11.3% of the bottom, and consisted mostly of *Didemnum sp*., *Distaplia*, *Aplidium spp*., and *Clavelina huntsmani*.

No *Asterina miniata* were observed. *Pisaster giganteus* were common and counted on both quadrats and 5-meter quadrats with densities of 0.042/$m^2$ and 0.065/$m^2$ respectively. Twenty eight were found for size frequencies and there was little size variation with a mean size of 100mm. The most abundant sea star at this site was *Linckia columbiae.*

*Strongylocentrotus franciscanus* were the most abundant sea urchin with a density of 1.46/$m^2$. Most of the *S. franciscanus* were in small crevices and we measured 181 for size frequencies. Nearly all were large with a mean size of 86mm and only one less than 50mm. *Strongylocentrotus purpuratus* density was 0.75/$m^2$. Most of the *S. purpuratus* were in crevices and we were able to locate 51 for size frequency measurements. Similar to *S. franciscanus* small individuals were rare with only one less than 30mm and a mean size of 49mm. We only observed one juvenile *S. purpuratus*. No *Centrostephanus coronatus* were observed.

*Haliotis corrugata* density was recorded at 0.0028/$m^2$. Only three *H. corrugata* were located for size frequency measurements, but there were at least two others along the transect. *Lithopoma undosum* density was 0.042/$m^2$ and only 10 located for size frequencies, but not much time was spent searching for them during size frequency measurements. Most were moderately large with a mean size of 85mm and only one small (39mm) one observed. *Kelletia kelletii* were common with a density of 0.018/$m^2$. Not much time was spent searching for these during size frequencies and only eight were measured. Most were large and the mean size was 128mm. *Megathura crenulata* were relatively uncommon with a density of 0.0028/$m^2$. *Serpulorbis squamigerus* were common covering 3.0% of the bottom. *Panulirus interruptus* were moderately abundant with a density of 0.060/$m^2$, the highest of all the sites at this Island. Most were small with few approaching legal size.

Fish were common but had the lowest diversity at this site relative to the other three sites. Small female and male *Semicossyphus pulcher* were the most abundant fish on the bottom and adult *Paralabrax clathratus* were the most abundant fish midwater and in the canopy. Similar to the other sites, very small male *S. pulcher* were common. Adult *Chromis punctipinnis* were relatively uncommon except for one large school that passed by the transect. Several adult and no juvenile *Hypsypops rubicundus* were observed. Several *Sebastes atrovirens* were observed, but none during the roving diver fish count. One painted greenling, *Oxylebius pictus*, was observed. Several female and at least one male *Halichoeres semicinctus* were observed. Adult *Oxyjulis californica* were common. *Coryphopterus nicholsii* were

common and had a density of 0.21/$m^2$. *Alloclinus holderi* were common with a density of 0.13/$m^2$, but were very difficult to see. The *A. holderi* at this Island seem to inhabit crevices more than at the Park Islands. Although these were common, none were observed during the roving diver fish count. At least one California Scorpion fish, *Scorpaena guttata* was observed. At least one Rainbow scorpion fish, *Scorpaenodes xyris*, was observed. One ocean whitefish, *Caulolatilus princeps*, was observed. Roving diver fish count was conducted on May 30th with six divers observing 10 species of fish.

## Location: Boy Scout Camp, San Clemente Island

**Site #18 CLBSC**
2003 sampling dates: 5/29 and 5/30.
2003 status: Mature kelp forest with a thick understory.

The thread rod, eyebolts and 50 meters of lead line for this site were installed during our May/June cruise in 2002. This was the first of the four proposed sites installed at San Clemente Island. Like the other sites at this Island, the transect runs nearly due East-West with the East end being the zero meter end. The temperature logger was installed on the East/zero end. The depth of the site is approximately 12.5 meters.

New GPS coordinates were not taken and the ones below were taken in 2002 and need to be confirmed:

| Boy Scout Camp | Latitude | | | Longitude | | | Depth (m) |
|---|---|---|---|---|---|---|---|
| East end | 33 | 00 | 148 | 118 | 32 | 935 | ~12.5 |
| Middle | 33 | 00 | 152 | 118 | 32 | 897 | |
| West end | 33 | 00 | 113 | 118 | 32 | 895 | ~12.5 |

The Boy Scout Camp site is within the East Shore Eco-Region. The site was established just off the main building at Boy Scout Camp and runs parallel to shore. The bottom in this area consists mostly of very large (often several meters in size) boulders with small patches of sand between. The east side of the Island drops off very rapidly and as a result there are not large expansive stands of *Macrocystis pyrifera*, but rather relatively narrow bands of *M. pyrifera* that parallel the coast.

It was difficult locating this site because only 50 meters of lead line were installed when the site was set up in 2002. When fish transects were conducted, 50 meters of the transect was off by about three meters, but this should have little effect on the fish data.

On May 30th, *M. pyrifera* canopy cover over the transect was estimated at 65% and was thick and healthy. This transect has the least amount of canopy cover of the four sites at this Island. This area of the Island is unique as it is well protected from swell and the water is calm most of the year, allowing for bay-like conditions. The most noticeable effect is that many of the brown macroalgae are larger than common. The blades of *M. pyrifera, Laminaria farlowii,* and *Agarum fimbriatum* are all the largest we have ever observed.

Adult and subadult *M. pyrifera* were common, while juveniles were abundant with densities of 0.12/$m^2$, 0.34/$m^2$, and 13.7/$m^2$ respectively, and cover on the bottom was recorded at 19.0%. Understory algae were abundant along the eastern 65 meters of the transect and much less abundant on the western 35 meters of the transect. This may in part be due to the low light along the later part of the transect due to a thick canopy cover. Adult and juvenile *Eisenia arborea* were common with densities of 0.13/$m^2$ and 0.25/$m^2$ respectively and covered 1.0% of the bottom. No *Pterygophora californica* were observed along the transect. Adult and juvenile *Laminaria farlowii* were common. No adults were observed on quadrats, juvenile density was recorded at 1.1/$m^2$, and cover was recorded at 9.3%. *Agarum fimbriatum* were common and we decided to add it as one of our indicator species. Adult and juvenile *A. fimbriatum* densities were 0.21/$m^2$ and 0.13/$m^2$ respectively. These algae were counted as other brown algae on

RPCs. A few small *Cystoseira setchellii* were observed along the transect, but none were observed during RPCs. Understory miscellaneous brown algae consisting mostly of *Dictyota sp., Pachydictyon sp., and A. fimbriatum* were abundant covering 48.2% of the bottom. Green algae were common and consisted mostly of *Chaetomorpha spiralis*, this category covered 8.0% of the bottom. Miscellaneous red algae were common covering 12.0% of the bottom. This category consisted mostly of *Rhodymenia californica*. No *Gelidium spp*. were present on RPCs. Articulated coralline algae were relatively rare compared to the other three sites at this Island and only covered 2.5% of the bottom. Encrusting coralline algae were abundant covering 40.2% of the bottom. Bare substrate cover was also high at 38.5%. The bottom along the transect consisted of 76.2% rock, 2.3% cobble and 21.5% sand.

The most common miscellaneous invertebrates on RPCs were gorgonians. Miscellaneous invertebrates excluding *Ophiothrix spiculata* covered 0.83% of the bottom. Miscellaneous bryozoans were common covering 5.7% of the bottom. No *Diaperoecia californica* were observed. No *Balanophyllia elegans* were observed and *Astrangia lajollaensis* covered 0.5% of the bottom. No *Corynactis californica* were observed. *Lophogorgia chilensis* and *Muricea fruticosa* were present but in low numbers and *M. californica* were common. Their densities were 0.0042/$m^2$, 0.0097/$m^2$, and 0.068/$m^2$ respectively. *Eugorgia rubens* were also common. Sponges were common covering 0.83% of the bottom. No *Tethya aurantia* were observed. Tunicates were common covering 8.8% of the bottom. The most common tunicate looked like a combination of *Clavelina huntsmani* and *Aplidium sp*. *Diopatra ornata* were common in the low lying sandy areas and covered 0.33% of the bottom.

No *Asterina miniata* were observed at this site. One small *A. miniata* was observed under a rock several hundred meters away during a survey dive. *Pisaster giganteus* were rare and counted on both quadrats and 5-meter quadrats with densities of 0.0/$m^2$ and 0.015/$m^2$ respectively. There were not enough sea stars for size frequency measurements. Similar to the other sites, the most abundant sea star at this site was *Linckia columbiae*, and this was common.

*Strongylocentrotus franciscanus* and *S. purpuratus* were noticeably less abundant than the other sites on this Island. Their densities were 0.33/$m^2$ and 0.25/$m^2$ respectively. Most were in crevices and only 74 *S. franciscanus* were located for size frequencies, and only *two S. purpuratus*. Similar to the other sites, the *S. franciscanus* were large with a mean size of 99mm and only one less than 50mm was found. *Centrostephanus coronatus* were more abundant at this site than the other three sites, and had a density of 0.42/$m^2$. Size frequencies for *C. coronatus* were conducted with 34 measured and a mean size of 64mm. None less than 35mm were observed indicating little recruitment similar to the other species.

*Haliotis corrugata* density was recorded at 0.011/$m^2$. Only three *H. corrugata* were measured for size frequencies. These ranged from 160-170mm, and all of the other *H. corrugata* observed were large and of similar size. *Lithopoma undosum* were rare with none observed on quadrats and only several observed at the site, these were large. *Kelletia kelletii* were rare with none observed on band transects and only several observed at the site. *Megathura crenulata* were absent from the site. *Serpulorbis squamigerus* were common covering 3.5% of the bottom. *Panulirus interruptus* were common with a density of 0.022/$m^2$. Most were small with few approaching legal size.

Fish were relatively diverse and abundant at this site. Similar to the other sites *Paralabrax clathratus* and *Semicossyphus pulcher* were the most abundant fish. Small female and male *S. pulcher* were moderately abundant. Similar to the other sites, very small males were common. Juvenile *S. pulcher* were also common with several observed, more than at the other sites. Adult *Chromis semicinctus* were common. Kelp surfperch, *Brachyistius frenatus*, were abundant in the kelp canopy. Medium size adult and smaller adult (just at about 10cm) *Sebastes atrovirens* were surprisingly common. One adult and one juvenile *Sebastes serriceps* were observed. Two *Sebastes serranoides* were observed. Adult *Hypsypops rubicundus* were common and one juvenile was observed during roving diver fish count. This juvenile was large and probably two years old. Adult *Oxyjulis californica* were common. Several male and female *Halichoeres semicinctus* were observed. One *Girella nigricans* was observed. *Lythrypnus dalli* were common with a density of 0.21/$m^2$, this was the only site at this Island where we observed this species. *Coryphopterus nicholsii* were relatively abundant with a density of 2.63/$m^2$, the highest density

of all the sites at this Island. *Alloclinus holderi* were rare with a density of 0.083/$m^2$. Roving diver fish count was conducted on May 29th with six divers observing 18 species of fish.

One giant black sea bass, *Stereolepis gigas*, was observed on May 30th. This fish was estimated (a best guess) at 250lbs and it was very curious. It checked out all of the divers during our first two dives and then disappeared. We believe this is the same fish that was observed at this site in 2002. Several days later during a survey dive about 400 meters to the East we observed the same fish for about 30 minutes and then briefly a smaller *S. gigas*. During the latter encounter, the large fish just circled two of the divers (David Kushner and John Conti) for thirty minutes, and came within two feet on several occasions.

Note: Dan Richards was unavailable to dive and conduct the fish transects, so Laura Rogers-Bennett did the fish transects from the vessel Mako. Although Laura is not specifically trained in this technique it appeared she conducted an adequate count. Laura was not instructed to swim a pace of 2.5 min per 50 meter transect and swam much slower which may have resulted in an overestimation of fish abundance. However, we feel her data were adequate and have decided it can be utilized.

## Location: Eel Point, San Clemente Island

**Site #19 CLEP**
2003 sampling dates: 5/28, 5/29.
2003 status: Mature kelp forest with patches of high density subadults.

This site was installed on April 13 by Jim Marshall and David Kushner aboard the "Nada Mas". The thread rod, eyebolts and lead line were installed on April 13th. Similar to the other sites we have installed at this Island, the transect runs nearly due East – West with the East end being the zero meter end. As with all of the other sites on this island, all of the temperature loggers were deployed at the East/Zero end of the transect. We completed the entire installation of this transect in about six hours of bottom time. The GPS coordinates for the transect and their approximate depths are listed below:

| Eel Point | Latitude | | | Longitude | | | Depth (m) |
|---|---|---|---|---|---|---|---|
| East end | 32 | 54 | 922 | 118 | 32 | 669 | 10.5 |
| Middle | 32 | 54 | 923 | 118 | 32 | 699 | 11 |
| West end | 32 | 54 | 931 | 118 | 32 | 735 | 13.5 |

The Eel Point site is within the West Shore Eco-Region. This region tends to be characterized as having a wide shelf of mostly bedrock with expansive kelp forests. This site was established just south of Eel Point and parallels the shoreline out to the point. The site was established at nearly the same location where the Habitat mapping/transect was conducted in 2002. The bottom in this area consists mostly of bedrock with moderate relief of up to about 2.5 meters. Patches of sand are also common in the area.

On May 29th, *Macrocystis pyrifera* canopy cover over the transect was estimated at 100% and was thick and healthy. There was noticeably more canopy cover on this date than six weeks earlier on May 13th when the site was established. Adult *M. pyrifera* were common, while subadult and juveniles were more abundant with densities of 0.085/$m^2$, 1.56/$m^2$, and 8.9/$m^2$ respectively, and cover on the bottom was recorded at 30.0%. Understory algae were abundant and consisted mostly of *Laminaria farlowii* and miscellaneous red algae. Adult and juvenile *Eisenia arborea* were common with densities of 0.17/$m^2$ and 0.083/$m^2$ respectively and cover was recorded at 0.67%. *Pterygophora californica* were rare with only several small plants observed, but none were present on quadrats or RPCs. *Laminaria farlowii* were the most abundant understory macroalgae and most of these plants were either small adults or large juveniles. Adult and juvenile *P. californica* densities were 1.71/$m^2$ and 5.77/$m^2$ respectively, and cover was recorded at 12.8%. *Cystoseira setchellii* were common with a cover of 1.7%. *Pachydictyon sp*. were the most common miscellaneous brown algae. Miscellaneous brown algae covered 12.0% of the bottom. *Gelidium nudifrons* were common and there were some *G. robustum* present. *Gelidium spp*. covered

3.0% of the bottom. Articulated and encrusting coralline algae were moderately abundant with covers of 39.3% and 35.0% respectively. Bare substrate covered 11.7% of the bottom. The bottom along the transect consisted of 79.8% rock, 6.0% cobble and 14.2% sand.

There were few miscellaneous invertebrates on RPCs and the most common were Christmas tree worms, *Spirobranchus spinosus*. Miscellaneous invertebrates excluding *Ophiothrix spiculata* covered 1.0% of the bottom. Miscellaneous bryozoans were common covering 4.7% of the bottom. No *Diaperoecia californica* were observed. *Balanophyllia elegans* and *Astrangia lajollaensis* were present covering 0.5% and 0.17% of the bottom. No *Corynactis californica* were observed. Gorgonians were absent from this site with no *Lophogorgia chilensis* or any of the *Muricea spp*. observed similar to Northwest Harbor. Sponges were common and diverse covering 1.0%. No *Tethya aurantia* were observed. Tunicates were common covering 5.7% of the bottom, and consisted mostly of *Didemnum/Tridemnum*. *Diopatra ornata* covered 1.0% of the bottom.

No *Asterina miniata* were observed. *Pisaster giganteus* were common and counted on both quadrats and 5-meter quadrats with densities of 0.042/$m^2$ and 0.01/$m^2$ respectively. "Double sampling" (please see note below) for size frequencies of this species was conducted with a total of 27 found. There was little size variation with a mean size of 92mm. The most abundant sea star at this site was Linckia columbiae, but it was not as abundant as it was at Northwest Harbor.

*Strongylocentrotus franciscanus* and *S. purpuratus* were common with densities of 1.29/$m^2$ and 2.0/$m^2$, respectively. Most of the *S. franciscanus* were in small crevices and a total of 278 were measured for size frequencies, however "double sampling" occurred for this species (please see note below). Nearly all were large with a mean size of 88mm and none less than 50mm, similar to the other sites. Similarly, most of the *S. purpuratus* were in crevices and we were able to locate 160 for size frequency measurements. "Double sampling" also occurred for this species (see note below), and the mean size was 43 and small individuals were rare with 16 less than 30mm and only one less than 20mm. However, this represents an increase in smaller individuals found here than at the other sites. *Centrostephanus coronatus* were rare with only several observed.

*Haliotis corrugata* density was recorded at 0.0056/$m^2$. Five *H. corrugata* were located for size frequency measurements along the transect. The *H. corrugata* at this site were noticeably smaller than at the other three sites. Here they had a mean size of 118mm with the smallest at 76mm and the largest at 138mm. *Lithopoma undosum* were common with a density of 0.13/$m^2$, higher than the other three sites. All of the *L. undosum* were large with a mean size of 89mm and the smallest was 64mm. We inadvertently conducted duplicate size frequency sampling for this species (see note below). *Kelletia kelletii* were moderately abundant with a density of 0.057/$m^2$. We inadvertently conducted duplicate size frequency sampling for this species (see notes below). Most of the *K. kelletii* were large with a mean size of 109mm. *Megathura crenulata* were common with a density of 0.015/$m^2$, and a mean size of 99mm for the 14 individuals measured. *Serpulorbis squamigerus* were common covering 4.3% of the bottom. *Panulirus interruptus* were relatively uncommon compared to the other sites and had a density of 0.0042/$m^2$. Most were small with a few approaching legal size.

Fish were abundant and had low diversity. Similar to the other sites, the most abundant fish were *Paralabrax clathratus* and *Semicossyphus pulcher.* Adult *Paralabrax clathratus* were abundant and present in all sizes, including several large (3kg) fish. No juveniles were observed. Male and female *Semicossyphus pulcher* were abundant and most were small, but several males were observed that may have been 5kg. Adult *Oxyjulis californica* were common. One or two male and female *Halichoeres semicinctus* were observed, but they were rare. Several adult *Hypsypops rubicundus* were observed. Several adult *Sebastes atrovirens* were observed, but they were rare. One adult *Sebastes serriceps* was observed. Several adult *Sebastes serranoides* were observed, but they were relatively uncommon. Several *Oxylebius pictus* were observed. No *Coryphopterus nicholsii* were observed. Several *Alloclinus holderi* were observed, but these were rare, and none were observed during the roving diver fish count. No fish were observed on quadrats. Roving diver fish count was conducted on May 28th with six divers observing 14 species of fish.

Note: Due to two groups of divers conducting sampling from different vessels on different days, we inadvertently conducted several "duplicate" size frequency samples at Eel Point. Instead of just taking the highest sample size for each species, we decided to utilize all of the data. The problem with this is that it is possible that some of the animals measured for size frequency measurements were the same animals measured by each of the two diver groups, that is they were sampled twice. It is likely that this occurred, but it is doubtful that a large proportion of the animals were measured more than once which is why we decided to keep all of the data. Furthermore, the data can be compared to see the differences between the two groups of divers. If there are differences, this could be attributed to sampling error caused by biases of the observers. Below is a table of the two groups of divers and the sample size, mean size, minimum size, and maximum size of the species that were sampled twice. Note, there is very little difference in all cases. Also note, we are sure that the *Haliotis corrugata* measured at this site by the two groups are different abalone even though two of them measured the same size.

| Diver Group: | Date: | Species | Sample Size | Mean Size mm | Minimum size mm | Maximum size mm |
|---|---|---|---|---|---|---|
| "Mako" | 5/28/03 | *Haliotis corrugata* | 3 | 130 | 124 | 138 |
| "Pacific Ranger" | 5/29/03 | *Haliotis corrugata* | 2 | 100 | 76 | 124 |
| "Mako" | 5/28/03 | *Kelletia kelletii* | 72 | 109 | 91 | 125 |
| "Pacific Ranger" | 5/29/03 | *Kelletia kelletii* | 28 | 110 | 82 | 129 |
| "Mako" | 5/28/03 | *Lithopoma undosum* | 27 | 89 | 64 | 125 |
| "Pacific Ranger" | 5/29/03 | *Lithopoma undosum* | 26 | 88 | 76 | 106 |
| "Mako" | 5/28/03 | *Pisaster giganteus* | 18 | 93 | 78 | 123 |
| "Pacific Ranger" | 5/29/03 | *Pisaster giganteus* | 9 | 91 | 76 | 110 |
| "Mako" | 5/28/03 | *Strongylocentrotus franciscanus* | 145 | 90 | 55 | 132 |
| "Pacific Ranger" | 5/29/03 | *Strongylocentrotus franciscanus* | 133 | 86 | 62 | 118 |
| "Mako" | 5/28/03 | *Strongylocentrotus purpuratus* | 67 | 42 | 16 | 82 |
| "Pacific Ranger" | 5/29/03 | *Strongylocentrotus purpuratus* | 93 | 43 | 22 | 70 |

## Location: Horse Beach Cove, San Clemente Island

**Site #20 CLHBC**
2003 sampling dates: 5/31, 6/1.
2003 status: Mature kelp forest with patches of high density subadults.

This site was located and installed on May 31st. Thread rod, eyebolts and about 80 meters of the lead line were deployed on this day. Similar to the other sites we have installed at this Island, the transect runs nearly due East – West with the East end being the zero meter end. As with all of the other sites on this island, the temperature logger was deployed at the East/Zero end of the transect. The depth of most of the transect was approximately 14 meters. The GPS coordinates for the transect and approximate depths are listed below:

| Horse Beach Cove | Latitude | | | Longitude | | | Depth (m) |
|---|---|---|---|---|---|---|---|
| East end | 32 | 48 | 516 | 118 | 24 | 454 | 13 |
| Middle | 32 | 48 | 522 | 118 | 24 | 485 | 12 |
| West end | 32 | 48 | 527 | 118 | 24 | 513 | 12.5 |

The Horse Beach Cove site is within the Pyramid Eco-Region. This site was established east of Horse Beach Cove and the transect runs parallel to the shore. The site was established about ¼ mile east of where habitat mapping/transects were conducted in 2002. The bottom type is similar in both areas and consists of both bedrock and boulders. Relief was lower than the other sites and was rarely more than 1 meter.

On May 31st, *Macrocystis pyrifera* canopy cover over the transect was estimated at 95% and was thick and healthy. Though the canopy was thick over the entire transect it was especially thick over the western half. The eastern half of the transect was closer to the edge of the reef, allowing much more light onto the bottom. Correspondingly, understory algae was much more abundant along this half of the transect.

Adult and subadult *M. pyrifera* were common, while juveniles were abundant with densities of 0.19/$m^2$, 0.59/$m^2$, and 12.2/$m^2$ respectively, and cover on the bottom was recorded at 14.3%. As mentioned above, understory algae were most abundant along the eastern half of the transect and was diverse. Adult and juvenile *Eisenia arborea* were common with densities of 0.25/$m^2$ and 0.28/$m^2$ respectively, and a cover of 3.7%. No *Pterygophora californica* were observed. Small adult and juvenile *Laminaria farlowii* were common with densities of 0.29/$m^2$ and 0.88/$m^2$ respectively. *Cystoseira spp*. were common covering 7.3% of the bottom. *Pachydictyon spp*. were the most common miscellaneous brown algae. This category covered 16.0% of the bottom. *Gelidium nudifrons* were common along the eastern half of the transect. *Gelidium spp*. covered 1.7% of the bottom. Miscellaneous red algae cover was recorded at 12.8%. Articulated and encrusting algae were common covering 9.5% and 18.3% of the bottom respectively. Bare substrate covered 34.5% of the bottom. The bottom along the transect consisted of 69.3% rock, 10.0% cobble and 20.7% sand.

The most common miscellaneous invertebrates on RPCs were hydroids and spirorbids. Miscellaneous invertebrates ,excluding *Ophiothrix spiculata*, covered 12.7% of the bottom. Miscellaneous bryozoans were relatively abundant covering 11.3% of the bottom and consisted mostly of *Membranipora spp*.. *Diaperoecia californica* covered 2.0% of the bottom. *Astrangia lajollaensis* were rare and no *Balanophyllia elegans* were observed. Neither was observed on RPCs. No *Corynactis californica* were observed. *Lophogorgia chilensis* and *Muricea fruticosa* were rare and *M. californica* were common. Their densities were 0.0/$m^2$, 0.0028/$m^2$, and 0.047/$m^2$ respectively. Sponges were common and diverse covering 1.83%. This site had the highest density of *Tethya aurantia* of all of the sites and was recorded at 0.0028/$m^2$. Tunicates were abundant covering 8.3% of the bottom. The most common were *Aplidium spp*. *Metandrocarpa taylori*, and *Didemnum spp*. *Diopatra ornata* covered 2.2% of the bottom.

No *Asterina miniata* were observed. *Pisaster giganteus* were rare and counted on both quadrats and 5-meter quadrats with densities of 0.0/$m^2$ and 0.005/$m^2$ respectively. Only seven were found for size frequencies and there was little size variation with a mean size of 106mm. The most abundant sea star at this site was *Linckia columbiae*, but they were not as abundant as at the other San Clemente sites.

*Strongylocentrotus franciscanus* were the most abundant sea urchin with a density of 1.13/$m^2$. Most of the *S. franciscanus* were in small crevices and we measured 127 for size frequencies. Similar to the other sites they were large with a mean size of 88mm and none were less than 50mm. *Strongylocentrotus purpuratus* density was 0.25/$m^2$. Most of the *S. purpuratus* were in crevices and we were only able to locate 12 for size frequency measurements. Similar to *S. franciscanus* small individuals were rare with none less than 35mm and a mean size of 51mm. *Centrostephanus coronatus* were rare, and had a density of 0.042/$m^2$.

*Haliotis corrugata* were relatively common at this site with a density of 0.0097/$m^2$. We conducted a good search around the transect for size frequencies and 13 *H. corrugata* were measured. There was a wide range of sizes indicating a healthier population than elsewhere. The smallest and largest *H. corrugata* found were 59mm and 186mm respectively and the mean size was 142mm. *Lithopoma undosum* density was 0.042/$m^2$ and only 19 located for size frequencies. Similar to the other sites all were large with a mean size of 89mm and none were less than 60mm. *Kelletia kelletii* density was 0.011/$m^2$. Eleven were

found for size frequency measurements and all were large with a mean size of 128mm. *Megathura crenulata* density was 0.0097/$m^2$. Six were located for size frequencies and all were large. *Serpulorbis squamigerus* were often found in large colonies and were abundant covering 8.5% of the bottom. This is the highest coverage of all the four sites on this Island. *Panulirus interruptus* were common with a density of 0.028/$m^2$. Most were small with few approaching legal size.

Fish were moderately abundant and diverse. On the roving diver fish count we recorded the highest diversity of all the sites at this Island. The most abundant fish were adult *Paralabrax clathratus*. Most of these were in the kelp canopy and rarely observed on the bottom. All sizes of adults were present, but most were small and no juveniles were observed. Adult *Chromis punctipinnis* were common. Small male and female *Semicossyphus pulcher* were abundant and several medium sized males were observed. Several male and female *Halichoeres semicinctus* were observed. Adult *Oxyjulis californica* were common. This was the only site where we observed surfperch other than *Brachyistius frenatus*. Several adult and juvenile *Embiotoca jacksoni* and several adult rubberlip surfperch, *Rhacochilus toxotes*, were observed. *Brachyistius frenatus* were common in the kelp canopy. Adult *Hypsypops rubicundus* were common and one juvenile was observed. Several *Girella nigricans* were observed. Painted greenlings, *Oxylebius pictus*, were uncommon. One adult and one juvenile *Sebastes serriceps* were observed. Small adult *Sebastes atrovirens* were common and several juveniles were observed. Several adult *Sebastes serranoides* were observed. *Coryphopterus nicholsii* density was 0.21/$m^2$. *Alloclinus holderi* density was 0.33/$m^2$. Roving diver fish count was conducted on June 1$^{st}$ with seven divers observing 21 species of fish.

## Survey Dives:

### Location: Inshore of Gull Island

2003 Sampling dates: 7/24
2003 status: Mature kelp forest
N 33 57.142
W 119 49.138

A brief 30 minute survey dive was conducted midway between Gull Island and Santa Cruz Island at a depth of about 7-13 meters. The area was a rocky bottom with small sand patches between the rocks and reefs that had up to 5 meters of relief. Most of the area consisted of mature kelp forest with large widely spaced *Macrocystis pyrifera* plants and a thin understory. Some *Eisenia* were present in the shallower areas of the reefs. There was a notable abundance of large *Strongylocentrotus franciscanus*, many of which appeared to be commercially legal size, though no size frequencies were conducted. Emergent *S. purpuratus* were rare, but small ones were common under rocks. Male and female *Semicossyphus pulcher* of moderately large size were relatively abundant. Surf perches were also moderately abundant. Encrusting invertebrates were abundant with the most noticeable being various tunicates (*Aplidium* spp., *Cystodytes*, etc.), sponges, and amphipod tube mats.

### Location: Inside of the surf break at Rodes Reef, Santa Rosa Island

2003 sampling dates: 8/21.
2003 status: Developing kelp forest.

A brief survey dive was conducted by several divers just inside of the surf break at Rodes Reef. Most of the dive was conducted above 10m. At depth greater than about 5 m, small subadult *Macrocystis pyrifera* plants were abundant. In the shallower areas, where most of the dive was conducted, there was an abundance of invertebrates. These ranged from high *Mytilus sp*. cover in the shallow areas to *Eudistylia polymorpha* and *Anthopleura sp*. This was a short dive and not many notes were taken.

## Location: Wilson Rock, San Miguel Island

2003 sampling dates: 9/11
2003 status: Rocky reef with numerous encrusting invertebrates.
34 06.423
128 24.223

A brief survey dive was conducted here between Wilson rock and the area that breaks further offshore of it. Neither Dan nor I made the dive and no notes were taken so no write-up will be conducted. The weather was excellent and there were several people that wanted to make a dive here.

## Location: Pelagophycus porra forest off Yellowbanks, Santa Cruz Island

2003 sampling dates: 9/26.
2003 status: *Pelagophycus porra* forest.
N 33 59.772
W 119 31.594

A brief survey dive was conducted.

# DISCUSSION

In this section we attempt to summarize some general trends and describe the status of some species encompassing more than one site. However, these are only general trends, a complete trend analysis for each of the indicator species is beyond the scope of this annual report. We hope that this section will be a catalyst for further investigation and analysis.

**General Biology:**
In 2003, mature *Macrocystis pyrifera* (giant kelp) forests were present at five of the 16 original kelp forest monitoring sites. In addition, five sites had developing kelp forest, four sites were dominated by echinoderms, and two sites were a mix with about half the site being a kelp forest and half dominated by echinoderms. Overall, there was notably more *M. pyrifera* at sites than in 2002. The mature kelp forests were present at Wyckoff Ledge and Hare Rock at San Miguel Island, Johnson's Lee North and Johnson's Lee South at Santa Rosa Island, and Gull Island South at Santa Cruz Island. Developing kelp forests were present at Rodes Reef, Santa Rosa Island, Yellow Banks at Santa Cruz Island, Landing Cove at Anacapa Island, Arch Point and Cat Canyon at Santa Barbara Island. The two sites that had kelp forest over about half of their transects were Cathedral Cove at Anacapa Island and Southeast Sea Lion Rookery at Santa Barbara Island. Pelican Bay and Scorpion Anchorage at Santa Cruz Island were dominated by *Strongylocentrotus purpuratus*. Admiral's Reef at Anacapa Island was dominated by *S. purpuratus* and *Strongylocentrotus franciscanus*. Fry's Harbor at Santa Cruz Island was dominated by *Pachythyone rubra* and *Ophiothrix spiculata*. In addition to the 16 original KFM sites, the newly established site, 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.

All three monitoring sites at Santa Barbara Island have incurred noticeable change since 2002. Many of the indicator species at all three sites are at or near their 22 year abundance highs or lows with much of this change being unprecedented since the monitoring program began in 1982. Overall, *Strongylocentrotus purpuratus* densities dramatically declined and this appears to be the driving force of much of the recent change at these sites. At Southeast Sea Lion Rookery, *S. purpuratus* continued to decline and was near zero, while *Strongylocentrotus franciscanus* increased a little. However, overall densities of *Strongylocentrotus spp*. were near their lowest for this site and a developing kelp forest was present over half the site this year. The remainder of this site continues to be dominated by *Ophiothrix spiculata*. At Arch Point, *S. franciscanus* increased some, however *S. purpuratus* dramatically decreased to their lowest density since monitoring began. Arch Point was a developing kelp forest this year. Similarly, Cat Canyon densities of *S. franciscanus* remained about the same while *S. purpuratus* declined to the lowest density recorded at this site and this site also had a developing kelp forest. Similar to the past several years, this Island remains mostly devoid of canopy forming kelp forests and substantial kelp forests were only present in a few small areas around Sutil Island and close to shore in shallow areas predominately on the west side of the island.

The three KFM sites at Anacapa Island appear to represent the Island well and have changed little from last year, unlike many of the other kelp forest monitoring sites. *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* densities declined at Admiral's Reef while they remained the same at Cathedral Cove and Landing Cove. Algal cover remained about the same at all three sites. As the densities of *Strongylocentrotus spp*. decline at Admirals Reef this site is more dominated by *Ophiothrix spiculata* and continues to have a low abundance of algae. Landing Cove was a developing kelp forest with high density patches of subadult kelps. Similar to recent years, *S. purpuratus* and *O. spiculata* dominate much of the south side of East Anacapa, and both the south and north sides of middle and West Anacapa Island. Similar to Santa Barbara Island, with the exception of the ecological reserve and other small patches of kelp forest scattered in shallow/near shore areas, much of Anacapa continues to be dominated by echinoderms, though they have decreased some in recent years.

Overall, the monitoring sites at Santa Cruz Island continued the trends experienced in 2002. Declining densities in *Strongylocentrotus spp*. continued and appear to be a major factor in these changes.

*Strongylocentrotus purpuratus* densities declined at four sites and remained the same at one, a continuation of the trends observed in 2002. *Strongylocentrotus franciscanus* densities declined at one site and remained the same at four. In 2003, three of the five sites at this Island were dominated by echinoderms, similar to 2002. Gull Island South has experienced rapid change over the past several years with the decline of *Strongylocentrotus spp*. and is now a mature kelp forest. Yellow Banks is clearly on the path of recovery with the status of developing kelp forest. Overall, echinoderms continue to decline at this Island and kelp forests are increasing with notably more kelp around the entire Island this year. We continue to feel that the five monitoring sites well represent the transitions going on at Santa Cruz Island. The western third of the Island is under represented by our monitoring program as we don't have any sites there. However, there appears to be a similar trend of increasing kelp forests as can be observed from an even denser canopy than was observed last year.

Kelp forests continued to be relatively abundant and continued to increase in abundance and denseness around Santa Rosa and San Miguel Islands. In 2003 mature kelp forests were present at four of the five monitoring sites and one was a developing kelp forest. In 2002, three sites had kelp forests. *Strongylocentrotus spp*. densities remained relatively low and overall continued to decline. *Strongylocentrotus purpuratus* densities declined at two sites and remained the about the same at the other three. *Strongylocentrotus franciscanus* densities declined at two sites, increased at one site and remained about the same at two sites. *Pycnopodia helianthoides* remain relatively abundant and they continue to prey upon *Strongylocentrotus spp*. as noted by whole sea urchin tests and are probably the main cause of decline at San Miguel and Santa Rosa Islands. The new monitoring site at San Miguel Island, Miracle Mile remained a mature kelp forest.

2003 was the first year we monitored the four newly established kelp forest monitoring sites at San Clemente Island as part of an agreement with the U.S. Navy. Mature kelp forests encompassed the entire Island where there was appropriate substrate and were present at all four of the monitoring sites. There are many notable differences at the sites on this Island compared to the regularly monitored 16 kelp forest monitoring sites at the northern Channel Islands. Overall, *Strongylocentrotus spp*. densities are lower than at the northern Channel Islands and it was often difficult to find the 200 sea urchins for size frequency measurements. In general, there were few small *Strongylocentrotus spp*. and lack of size cohorts observed at the northern Channel Islands. In addition, there was a higher proportion of legal sized (>83mm) *Strongylocentrotus franciscanus* than at the other Islands. In general, *Asterina miniata*, *Pisaster giganteus* and *Pycnopodia helianthoides* were all noticeably less abundant and had few size cohorts indicating sporadic recruitment. *Crassedoma giganteus* were notably less abundant and *Serpulorbis squamigerus* were noticeably more abundant than at the Northern Islands. *Haliotis corrugata* were noticeably more abundant than the northern Channel Islands and present at all four of the monitoring sites. *Panulirus interruptus* were noticeably more abundant, but appeared smaller than at the northern Channel Islands. The fish populations at this Island were noticeably less diverse than the northern Islands and the majority of the fish consist of warmer water species such as *Paralabrax clathratus* and *Semicossyphus pulcher*.

In 2003 there was a noticeable overall increase in algae cover. Filamentous diatoms were noticeably less abundant at most of the sites this year.

In 2003 sea urchin densities continued to decline overall for the third consecutive year. Notably, there were few increases and many decreases in sea urchin densities at the monitoring sites this year. *Strongylocentrotus purpuratus* densities decreased at nine sites and remained the same at seven sites, similar to 2002. *Strongylocentrotus franciscanus* was the only sea urchin species that increased at any of the sites this year. *Strongylocentrotus franciscanus* densities increased at two sites, decreased at five sites and remained about the same at ten sites. *Lytechinus anamesus* density declined at Yellow Banks and remained about the same at 15 sites. *Centrostephanus coronatus* are mostly present at Santa Barbara, Anacapa and the east end of Santa Cruz Islands. At the sites where they were present they remained at low densities or declined slightly.

Overall, in 2003 *Strongylocentrotus purpuratus* and *Strongylocentrotus franciscanus* recruitment remained low for the third consecutive year. There was no noticeable recruitment of *Centrostephanus coronatus* in 2003 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 recruitment event we observed for this warm water species was during the 1997/1998 El Niño and several years following this species have been in gradual decline.

Sea urchin wasting disease (Lafferty and Kushner, 1999, and Richards and Kushner, 1992) was noticeably less prevalent in 2003 compared to recent years. The disease was observed at two sites, a notable decline from the 8 sites in 2002. The disease was only observed at Santa Cruz Island this year. The disease was observed in *Strongylocentrotus purpuratus* at Fry's Harbor and in *Lytechinus anamesus* at Pelican Bay.

*Pycnopodia helianthoides* density remained similar to last year or declined at all of the sites from Gull Island at Santa Cruz Island and north/west. However, densities remain relatively high at all of these sites similar to the past several years. At the sites south/east of Gull Island the densities were either near zero (typical for these sites) or increased from 2002. The most dramatic increase occurred at Fry's Harbor and we expect this increase to have cascading effects at this site in the near future. Overall, *P. helianthoides* increased at three sites, decreased at four sites and remained the same at nine sites, similar to 2002. *Pycnopodia helianthoides* continues to appear as the controlling factor in sea urchin populations at the northern Channel Islands as whole sea urchin tests were common where they were abundant and an indictor of predation by this sea star.

*Asterina miniata* densities continued to increase overall with increased at eight sites and little or no change at the remaining eight sites. *Pisaster giganteus* density remained about the same as last year with increases at three sites, decreases at three sites and little or no change at the remaining 10 sites. The prevalence of sea star wasting disease increased this year, but remained low. Sea star wasting disease was observed at two sites, but intensity was low with only a few individual sea stars being affected. The disease was observed in *A. miniata* at Pelican bay and Scorpion's Anchorage, and in one *Pycnopodia helianthoides* at Scorpions Anchorage.

Over the past decade, *Ophiothrix spiculata* has increased in abundance and has become a significant biological feature at the Channel Islands. As a result, in 2003 we officially added this species as one of our kelp forest monitoring indicator species that will be monitored using the random point contact protocol. For the past three years (beginning in 2000) we have kept track of the percent cover of this species using this protocol the sites where it was noticeably abundant. We have not yet decided to include this information in the database since only several sites were monitored and there is difficulties managing null data in the database.

In 2003, there was a noticeable decline in *Ophiothrix spiculata*. Cover of *O. spiculata* declined at all five sites where they were common and counted in 2002. These five sites are Rodes Reef, Fry's Harbor, Yellow Banks, Admiral's Reef and Southeast Sea Lion, and they were rare or absent at the remaining 11 sites and all of these sites had a cover of 0.0%. At the fives sites where cover declined they notably dominated the bottom at three of them (Fry's Harbor, Admiral's Reef and Southeast Sea Lion) in 2003, the remaining two sites had a cover that was at or near zero.

The overall abundance of *Corynactis californica* at the monitoring sites continued to decline for the second consecutive year. Their cover declined or remained about the same at all sites this year except at Johnson's Lee South where they increased. This pattern we have observed post the 1997/1998 El Niño is similar to what we observed several years after the 1982/3 El Niño event.

Miscellaneous bryozoans continued to increase at most of the monitoring sites this year, similar to last year. They increased at 11 sites, decreased at one site and remained about the same at four sites. Overall, *Diaperoecia californica* continued to increase at five sites and remained the same at 11 sites.

The sponge, *Leucetta losangelensis* was noticeably more abundant than it has been in recent years and possibly more abundant than I remember since 1982/1983 and may suggest a regime change. This species was one of the original indicator species on RPCs in 1982, but was removed in 1984.

*Lithopoma undosum* densities continued their rapid decline for the third consecutive year. Similar to last year, their densities declined at eight sites and changed little or remained about the same at the remaining eight sites. This downward trend continues a pattern we have been observing in this species of increasing abundance post large El Niño events (1982/1983 and 1997/1998) and then a subsequent decrease.

*Megathura crenulata* and *Crassedoma giganteum* appear to be on a downward trend overall, decreasing at more sites than they are increasing.

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 currently 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* was the highest recorded since monitoring began at this site in 1983. At Miracle Mile, the density of *H. rufescens* remained high, but declined from 2002. A decline is not surprising since this site was specifically set up in an area that had an unusually high density of *H. rufescens* (Marshall, 2002). *Haliotis rufescens* recruitment at the 16 kelp forest monitoring sites remained low with eight juveniles (<51mm) observed in the ARMs. Though this appears low, it is the highest number recorded since 1994. An additional five juvenile *H. rufescens* were observed in the six ARMs at the Miracle Mile site at San Miguel Island.

Similar to recent years, *Haliotis corrugata* continue to be extremely rare at all of five of the Park Islands and there was little indication of recruitment in 2003. The only *H. corrugata* observed at the monitoring sites observed this year were several at Landing Cove, Anacapa Island. One juvenile (<51mm) *H. corrugata* was observed in the ARMs similar to 2002. We began monitoring four sites at San Clemente Island this year and there is notably more *H. corrugata* at this Island than at the northern Channel Islands. Densities at the four sites there ranged from $0.0014/m^2$ to $0.011/m^2$.

*Haliotis fulgens* sightings continue to be rare and none were observed at the monitoring sites this year.

No *Haliotis sorenseni* were observed this year. *Haliotis assimilis* continued to be relatively common in the ARMs with eight observed at two sites (Yellow Banks and Gull Island at Santa Cruz Island) this year, two more than in 2002. They ranged in size from 29-70mm, indicating that they are from more than one recruitment event. However, they were noticeably larger than last year indicating no recent recruitment.

There were no noticeable changes in adult fish populations at the monitoring sites since last year and as a result most of the comments in this discussion are with regards to juvenile fish. Most of the information below has been garnered from the roving diver fish counts. Overall, juvenile *Sebastes spp*. were common, similar to last year. Juvenile *Sebastes mystinus* were observed at 12 sites, similar to 2002. *Sebastes serranoides/flavidus juveniles* were common and were observed at 12 sites, similar to last year. Juvenile vermillion rockfish, *Sebastes miniatus* were rare and observed at only one site during the roving diver fish counts, similar to the past three years. Juvenile *Sebastes atrovirens* were noticeably more common than last year and observed at 12 sites, compared to four in 2002 during the roving diver fish counts. Juvenile bocaccio, *Sebastes paucispinis* were noticeably more abundant than the past three years and they were observed at six sites during the roving diver fish counts, none were observed in 2001 and 2002. Juvenile *Sebastes serriceps* were noticeably more abundant than the past several years. This year they were observed at 15 of the 16 regular KFM sites during the roving diver fish counts. The number of observations and abundance of juvenile *Chromis punctipinnis* remained low for the

second year. Juveniles were observed at three sites, less than in 2002. Juvenile *Hypsypops rubicundus* continued to be rare and only observed at one site, similar to last year. No juvenile *Paralabrax clathratus* were observed this year. Juvenile *Semicossyphus pulcher* were relatively common and observed at five sites, similar to last year. Juvenile *Oxyjulis californica* were observed at five sites, similar to last year. Ling Cod, *Ophiodon elongatus* were observed at six sites, similar to the past two years. Cabezon, *Scorpaenichthys marmoratus*, were relatively common and observed at nine sites, similar to the past four years. No giant black sea bass, *Stereolepis gigas* were observed at the 16 KFM sites this year. This year we began collecting whole fish counts as part of the Roving Diver Fish Count protocol. This protocol change is described in both the Results section and mentioned below in this discussion under Protocol Changes.

Overall, densities of *Coryphopterus nicholsii* continued to increase in 2003. We observed increases at seven sites, decreases at two sites, 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 the two sites which typically have the highest abundance of *L. dalli* and at both these sites densities were $0.0/m^2$, though several individuals were observed at the sites, similar to last year. Overall, *Alloclinus holderi* densities increased from 2002. We observed an increase at two sites, decrease at one site and little or no change at the remaining 13 sites. The increase in *A. holderi* correlates to slightly warmer than usual waters at the end of 2002. 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.

**Artificial Recruitment Modules (ARMs):**
ARMs were present and monitored at 10 of the monitoring sites in 2003. *Haliotis spp*. in the ARMs were discussed previously in this discussion. Similar to recent years there were no noticeable trends in *Cypraea spadicea* abundance among the 10 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. There were no noticeable trends in *Megathura crenulata* density in the ARMs, however most are small indicating some recruitment. There were no noticeable trends in *Crassedoma giganteum* densities among the sites. Overall, *Asterina miniata* densities remained about the same as last year with increases at three sites, decreases at three sites and little or no change at four sites. Overall, densities of *Pisaster giganteus* continued to decline in the ARMs for the second consecutive year with decreases at five sites and little or no change at five sites. Similar to last year, *Pycnopodia helianthoides* continued to decline at the sites where they were present in the ARMs, with decreases at three sites and little or no change at two sites.

In general, *Strongylocentrotus franciscanus* density in the ARMs decreased and mean size increased indicating little recruitment. Density of *S. franciscanus* decreased at four sites, increased at two sites and changed little at four sites while mean size increased at eight sites and decreased at two sites. *Strongylocentrotus purpuratus* density in the ARMs continued to decline and mean size continued to increase at most sites indicating low recruitment. Density of *S. purpuratus* deceased at six sites, increased at two sites and changed little at two sites, while mean size increased at five sites, decreased at three sites and changed little at two sites. *Centrostephanus coronatus* continued to decline and were present at only two sites with low densities. However, the one individual found at Yellowbanks was small and indicative of a recent recruitment.

**Temperature:**
At all sites where StowAway™ temperature loggers had been deployed along with the Tidbit temperature loggers, the data were cross-referenced. Both loggers recorded temperatures -+ 0.2 degree Celsius of each other (within the manufacturer's specifications). We had several of the StowAway™ loggers fail, one due to a housing that flooded. The Tidbit™ loggers have all been working well with no failures. This year only Tidbit™ loggers were deployed, two at each site.

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

Live threaded abalone, *Haliotis assimilis*, were observed for the third consecutive year at the monitoring sites. This year we observed *H. assimilis* at two sites, similar to 2002. Five were observed at Yellow Banks and three were observed at Gull Island. Similar to last year, they had a relatively wide size range from 29-70mm indicating more than one year of recruitment, but no recruitment this past year.

Small ocean sunfish, *Mola mola* were common on the way to Santa Barbara Island; these have been notably abundant in throughout the Southern California Bight this year.

By-the-wind-sailors, *Vellela vellela* were observed around all over the Southern California Bight in April, including San Clemente Island.

The sheep crab, *Loxorhynchus grandis* was common at all of the Santa Barbara Island sites this year, but was noticeably less abundant than the past two years.

There was a noticeable increase in amphipod tub mats this year at many of the sites. There is much variability in this species, but it seems to more often associate with cooler water. The encrusting worms, spirorbids were also noticeably more abundant at many of the sites this year.

**Other Notes:**

**Protocol Changes:**
As part of an agreement with the U.S. Navy, four kelp forest monitoring sites were installed at San Clemente Island. These four sites were added to the kelp forest monitoring data base, and their site descriptions and summary data will be included in these Annual Reports. However, a special report was submitted to the Navy and any discussion related to those sites is included in that report and not this Annual Report. Monitoring of the San Clemente sites is funded through 2004, but after that will be contingent on additional funding.

Mid 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 counting fish, 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 . When fish Counts were made we also entered the appropriate abundance code (S, F, C, or M) into the data base to facilitate comparison to past years.

Pre-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 was added, Count. The Count field is the actual whole number of fish an observer observed at the site during the 30 minute Roving Diver Fish Count.

*Lithopoma gibberosum* was formally added to the quadrat data sheet in 2003. Though this has been an indicator species since 1985, it had never been formally added in large part because this species is only consistently observed at a few sites (it is a colder water species). As a result, years where this species was not observed, often zeros were not entered into the data base. From 2003 and forward, zero's will be entered when this species is absent from quadrats, same as the other indicator species counted on quadrats. Since this species was not on the quadrat sheet prior to 2003, it is difficult to tell from past years if it was observed.

*Ophiothrix spiculata* is one of the few motile species we have made an exception for and counted on the Random Point Contact protocol. This species has become notably more prevalent in the past decade at the Channel Islands and we have felt for several years now that it should be a separate indicator species instead of being mixed in with the Miscellaneous Invertebrate category on RPCs. In 2003, *Ophiothrix spiculata* was separated out of the miscellaneous invertebrate category on RPCs. *Ophiothrix spiculata* now has a separate species code (# 11010). Now that this is separated out of the Miscellaneous Invertebrate category, we have had to rename this category. The Miscellaneous invertebrate category for the years 1982-2002 now Miscellaneous invertebrates including *O. spiculata* (species # 13001), and from 2003 – present there is a new category, Miscellaneous Invertebrates excluding *O. spiculata* (species # 13002). This year and in future years, the original miscellaneous invertebrate category (13001) can still be compared to past years by combining species 13002 (Miscellaneous invertebrates excluding *O. spiculata*) with species 11010 (*Ophiothrix spiculata*).

We occasionally observe the large brown macroalgae *Agarum fimbriatum* and this was common at one of our sites at San Clemente Island. As a result we added the species as a potential write-in species and assigned it the species numbers 2015 for adults (greater than 10cm wide blade) and 2015.5 for juveniles (less than 10cm wide blade). This will be an optional/write-in species for quadrats beginning in 2003. We anticipate that divers may have a difficult time distinguishing between *Agarum sp*. and *Dictyoneuropsis sp*. If this becomes a problem in the future, we may want to cover both these genus under these species codes.

We recommend adding a species code for *Tegula regina* and adding this to quadrats, ARMs and size frequency's. This species is a warm water species, is easy to identify and as a result would be a good indicator species for this monitoring program.

**Sampling Difficulties:**
All proposed data collection was completed this year except for some temperature data as a result of missing temperature loggers. Unfortunately the temperature housing including the loggers was stolen at Johnson's Lee North, similar to the temperature loggers that were stolen at Johnson's Lee South in 2002. We know that the Loggers were purposefully removed since the four nuts (two on top and two on bottom) that are tightened together were all removed. This could only be done using tools. We presume it was the same person who removed the temperature loggers at Johnson's Lee South site in 2002. As a result, there will be no temperature data available for Johnson's Lee North for the year these were deployed.

**Kelp Forest Monitoring Staff:**
In 2003, the core KFM staff were David Kushner, Paula Rich, Jonathan Shaffer and Kirstin Kamps.

**Data Requests:**
In 2003, we filled ten formal requests for data from the Park's kelp forest monitoring program. These requests were as follow: Ian Taniguchi with the California Department of Fish and Game was sent all of the Lithopoma undosum density and size frequency data. Laura Rodgers-Bennett with the California Department of Fish and game sent all of the abalone and size frequency data. Dr. Allan Stewart-Oaten at the University of California at Santa Barbara was sent all of the KFM data for his long-term statistical work. Harry Liquornik, a commercial dive fisher at the Channel Islands was sent all the *Strongylocentrotus franciscanus* density summaries and size frequency data. All of the KFM data were sent to Chris Cadlow of NOAA for their project "A Biological Assessment of living Marine Resources of the Channel Islands National Marine Sanctuary. The KFM quadrat data were sent to the Jason Project to be used in their Channel Islands educational curriculum. Cynthia Taylor, a grad student in the Integrative Oceanography Division of Scripps Institution of Oceanography was sent the Sebastes Atrovirens data from the fish transects and roving diver fish count. All KFM data were sent to Dr. Benjamin Halpern at the National Center for Ecological Analysis and Synthesis. He is working with Dr. Mark Carr focusing on the kelp forest data base to look generally at how various natural and anthropogenic factors can affect community. All of the KFM data on *Haliotis sorenseni* was sent to Michael Behrens at the University of California at Santa Barbara, he will be presenting this information at the next Channel Islands Symposium. All of the KFM sea star and temperature data were sent to Dr. Carol Blanchet at the

University of California, Santa Barbara, she will be using this for a presentation at the next Channel Islands Symposium. In addition, we were able to collect *Cystoseira sp*. samples for Julio Harvey at the University of California at Santa Cruz for a genetics study.

**Publications:**
The following publications using KFM were published in 2003:

Grantham, B. A., G. L. Eckert, and A. L. Shanks. 2003. Dispersal Potential of Marine Invertebrates in Diverse Habitat. Ecological Applications, 13(1) Supplement, 2003, pp. S108-S116.

**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 this program, please write to the address below:

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

# ACKNOWLEDGEMENTS

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We are deeply indebted to the many divers who have participated in this project in 2003 (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 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.

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

**Table 1. Continued.**

| TAXA/COMMON NAME | SCIENTIFIC NAME | TECHNIQUE |
|---|---|---|
| **INVERTEBRATES Continued:** | | |
| Green abalone | *Haliotis fulgens* | B,S |
| Kellet's whelk | *Kelletia kelletii* | B,S |
| Giant keyhole limpet | *Megathura crenulata* | B,S |
| California brown sea hare | *Aplysia californica* | B |
| Rock scallop | *Crassedoma giganteum* | B,S |
| California spiny lobster | *Panulirus interruptus* | B |
| Tunicates | | R |
| Stalked tunicate | *Styela montereyensis* | Q |
| Miscellaneous invertebrates | | R |
| **FISH** | | |
| Bluebanded goby | *Lythrypnus dalli* | Q |
| Blackeye goby | *Coryphopterus nicholsii* | Q |
| Island kelpfish | *Alloclinus holderi* | Q |
| Blacksmith | *Chromis punctipinnis* | V |
| Señorita | *Oxyjulis californica* | V |
| Blue rockfish | *Sebastes mystinus* | V |
| Olive rockfish | *Sebastes serranoides* | V |
| Kelp rockfish | *Sebastes atrovirens* | V |
| Kelp bass | *Paralabrax clathratus* | V |
| California Sheephead | *Semicossyphus pulcher* | V |
| Black surfperch | *Embiotoca jacksoni* | V |
| Striped surfperch | *Embiotoca lateralis* | V |
| Pile perch | *Damalichthys vacca* | V |
| Garibaldi | *Hypsypops rubicundus* | V |
| Opaleye | *Girella nigricans* | V |
| Rock Wrasse | *Halichoeres semicinctus* | V |
| **SUBSTRATE:** | | |
| Bare substrate | | R |
| Substrate types: Rock | | R |
| Cobble | | R |
| Sand | | R |

**Technique Codes:**

B= Band Transect
Q= Quadrat
R= Random Point Contact
M= $5m^2$-Quadrat
S= Size frequency Measurement
V= Visual Transect

**CHANGES IN SCIENTIFIC NOMENCLATURE:**

| | | |
|---|---|---|
| *Patiria miniata* | = | *Asterina miniata* |
| *Astraea undosum* | = | *Lithopoma undosum* |
| *Astraea gibberosa* | = | *Lithopoma gibberosum* |
| *Hinnites giganteum* | = | *Crassedoma giganteum* |
| *Allopora californica* | = | *Stylaster californica* |
| *Telia lofotensis* | = | *Urticina lofotensis* |

**Table 2:** Station Information.

| ISLAND | LOCATION | ABBREVIATION | DEPTH METERS | YEAR ESTABLISHED |
|---|---|---|---|---|
| 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.

| TECHNIQUE | SAMPLE NUMBER OF SIZE REPLICATES |
|---|---|
| Quadrat count | 1 m X 1 m 24X / site |
| Band Transect count | 3 m X 10 m 24X / site |
| $5m^2$-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:**

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

**Table 4:** 2003 Kelp forest monitoring site status.

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

**Table 5**: 2003 Kelp Forest Monitoring Program participant and cruise list.

| PARTICIPANTS | AFFILIATION | CRUISES PARTICIPATED |
|---|---|---|
| Akins, Leah | University of California, Davis | 1 |
| Bullard, Aimee | California State University, Fullerton | 1,4 |
| Collier, Chantal | Bay Keepers | 1 |
| Conti, John | Volunteer, Channel Islands National Park | 1,5 |
| Conway, Mike | Channel Islands National Park | 6 |
| Dawson, Cindy | California Department of Fish and Game | 1 |
| Donahue, Megan | University of California, Davis | 1 |
| Etherington, Lisa | USGS | 2 |
| Ferrar, David | University of California, Santa Barbara | 4 |
| Greenley, Ashley | University of California, Santa Barbara | 8 |
| Guardino, Michael | Monterey Bay Aquarium | 4 |
| Haaker, Peter | California Department of Fish and Game | 1,3 |
| Johnson, Clair | Channel Islands National Marine Sanctuary | 4 |
| Jon Johnson | Channel Islands National Park | 8 |
| Kamps, Kirsten | Channel Islands National Park | 2,3,4,5,6,7,8 |
| Kushner, David | Channel Islands National Park | 1,2,3,4,5,6,7,8 |
| Mobley, Chris | Channel Islands National Marine Sanctuary | 5 |
| Neuman, Melissa | NOAA | 7 |
| Osorio, David | California Department of Fish and Game | 7 |
| Pattison, Christine | California Department of Fish and Game | 1 |
| Provo, John | Channel Islands National Park | 1,2,4,5,6,7,8 |
| Readdie, Mark | University of California, Santa Cruz | 2 |
| Reed, Brendon | California State University, San Diego | 3 |
| Rich, Paula | Channel Islands National Park | 1,2,3,4,5,6,7,8 |
| Richards, Dan | Channel Islands National Park | 1,6 |
| Rogers-Bennett, Laura | California Department of Fish and Game | 1 |
| Shaffer, Jonathan | Channel Islands National Park | 1,2,3,4,5,6,7 |
| Springer, Yuri | University of California, Santa Cruz | 2 |
| Taniguchi, Ian | California Department of Fish and Game | 1,3,5,6 |
| Ugoretz, John | California Department of Fish and Game | 3 |
| Valle, Chuck | California Department of Fish and Game | 2,6 |
| Witting, David | NOAA | 7 |

| CRUISE NUMBER | 2003 CRUISE DATES | KELP FOREST MONITORING SITES VISITED |
|---|---|---|
| 1 | May 27 – June 3 | CLNWH, CLBSC, CLEP, CLHBC |
| 2 | July 7-11 | SBSESL, SBAP, SBCC, ANAR, ANCC |
| 3 | July 21-25 | SCFH, SCPB, SCGI, ANCC |
| 4 | August 4-8 | SCGI, SRJLS, SRJLN, SCYB, ANLC |
| 5 | August 18-22 | ANAR, SBSESL, SBAP, SCSA, SCPB, SRRR |
| 6 | September 8-12 | SCGI, SMWL, SMMM, SMHR, ANLC |
| 7 | September 22-26 | SCYB, SRJLN, SRJLS, SRRR, SMHR, SMWL, SCSA |
| 8 | October 6-9 | ANCC, ANLC, SCFH, SCSA, SCYB |

**Table 6:** 2003 Echinoderm wasting disease/syndrome observations.

| ISLAND/SITE | Sea Star Wasting Syndrome | | Sea Urchin Wasting Syndrome | |
|---|---|---|---|---|
| | SPECIES OBSERVED | DATE(s) | SPECIES OBSERVED | DATE(s) |
| **San Miguel Island** | | | | |
| Wyckoff Ledge | None | | None | |
| Hare Rock | None | | None | |
| Miracle Mile | None | | None | |
| **Santa Rosa Island** | | | | |
| Johnson's Lee North | None | | None | |
| Johnson's Lee South | None | | None | |
| Rodes Reef | None | | None | |
| **Santa Cruz Island** | | | | |
| Gull Island South | None | | None | |
| Fry's Harbor | None | | None | |
| Pelican Bay | 1 | 8/20 | 3 | 8/20 |
| Scorpion Anchorage | 1 | 8/20 | 2 | 8/20 |
| " " | 10 | 9/26 | | |
| Yellowbanks | None | | None | |
| **Anacapa Island** | | | | |
| Admiral's Reef | None | | None | |
| Cathedral Cove | None | | None | |
| Landing Cove | None | | None | |
| **Santa Barbara Island** | | | | |
| SE Sea Lion Rookery | None | | None | |
| Arch Point | None | | None | |
| Cat Canyon | None | | None | |
| **San Clemente Island** | | | | |
| Northwest Harbor | None | | None | |
| Boy Scout Camp | None | | None | |
| Eel Point | None | | None | |
| Horse Beach Cove | None | | None | |

**SPECIES LEGEND:**

1 = *Asterina* (*Asterina (Patiria)) miniata*
2 = *Strongylocentrotus purpuratus*
3 = *Lytechinus anamesus*
4 = *Pisaster giganteus*
5 = *Astrometis sertulifera*
6 = *Strongylocentrotus franciscanus*
7 = *Parastichopus parvimensis*
8 = *Dermasterias imbricata*
9 = *Mediaster aequalis*
10 = *Pycnopodia helianthoides*

none = not observed at this site during our visits in 2003
date = date(s) disease/syndrome was observed

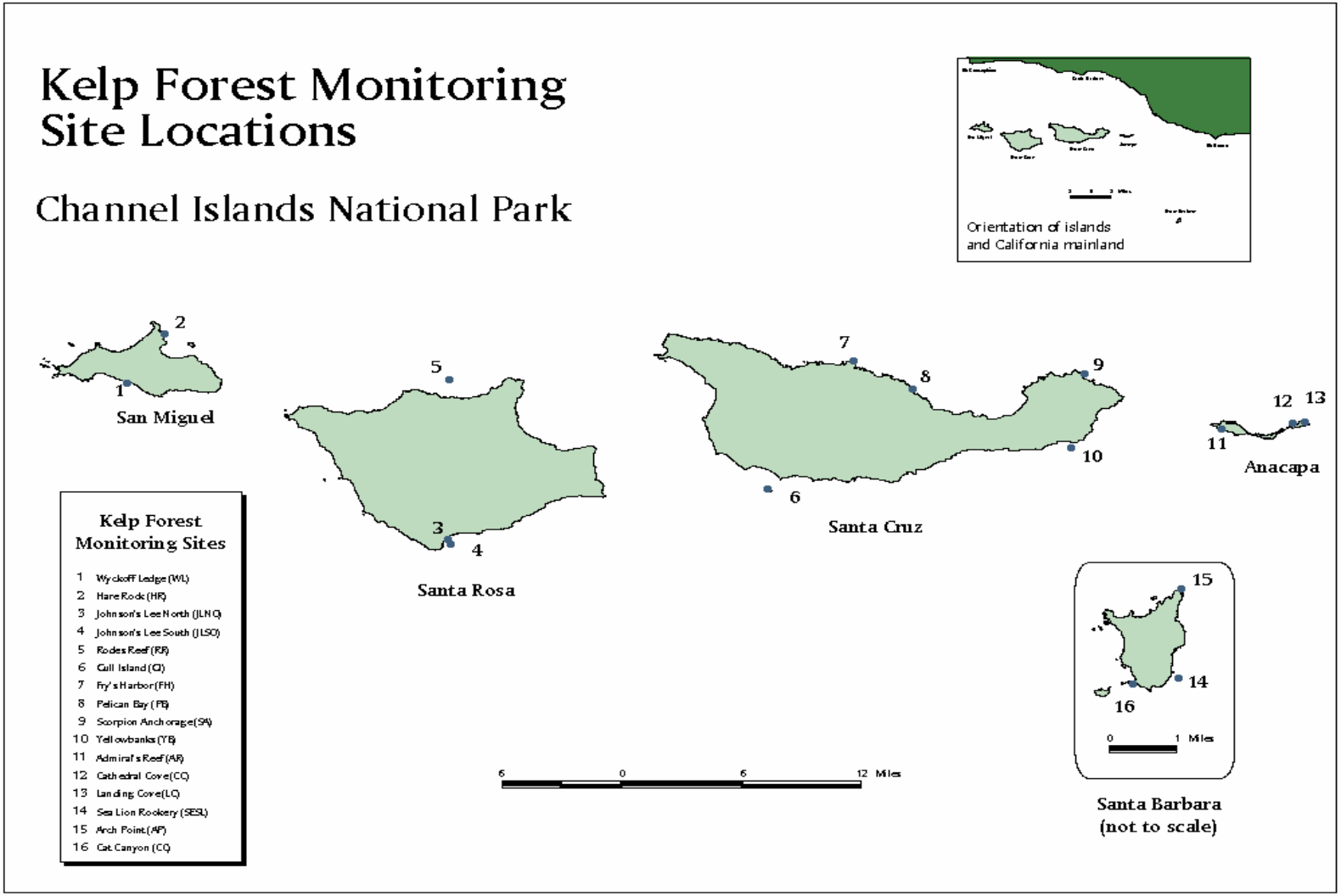
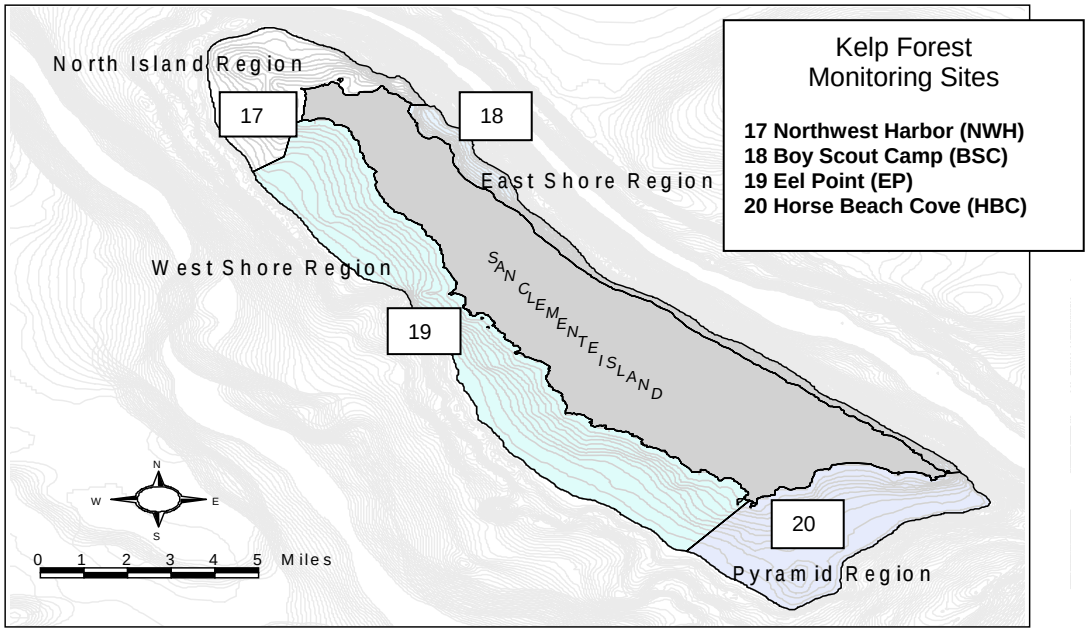



Figure 1: **Kelp Forest Monitoring Location**

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



## Appendix A: Quadrat

2003 QUADRAT DATA: MEAN NUMBER PER M² 

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| San Miguel Island - Wyckoff Ledge | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.6250** | **0.6077** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.3750** | **0.8013** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica adult* | **0.5417** | **0.8908** | **12** |
| *Pterygophora californica juvenile* | **0.1667** | **0.3257** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0417** | **0.1443** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.4583** | **0.5418** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **2.0417** | **1.4687** | **12** |
| *Pisaster giganteus* | **0.2500** | **0.3989** | **12** |
| *Strongylocentrotus franciscanus* | **7.0417** | **12.0103** | **12** |
| *Strongylocentrotus purpuratus* | **0.7500** | **1.2703** | **12** |
| *Parastichopus parvimensis* | **0.0000** | **0.0000** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.1667** | **0.3257** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.4583** | **0.8908** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |
| San Miguel Island - Hare Rock | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.2500** | **0.3989** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.6667** | **1.8627** | **12** |
| *Eisenia arborea adult* | **0.0417** | **0.1443** | **12** |
| *Eisenia arborea juvenile* | **0.0833** | **0.1946** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.0417** | **0.1443** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **1.8333** | **1.9462** | **12** |
| *Pisaster giganteus* | **0.2500** | **0.5000** | **12** |
| *Strongylocentrotus franciscanus* | **3.1250** | **4.5733** | **12** |
| *Strongylocentrotus purpuratus* | **1.1250** | **1.5972** | **12** |
| *Parastichopus parvimensis* | **0.0000** | **0.0000** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.2500** | **0.4523** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Santa Rosa Island - Johnson's Lee North | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **1.0833** | **0.6686** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.3333** | **0.8616** | **12** |
| *Eisenia arborea adult* | **0.0417** | **0.1443** | **12** |
| *Eisenia arborea juvenile* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica adult* | **0.1667** | **0.4438** | **12** |
| *Pterygophora californica juvenile* | **0.4167** | **0.4687** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.3750** | **0.4330** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.5000** | **0.5641** | **12** |
| *Pisaster giganteus* | **0.5417** | **0.6557** | **12** |
| *Strongylocentrotus franciscanus* | **2.4583** | **5.7305** | **12** |
| *Strongylocentrotus purpuratus* | **0.0417** | **0.1443** | **12** |
| *Parastichopus parvimensis* | **0.0417** | **0.1443** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **6.0833** | **2.4939** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.0833** | **0.1946** | **12** |
| *Alloclinus holderi* | **0.0417** | **0.1443** | **12** |
| Santa Rosa Island - Johnson's Lee South | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.9167** | **0.8483** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.5417** | **1.1572** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0833** | **0.1946** | **12** |
| *Pterygophora californica adult* | **0.0833** | **0.1946** | **12** |
| *Pterygophora californica juvenile* | **0.1667** | **0.2462** | **12** |
| *Laminaria farlowii adult* | **0.0833** | **0.1946** | **12** |
| *Laminaria farlowii juvenile* | **0.3333** | **0.4438** | **12** |
| *Cypraea spadicea* | **0.7500** | **1.1580** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **2.3333** | **1.1348** | **12** |
| *Pisaster giganteus* | **0.2500** | **0.4523** | **12** |
| *Strongylocentrotus franciscanus* | **5.5417** | **10.3780** | **12** |
| *Strongylocentrotus purpuratus* | **0.9583** | **0.9876** | **12** |
| *Parastichopus parvimensis* | **0.0417** | **0.1443** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **1.4167** | **1.6353** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.8750** | **1.0252** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Santa Rosa Island - Rodes Reef | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.4167** | **0.8747** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **1.6667** | **3.6390** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.1667** | **0.3257** | **12** |
| *Cypraea spadicea* | **0.0417** | **0.1443** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **2.4167** | **2.2445** | **12** |
| *Pisaster giganteus* | **0.7083** | **0.9160** | **12** |
| *Strongylocentrotus franciscanus* | **2.5417** | **6.4683** | **12** |
| *Strongylocentrotus purpuratus* | **0.0000** | **0.0000** | **12** |
| *Parastichopus parvimensis* | **0.0000** | **0.0000** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.1667** | **0.3892** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |
| Santa Cruz Island - Gull Island South | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.4167** | **0.5149** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.5833** | **1.8688** | **12** |
| *Eisenia arborea adult* | **0.1667** | **0.3257** | **12** |
| *Eisenia arborea juvenile* | **0.5000** | **0.9770** | **12** |
| *Pterygophora californica adult* | **0.1250** | **0.2261** | **12** |
| *Pterygophora californica juvenile* | **0.0417** | **0.1443** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **2.5000** | **1.4771** | **12** |
| *Pisaster giganteus* | **0.2500** | **0.3989** | **12** |
| *Strongylocentrotus franciscanus* | **0.1250** | **0.2261** | **12** |
| *Strongylocentrotus purpuratus* | **0.0417** | **0.1443** | **12** |
| *Parastichopus parvimensis* | **0.0833** | **0.1946** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.8333** | **0.7177** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Santa Cruz Island - Fry's Harbor | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.0000** | **0.0000** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.2083** | **0.5823** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.5417** | **0.9643** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **1.8333** | **1.5126** | **12** |
| *Pisaster giganteus* | **0.7083** | **0.7821** | **12** |
| *Strongylocentrotus franciscanus* | **0.3333** | **0.3892** | **12** |
| *Strongylocentrotus purpuratus* | **4.3333** | **4.5193** | **12** |
| *Parastichopus parvimensis* | **0.7083** | **0.8107** | **12** |
| *Centrostephanus coronatus* | **0.0833** | **0.1946** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **2.9167** | **1.6629** | **12** |
| *Alloclinus holderi* | **0.1667** | **0.2462** | **12** |
| Santa Cruz Island - Pelican Bay | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.0000** | **0.0000** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.0417** | **0.1443** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.8333** | **0.8348** | **12** |
| *Pisaster giganteus* | **0.0417** | **0.1443** | **12** |
| *Lytechinus anamesus* | **2.9583** | **2.8160** | **12** |
| *Strongylocentrotus franciscanus* | **2.0833** | **2.3629** | **12** |
| *Strongylocentrotus purpuratus* | **27.9583** | **18.7331** | **12** |
| *Parastichopus parvimensis* | **0.2083** | **0.3343** | **12** |
| *Centrostephanus coronatus* | **0.2083** | **0.4502** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **8.8333** | **1.9924** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Santa Cruz Island - Scorpion Anchorage | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.0000** | **0.0000** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.2917** | **0.7217** | **12** |
| *Lithopoma undosum* | **0.2500** | **0.5000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.5000** | **0.6030** | **12** |
| *Pisaster giganteus* | **0.2083** | **0.3343** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| *Strongylocentrotus franciscanus* | **3.1250** | **3.0905** | **12** |
| *Strongylocentrotus purpuratus* | **73.1250** | **42.6045** | **12** |
| *Parastichopus parvimensis* | **0.2083** | **0.5823** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **2.9167** | **1.0624** | **12** |
| *Alloclinus holderi* | **0.0833** | **0.1946** | **12** |
| Santa Cruz Island - Yellow Banks | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **2.2083** | **1.5588** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **7.3333** | **4.8021** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0417** | **0.1443** | **12** |
| *Pterygophora californica adult* | **1.2500** | **1.0553** | **12** |
| *Pterygophora californica juvenile* | **0.9167** | **0.7017** | **12** |
| *Laminaria farlowii adult* | **0.0417** | **0.1443** | **12** |
| *Laminaria farlowii juvenile* | **0.1250** | **0.2261** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.1667** | **0.2462** | **12** |
| *Lithopoma gibberosum* | **0.0417** | **0.1443** | **12** |
| *Asterina miniata* | **0.7500** | **0.5000** | **12** |
| *Pisaster giganteus* | **0.0417** | **0.1443** | **12** |
| *Lytechinus anamesus* | **0.2083** | **0.4981** | **12** |
| *Strongylocentrotus franciscanus* | **0.5417** | **1.8764** | **12** |
| *Strongylocentrotus purpuratus* | **1.2083** | **1.5294** | **12** |
| *Parastichopus parvimensis* | **0.0417** | **0.1443** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **1.7917** | **1.2695** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Anacapa Island - Admiral's Reef | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.0000** | **0.0000** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.1250** | **0.2261** | **12** |
| *Lithopoma undosum* | **0.0833** | **0.1946** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.7917** | **1.0757** | **12** |
| *Pisaster giganteus* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| *Strongylocentrotus franciscanus* | **4.3333** | **3.0773** | **12** |
| *Strongylocentrotus purpuratus* | **8.9167** | **9.0374** | **12** |
| *Parastichopus parvimensis* | **0.3333** | **0.3257** | **12** |
| *Centrostephanus coronatus* | **0.7083** | **0.8107** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **1.7083** | **1.4994** | **12** |
| *Alloclinus holderi* | **0.4583** | **0.5418** | **12** |
| Anacapa Island - Cathedral Cove | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.2083** | **0.7217** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **1.4583** | **1.4994** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0417** | **0.1443** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0833** | **0.1946** | **12** |
| *Cypraea spadicea* | **0.0833** | **0.1946** | **12** |
| *Lithopoma undosum* | **2.4167** | **1.8566** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.7500** | **0.8118** | **12** |
| *Pisaster giganteus* | **0.0833** | **0.1946** | **12** |
| *Strongylocentrotus franciscanus* | **4.3333** | **3.2287** | **12** |
| *Strongylocentrotus purpuratus* | **1.1250** | **1.1894** | **12** |
| *Parastichopus parvimensis* | **1.0000** | **0.9770** | **12** |
| *Centrostephanus coronatus* | **0.0417** | **0.1443** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **1.5417** | **1.4841** | **12** |
| *Alloclinus holderi* | **0.6250** | **0.5691** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Anacapa Island - Landing Cove | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.6250** | **1.2271** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **8.8750** | **9.7097** | **12** |
| *Eisenia arborea adult* | **0.7500** | **1.3568** | **12** |
| *Eisenia arborea juvenile* | **1.1667** | **1.3707** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.2917** | **0.4981** | **12** |
| *Laminaria farlowii adult* | **0.8750** | **2.5772** | **12** |
| *Laminaria farlowii juvenile* | **6.4583** | **8.1894** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **1.1667** | **0.9847** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Crassedoma giganteum* | **0.6250** | **1.0897** | **12** |
| *Asterina miniata* | **0.0000** | **0.0000** | **12** |
| *Pisaster giganteus* | **0.0833** | **0.1946** | **12** |
| *Strongylocentrotus franciscanus* | **3.7500** | **1.8647** | **12** |
| *Strongylocentrotus purpuratus* | **3.9583** | **2.5536** | **12** |
| *Parastichopus parvimensis* | **1.0833** | **1.0188** | **12** |
| *Centrostephanus coronatus* | **0.0417** | **0.1443** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **1.5000** | **1.5954** | **12** |
| *Alloclinus holderi* | **0.6667** | **0.7177** | **12** |
| Santa Barbara Island - SE Sea Lion Rookery | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.1250** | **0.2261** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.2917** | **0.3965** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.0833** | **0.1946** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.0417** | **0.1443** | **12** |
| *Lithopoma undosum* | **0.7083** | **0.5418** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.4167** | **0.5573** | **12** |
| *Pisaster giganteus* | **0.0833** | **0.1946** | **12** |
| *Strongylocentrotus franciscanus* | **4.0833** | **3.8069** | **12** |
| *Strongylocentrotus purpuratus* | **0.2500** | **0.4523** | **12** |
| *Parastichopus parvimensis* | **0.3750** | **0.4330** | **12** |
| *Centrostephanus coronatus* | **0.6250** | **1.0252** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.7083** | **0.7217** | **12** |
| *Alloclinus holderi* | **0.4167** | **0.5149** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Santa Barbara Island - Arch Point | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.0000** | **0.0000** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **1.3750** | **2.1860** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.1250** | **0.3108** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **1.2917** | **1.7896** | **12** |
| *Pisaster giganteus* | **0.2917** | **0.3343** | **12** |
| *Strongylocentrotus franciscanus* | **10.7500** | **7.8726** | **12** |
| *Strongylocentrotus purpuratus* | **3.8750** | **3.9722** | **12** |
| *Parastichopus parvimensis* | **0.1667** | **0.3257** | **12** |
| *Centrostephanus coronatus* | **0.0833** | **0.2887** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.4167** | **0.7930** | **12** |
| *Alloclinus holderi* | **2.4583** | **0.8107** | **12** |
| Santa Barbara Island - Cat Canyon | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.0417** | **0.1443** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **0.2917** | **0.3343** | **12** |
| *Eisenia arborea adult* | **0.0000** | **0.0000** | **12** |
| *Eisenia arborea juvenile* | **0.2917** | **0.3343** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0000** | **0.0000** | **12** |
| *Cypraea spadicea* | **0.2083** | **0.3965** | **12** |
| *Lithopoma undosum* | **0.0417** | **0.1443** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.2500** | **0.3371** | **12** |
| *Pisaster giganteus* | **0.2500** | **0.3989** | **12** |
| *Strongylocentrotus franciscanus* | **4.9167** | **2.6010** | **12** |
| *Strongylocentrotus purpuratus* | **0.3750** | **1.0028** | **12** |
| *Parastichopus parvimensis* | **0.6250** | **0.5276** | **12** |
| *Centrostephanus coronatus* | **0.0417** | **0.1443** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.2083** | **0.5823** | **12** |
| *Alloclinus holderi* | **1.4167** | **0.9962** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| San Clemente Island - Northwest Harbor | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.7500** | **1.1382** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **2.0417** | **5.8327** | **12** |
| *Eisenia arborea adult* | **0.2917** | **0.4502** | **12** |
| *Eisenia arborea juvenile* | **0.0417** | **0.1443** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.1250** | **0.3108** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.2500** | **0.6216** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.0417** | **0.1443** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.0000** | **0.0000** | **12** |
| *Pisaster giganteus* | **0.0417** | **0.1443** | **12** |
| *Strongylocentrotus franciscanus* | **1.4583** | **2.0052** | **12** |
| *Strongylocentrotus purpuratus* | **0.7500** | **1.0113** | **12** |
| *Parastichopus parvimensis* | **0.0833** | **0.1946** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.2083** | **0.3343** | **12** |
| *Alloclinus holderi* | **0.1250** | **0.2261** | **12** |
| San Clemente Island - Boy Scout Camp | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.7917** | **1.1766** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **13.6667** | **17.3249** | **12** |
| *Eisenia arborea adult* | **0.1250** | **0.3108** | **12** |
| *Eisenia arborea juvenile* | **0.2500** | **0.5839** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **1.0833** | **2.4572** | **12** |
| *Agarum fimbriatum adult* | **0.2083** | **0.4981** | **12** |
| *Agarum fimbriatum juvenile* | **0.1250** | **0.3108** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.0000** | **0.0000** | **12** |
| *Pisaster giganteus* | **0.0000** | **0.0000** | **12** |
| *Strongylocentrotus franciscanus* | **0.3333** | **0.7177** | **12** |
| *Strongylocentrotus purpuratus* | **0.2500** | **0.7230** | **12** |
| *Parastichopus parvimensis* | **0.5000** | **0.6396** | **12** |
| *Centrostephanus coronatus* | **0.4167** | **0.6337** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.2083** | **0.4502** | **12** |
| *Coryphopterus nicholsii* | **2.6250** | **2.3561** | **12** |
| *Alloclinus holderi* | **0.0833** | **0.1946** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| San Clemente Island - Eel Point | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **1.8750** | **1.4001** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **8.9167** | **8.6755** | **12** |
| *Eisenia arborea adult* | **0.1667** | **0.5774** | **12** |
| *Eisenia arborea juvenile* | **0.0833** | **0.1946** | **12** |
| *Pterygophora californica adult* | **0.0000** | **0.0000** | **12** |
| *Pterygophora californica juvenile* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii adult* | **1.7083** | **2.1475** | **12** |
| *Laminaria farlowii juvenile* | **5.6667** | **7.1901** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.1250** | **0.3108** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.0000** | **0.0000** | **12** |
| *Pisaster giganteus* | **0.0417** | **0.1443** | **12** |
| *Strongylocentrotus franciscanus* | **1.2917** | **2.3008** | **12** |
| *Strongylocentrotus purpuratus* | **2.0000** | **2.3932** | **12** |
| *Parastichopus parvimensis* | **0.5000** | **0.6396** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.0000** | **0.0000** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |
| San Clemente Island - Horse Beach Cove | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **0.8750** | **0.7724** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **12.2083** | **14.2565** | **12** |
| *Eisenia arborea adult* | **0.2500** | **0.4523** | **12** |
| *Eisenia arborea juvenile* | **0.3750** | **0.5691** | **12** |
| *Pterygophora californica adult* | **0.0833** | **0.1946** | **12** |
| *Pterygophora californica juvenile* | **0.0417** | **0.1443** | **12** |
| *Laminaria farlowii adult* | **0.2917** | **0.7217** | **12** |
| *Laminaria farlowii juvenile* | **0.8750** | **1.5829** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.0417** | **0.1443** | **12** |
| *Lithopoma gibberosum* | **0.0000** | **0.0000** | **12** |
| *Asterina miniata* | **0.0000** | **0.0000** | **12** |
| *Pisaster giganteus* | **0.0000** | **0.0000** | **12** |
| *Strongylocentrotus franciscanus* | **1.1250** | **1.4001** | **12** |
| *Strongylocentrotus purpuratus* | **0.2500** | **0.4523** | **12** |
| *Parastichopus parvimensis* | **0.2917** | **0.3965** | **12** |
| *Centrostephanus coronatus* | **0.0417** | **0.1443** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.2083** | **0.2575** | **12** |
| *Alloclinus holderi* | **0.3333** | **0.4438** | **12** |

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| San Miguel Island - Miracle Mile | | | |
| *Macrocystis pyrifera Ad.(>1m)* | **1.3750** | **1.4636** | **12** |
| *Macrocystis pyrifera Juvenile (<1m)* | **3.4167** | **4.6163** | **12** |
| *Eisenia arborea adult* | **0.5417** | **1.0326** | **12** |
| *Eisenia arborea juvenile* | **2.2083** | **2.9807** | **12** |
| *Pterygophora californica adult* | **1.6250** | **2.9552** | **12** |
| *Pterygophora californica juvenile* | **7.7917** | **9.8453** | **12** |
| *Laminaria farlowii adult* | **0.0000** | **0.0000** | **12** |
| *Laminaria farlowii juvenile* | **0.0417** | **0.1443** | **12** |
| *Haliotis rufescens* | **0.2917** | **0.4981** | **12** |
| *Cypraea spadicea* | **0.0000** | **0.0000** | **12** |
| *Lithopoma undosum* | **0.0000** | **0.0000** | **12** |
| *Lithopoma gibberosum* | **0.0833** | **0.1946** | **12** |
| *Asterina miniata* | **2.5833** | **1.7816** | **12** |
| *Pisaster giganteus* | **0.6667** | **0.8348** | **12** |
| *Strongylocentrotus franciscanus* | **6.5833** | **7.1409** | **12** |
| *Strongylocentrotus purpuratus* | **0.9167** | **1.3456** | **12** |
| *Parastichopus parvimensis* | **0.4167** | **0.5573** | **12** |
| *Centrostephanus coronatus* | **0.0000** | **0.0000** | **12** |
| *Styela montereyensis* | **0.0000** | **0.0000** | **12** |
| *Lythrypnus dalli* | **0.0000** | **0.0000** | **12** |
| *Coryphopterus nicholsii* | **0.0833** | **0.1946** | **12** |
| *Alloclinus holderi* | **0.0000** | **0.0000** | **12** |

## Appendix B: 5-Meter Quadrat Data



2003 5-METER QUADRAT DATA: MEAN NUMBER PER M²

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

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| San Miguel Island - Wyckoff Ledge | | | |
| *Macrocystis pyrifera Adult* | **0.4300** | **0.4238** | **40** |
| *Macrocystis pyrifera Subadult* | **0.1950** | **0.2773** | **40** |
| *Pisaster giganteus* | **0.0150** | **0.0533** | **40** |
| San Miguel Island - Hare Rock | | | |
| *Macrocystis pyrifera Adult* | **0.1400** | **0.2274** | **40** |
| *Macrocystis pyrifera Subadult* | **0.1050** | **0.1632** | **40** |
| *Pisaster giganteus* | **0.2900** | **0.7218** | **40** |
| Santa Rosa Island - Johnson's Lee North | | | |
| *Macrocystis pyrifera Adult* | **0.7950** | **0.4930** | **40** |
| *Macrocystis pyrifera Subadult* | **0.2300** | **0.3188** | **40** |
| *Pisaster giganteus* | **0.3600** | **0.3901** | **40** |
| Santa Rosa Island - Johnson's Lee South | | | |
| *Macrocystis pyrifera Adult* | **0.3300** | **0.3582** | **40** |
| *Macrocystis pyrifera Subadult* | **0.2750** | **0.3128** | **40** |
| *Pisaster giganteus* | **0.1250** | **0.2295** | **40** |
| Santa Rosa Island - Rodes Reef | | | |
| *Macrocystis pyrifera Adult* | **0.0050** | **0.0316** | **40** |
| *Macrocystis pyrifera Subadult* | **0.3150** | **0.4246** | **40** |
| *Pisaster giganteus* | **0.6000** | **0.6226** | **40** |
| Santa Cruz Island - Gull Island South | | | |
| *Macrocystis pyrifera Adult* | **0.2850** | **0.2434** | **40** |
| *Macrocystis pyrifera Subadult* | **0.1850** | **0.3401** | **40** |
| *Pisaster giganteus* | **0.1600** | **0.2085** | **40** |
| Santa Cruz Island - Fry's Harbor | | | |
| *Macrocystis pyrifera Adult* | **0.0000** | **0.0000** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0000** | **0.0000** | **40** |
| *Pisaster giganteus* | **0.5500** | **0.5159** | **40** |
| Santa Cruz Island - Pelican Bay | | | |
| *Macrocystis pyrifera Adult* | **0.0000** | **0.0000** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0000** | **0.0000** | **40** |
| *Pisaster giganteus* | **0.1950** | **0.2050** | **40** |

2003 5-METER QUADRAT DATA: MEAN NUMBER PER $M^2$

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

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| Santa Cruz Island - Scorpion Anchorage | | | |
| *Macrocystis pyrifera Adult* | **0.0000** | **0.0000** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0000** | **0.0000** | **40** |
| *Pisaster giganteus* | **0.0600** | **0.1297** | **40** |
| Santa Cruz Island - Yellow Banks | | | |
| *Macrocystis pyrifera Adult* | **0.0200** | **0.0758** | **40** |
| *Macrocystis pyrifera Subadult* | **2.3750** | **1.2691** | **40** |
| *Pisaster giganteus* | **0.0750** | **0.1256** | **40** |
| Anacapa Island - Admiral's Reef | | | |
| *Macrocystis pyrifera Adult* | **0.0000** | **0.0000** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0100** | **0.0441** | **40** |
| *Pisaster giganteus* | **0.0100** | **0.0441** | **40** |
| Anacapa Island - Cathedral Cove | | | |
| *Macrocystis pyrifera Adult* | **0.0200** | **0.1265** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0850** | **0.3867** | **40** |
| *Pisaster giganteus* | **0.0400** | **0.0810** | **40** |
| Anacapa Island - Landing Cove | | | |
| *Macrocystis pyrifera Adult* | **0.0150** | **0.0700** | **40** |
| *Macrocystis pyrifera Subadult* | **1.6450** | **2.0308** | **40** |
| *Pisaster giganteus* | **0.0150** | **0.0700** | **40** |
| Santa Barbara Island - SE Sea Lion Rookery | | | |
| *Macrocystis pyrifera Adult* | **0.0200** | **0.0758** | **40** |
| *Macrocystis pyrifera Subadult* | **0.1450** | **0.2900** | **40** |
| *Pisaster giganteus* | **0.0650** | **0.1145** | **40** |
| Santa Barbara Island - Arch Point | | | |
| *Macrocystis pyrifera Adult* | **0.0000** | **0.0000** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0000** | **0.0000** | **40** |
| *Pisaster giganteus* | **0.0900** | **0.1499** | **40** |
| Santa Barbara Island - Cat Canyon | | | |
| *Macrocystis pyrifera Adult* | **0.0000** | **0.0000** | **40** |
| *Macrocystis pyrifera Subadult* | **0.0300** | **0.0853** | **40** |
| *Pisaster giganteus* | **0.0750** | **0.1335** | **40** |

2003 5-METER QUADRAT DATA: MEAN NUMBER PER $M^2$

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

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| San Clemente Island - Northwest Harbor | | | |
| *Macrocystis pyrifera Adult* | **0.3650** | **0.3231** | **40** |
| *Macrocystis pyrifera Subadult* | **0.1700** | **0.2053** | **40** |
| *Pisaster giganteus* | **0.0650** | **0.1145** | **40** |
| San Clemente Island - Boy Scout Camp | | | |
| *Macrocystis pyrifera Adult* | **0.1150** | **0.1748** | **40** |
| *Macrocystis pyrifera Subadult* | **0.3400** | **0.5821** | **40** |
| *Pisaster giganteus* | **0.0150** | **0.0533** | **40** |
| San Clemente Island - Eel Point | | | |
| *Macrocystis pyrifera Adult* | **0.0850** | **0.1968** | **40** |
| *Macrocystis pyrifera Subadult* | **1.5600** | **1.2347** | **40** |
| *Pisaster giganteus* | **0.0100** | **0.0441** | **40** |
| San Clemente Island - Horse Beach Cove | | | |
| *Macrocystis pyrifera Adult* | **0.1900** | **0.2716** | **40** |
| *Macrocystis pyrifera Subadult* | **0.5900** | **0.6717** | **40** |
| *Pisaster giganteus* | **0.0050** | **0.0316** | **40** |
| San Miguel Island - Miracle Mile | | | |
| *Macrocystis pyrifera Adult* | **0.2450** | **0.3404** | **40** |
| *Macrocystis pyrifera Subadult* | **0.8900** | **0.9058** | **40** |
| *Pisaster giganteus* | **0.2400** | **0.2762** | **40** |

Appendix C: Band Transect Data



2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **San Miguel Island - Wyckoff Ledge** | | | |
| *Tethya aurantia* | **0.1653** | **0.1053** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.3056** | **0.2170** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0597** | **0.0621** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.1597** | **0.0557** | **12** |
| *Megathura crenulata* | **0.0042** | **0.0075** | **12** |
| *Crassedoma giganteum* | **0.0083** | **0.0112** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0083** | **0.0133** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **San Miguel Island - Hare Rock** | | | |
| *Tethya aurantia* | **0.0236** | **0.0305** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0069** | **0.0111** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0014** | **0.0048** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0014** | **0.0048** | **12** |
| *Megathura crenulata* | **0.0000** | **0.0000** | **12** |
| *Crassedoma giganteum* | **0.0056** | **0.0109** | **12** |
| *Aplysia californica* | **0.0056** | **0.0192** | **12** |
| *Pycnopodia helianthoides* | **0.0514** | **0.0359** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **Santa Rosa Island - Johnson's Lee North** | | | |
| *Tethya aurantia* | **0.1181** | **0.0500** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0181** | **0.0166** | **12** |
| *Lophogorgia chilensis* | **0.0028** | **0.0065** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0028** | **0.0065** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0014** | **0.0048** | **12** |
| *Megathura crenulata* | **0.0083** | **0.0151** | **12** |
| *Crassedoma giganteum* | **0.0083** | **0.0167** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0944** | **0.0473** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |

2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **Santa Rosa Island - Johnson's Lee South** | | | |
| *Tethya aurantia* | **0.2833** | **0.0888** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.1028** | **0.0692** | **12** |
| *Lophogorgia chilensis* | **0.0792** | **0.0427** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0014** | **0.0048** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0014** | **0.0048** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0319** | **0.0392** | **12** |
| *Megathura crenulata* | **0.0083** | **0.0167** | **12** |
| *Crassedoma giganteum* | **0.0097** | **0.0150** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0819** | **0.0351** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **Santa Rosa Island - Rodes Reef** | | | |
| *Tethya aurantia* | **0.1139** | **0.0550** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0514** | **0.0261** | **12** |
| *Lophogorgia chilensis* | **0.0028** | **0.0065** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0222** | **0.0217** | **12** |
| *Megathura crenulata* | **0.0375** | **0.0427** | **12** |
| *Crassedoma giganteum* | **0.0083** | **0.0112** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0833** | **0.0517** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **Santa Cruz Island - Gull Island South** | | | |
| *Tethya aurantia* | **0.0097** | **0.0132** | **12** |
| *Stylaster californica* | **0.0764** | **0.1097** | **12** |
| *Urticina lofotensis* | **0.0014** | **0.0048** | **12** |
| *Lophogorgia chilensis* | **0.0139** | **0.0139** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0111** | **0.0130** | **12** |
| *Megathura crenulata* | **0.0028** | **0.0065** | **12** |
| *Crassedoma giganteum* | **0.0000** | **0.0000** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0292** | **0.0311** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |

2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **Santa Cruz Island - Fry's Harbor** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.2264** | **0.2125** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0014** | **0.0048** | **12** |
| *Megathura crenulata* | **0.0375** | **0.0467** | **12** |
| *Crassedoma giganteum* | **0.0028** | **0.0065** | **12** |
| *Aplysia californica* | **0.0028** | **0.0065** | **12** |
| *Pycnopodia helianthoides* | **0.0208** | **0.0247** | **12** |
| *Lytechinus anamesus* | **0.0194** | **0.0536** | **12** |
| **Santa Cruz Island - Pelican Bay** | | | |
| *Tethya aurantia* | **0.0125** | **0.0203** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.1569** | **0.1383** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0028** | **0.0065** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0014** | **0.0048** | **12** |
| *Megathura crenulata* | **0.0000** | **0.0000** | **12** |
| *Crassedoma giganteum* | **0.0069** | **0.0111** | **12** |
| *Aplysia californica* | **0.0042** | **0.0075** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **1.1444** | **0.5709** | **12** |
| **Santa Cruz Island - Scorpion Anchorage** | | | |
| *Tethya aurantia* | **0.0250** | **0.0392** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0042** | **0.0075** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0014** | **0.0048** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0000** | **0.0000** | **12** |
| *Megathura crenulata* | **0.0403** | **0.0405** | **12** |
| *Crassedoma giganteum* | **0.0278** | **0.0205** | **12** |
| *Aplysia californica* | **0.0792** | **0.1179** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0042** | **0.0075** | **12** |

2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **Santa Cruz Island - Yellow Banks** | | | |
| *Tethya aurantia* | **0.0139** | **0.0172** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0042** | **0.0075** | **12** |
| *Lophogorgia chilensis* | **0.1639** | **0.1032** | **12** |
| *Muricea fruticosa* | **0.0083** | **0.0087** | **12** |
| *Muricea californica* | **0.0208** | **0.0190** | **12** |
| *Panulirus interruptus* | **0.0056** | **0.0192** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0486** | **0.0592** | **12** |
| *Megathura crenulata* | **0.0250** | **0.0207** | **12** |
| *Crassedoma giganteum* | **0.0028** | **0.0065** | **12** |
| *Aplysia californica* | **0.0083** | **0.0289** | **12** |
| *Pycnopodia helianthoides* | **0.0153** | **0.0241** | **12** |
| *Lytechinus anamesus* | **0.3597** | **0.4844** | **12** |
| **Anacapa Island - Admiral's Reef** | | | |
| *Tethya aurantia* | **0.0097** | **0.0150** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0486** | **0.0321** | **12** |
| *Muricea fruticosa* | **0.0028** | **0.0096** | **12** |
| *Muricea californica* | **0.0319** | **0.0270** | **12** |
| *Panulirus interruptus* | **0.0014** | **0.0048** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0125** | **0.0203** | **12** |
| *Megathura crenulata* | **0.0569** | **0.0495** | **12** |
| *Crassedoma giganteum* | **0.0528** | **0.0643** | **12** |
| *Aplysia californica* | **0.0306** | **0.0347** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0069** | **0.0150** | **12** |
| **Anacapa Island - Cathedral Cove** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0028** | **0.0065** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0181** | **0.0386** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0000** | **0.0000** | **12** |
| *Megathura crenulata* | **0.0139** | **0.0186** | **12** |
| *Crassedoma giganteum* | **0.0389** | **0.0645** | **12** |
| *Aplysia californica* | **0.0069** | **0.0194** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |

2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **Anacapa Island - Landing Cove** | | | |
| *Tethya aurantia* | **0.0056** | **0.0082** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0139** | **0.0244** | **12** |
| *Muricea fruticosa* | **0.0014** | **0.0048** | **12** |
| *Muricea californica* | **0.0014** | **0.0048** | **12** |
| *Panulirus interruptus* | **0.0236** | **0.0372** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0014** | **0.0048** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0042** | **0.0144** | **12** |
| *Megathura crenulata* | **0.0181** | **0.0219** | **12** |
| *Crassedoma giganteum* | **0.3083** | **0.3137** | **12** |
| *Aplysia californica* | **0.0014** | **0.0048** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **Santa Barbara Island - SE Sea Lion Rookery** | | | |
| *Tethya aurantia* | **0.1028** | **0.0651** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.1264** | **0.0750** | **12** |
| *Muricea fruticosa* | **0.0056** | **0.0109** | **12** |
| *Muricea californica* | **0.0167** | **0.0142** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0042** | **0.0075** | **12** |
| *Megathura crenulata* | **0.0083** | **0.0151** | **12** |
| *Crassedoma giganteum* | **0.0042** | **0.0075** | **12** |
| *Aplysia californica* | **0.0069** | **0.0166** | **12** |
| *Pycnopodia helianthoides* | **0.0083** | **0.0133** | **12** |
| *Lytechinus anamesus* | **0.0056** | **0.0109** | **12** |
| **Santa Barbara Island - Arch Point** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0042** | **0.0075** | **12** |
| *Muricea fruticosa* | **0.0028** | **0.0065** | **12** |
| *Muricea californica* | **0.0014** | **0.0048** | **12** |
| *Panulirus interruptus* | **0.0042** | **0.0075** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0000** | **0.0000** | **12** |
| *Megathura crenulata* | **0.0028** | **0.0065** | **12** |
| *Crassedoma giganteum* | **0.0097** | **0.0150** | **12** |
| *Aplysia californica* | **0.0069** | **0.0111** | **12** |
| *Pycnopodia helianthoides* | **0.0042** | **0.0075** | **12** |
| *Lytechinus anamesus* | **0.0222** | **0.0428** | **12** |

2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **Santa Barbara Island - Cat Canyon** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0028** | **0.0065** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0000** | **0.0000** | **12** |
| *Megathura crenulata* | **0.0028** | **0.0065** | **12** |
| *Crassedoma giganteum* | **0.0056** | **0.0082** | **12** |
| *Aplysia californica* | **0.0042** | **0.0075** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **San Clemente Island - Northwest Harbor** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0597** | **0.0474** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0028** | **0.0065** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0181** | **0.0181** | **12** |
| *Megathura crenulata* | **0.0028** | **0.0065** | **12** |
| *Crassedoma giganteum* | **0.0014** | **0.0048** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **San Clemente Island - Boy Scout Camp** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0042** | **0.0104** | **12** |
| *Muricea fruticosa* | **0.0097** | **0.0111** | **12** |
| *Muricea californica* | **0.0681** | **0.0474** | **12** |
| *Panulirus interruptus* | **0.0222** | **0.0287** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0111** | **0.0109** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0000** | **0.0000** | **12** |
| *Megathura crenulata* | **0.0000** | **0.0000** | **12** |
| *Crassedoma giganteum* | **0.0014** | **0.0048** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |

2003 BAND TRANSECT DATA: MEAN NUMBER PER

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| **San Clemente Island - Eel Point** | | | |
| *Tethya aurantia* | **0.0000** | **0.0000** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0042** | **0.0104** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0056** | **0.0148** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0569** | **0.0854** | **12** |
| *Megathura crenulata* | **0.0153** | **0.0150** | **12** |
| *Crassedoma giganteum* | **0.0014** | **0.0048** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **San Clemente Island - Horse Beach Cove** | | | |
| *Tethya aurantia* | **0.0028** | **0.0065** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.0000** | **0.0000** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0028** | **0.0065** | **12** |
| *Muricea californica* | **0.0472** | **0.0643** | **12** |
| *Panulirus interruptus* | **0.0278** | **0.0358** | **12** |
| *Haliotis rufescens* | **0.0000** | **0.0000** | **12** |
| *Haliotis corrugata* | **0.0097** | **0.0194** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0111** | **0.0164** | **12** |
| *Megathura crenulata* | **0.0097** | **0.0111** | **12** |
| *Crassedoma giganteum* | **0.0000** | **0.0000** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0000** | **0.0000** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |
| **San Miguel Island - Miracle Mile** | | | |
| *Tethya aurantia* | **0.1181** | **0.0520** | **12** |
| *Stylaster californica* | **0.0000** | **0.0000** | **12** |
| *Urticina lofotensis* | **0.1611** | **0.0973** | **12** |
| *Lophogorgia chilensis* | **0.0000** | **0.0000** | **12** |
| *Muricea fruticosa* | **0.0000** | **0.0000** | **12** |
| *Muricea californica* | **0.0000** | **0.0000** | **12** |
| *Panulirus interruptus* | **0.0000** | **0.0000** | **12** |
| *Haliotis rufescens* | **0.6472** | **0.5861** | **12** |
| *Haliotis corrugata* | **0.0000** | **0.0000** | **12** |
| *Haliotis fulgens* | **0.0000** | **0.0000** | **12** |
| *Kelletia kelletii* | **0.0083** | **0.0167** | **12** |
| *Megathura crenulata* | **0.0903** | **0.0571** | **12** |
| *Crassedoma giganteum* | **0.0069** | **0.0166** | **12** |
| *Aplysia californica* | **0.0000** | **0.0000** | **12** |
| *Pycnopodia helianthoides* | **0.0264** | **0.0207** | **12** |
| *Lytechinus anamesus* | **0.0000** | **0.0000** | **12** |

# Appendix D: Random Point Contact Data



## San Miguel Island - Wyckoff Ledge

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 5.333 | 5.9662 | 15 |
| *Desmarestia Spp.* | 1.000 | 3.8730 | 15 |
| *Cystoseira Spp.* | 2.000 | 4.1404 | 15 |
| *Macrocystis pyrifera All* | 19.000 | 17.7231 | 15 |
| *Eisenia arborea All* | 0.667 | 1.9970 | 15 |
| *Pterygophora californica All* | 5.667 | 11.0384 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 24.833 | 11.4746 | 15 |
| *Articulated Coralline Algae* | 14.500 | 19.6442 | 15 |
| *Encrusting Coralline Algae* | 30.000 | 18.7560 | 15 |
| *Gelidium Spp.* | 0.167 | 0.6455 | 15 |
| *Gigartina Spp.* | 0.500 | 1.0351 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.167 | 0.6455 | 15 |
| *Sponges* | 1.833 | 1.9970 | 15 |
| *Corynactis californica* | 0.833 | 2.6163 | 15 |
| *Balanophyllia elegans* | 1.667 | 2.0412 | 15 |
| *Astrangia lajollaensis* | 0.333 | 0.8797 | 15 |
| *Diopatra ornata* | 10.500 | 9.6455 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 23.500 | 14.6933 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 5.167 | 5.1293 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 6.167 | 5.3341 | 15 |
| *Bare Substrate* | 26.167 | 30.1168 | 15 |
| *Rock* | 70.667 | 32.1057 | 15 |
| *Cobble* | 5.333 | 8.0659 | 15 |
| *Sand* | 24.000 | 25.6139 | 15 |

## San Miguel Island - Hare Rock

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 51.000 | 19.9508 | 15 |
| *Miscellaneous Brown Algae* | 0.167 | 0.6455 | 15 |
| *Desmarestia Spp.* | 15.667 | 20.3862 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 11.167 | 12.2061 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.167 | 0.6455 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 8.000 | 5.7632 | 15 |
| *Articulated Coralline Algae* | 0.833 | 1.8094 | 15 |
| *Encrusting Coralline Algae* | 48.333 | 18.1430 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 0.333 | 0.8797 | 15 |
| *Corynactis californica* | 2.000 | 2.3528 | 15 |
| *Balanophyllia elegans* | 0.167 | 0.6455 | 15 |
| *Astrangia lajollaensis* | 0.333 | 0.8797 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 29.333 | 9.6578 | 15 |
| *Diaperoecia californica* | 1.333 | 2.8137 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 0.500 | 1.0351 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 10.333 | 6.4688 | 15 |
| *Bare Substrate* | 18.833 | 17.6995 | 15 |
| *Rock* | 76.500 | 29.8478 | 15 |
| *Cobble* | 20.333 | 29.3663 | 15 |
| *Sand* | 3.167 | 3.9491 | 15 |

## Santa Rosa Island - Johnson's Lee North

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 0.000 | 0.0000 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 2.667 | 4.7684 | 15 |
| *Macrocystis pyrifera All* | 33.000 | 18.4971 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.833 | 2.0412 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 9.333 | 5.4663 | 15 |
| *Articulated Coralline Algae* | 1.833 | 2.2093 | 15 |
| *Encrusting Coralline Algae* | 5.833 | 5.7992 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 1.500 | 2.0702 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 1.167 | 2.8137 | 15 |
| *Corynactis californica* | 4.333 | 5.5474 | 15 |
| *Balanophyllia elegans* | 3.167 | 2.7495 | 15 |
| *Astrangia lajollaensis* | 1.667 | 2.7817 | 15 |
| *Diopatra ornata* | 0.833 | 1.5430 | 15 |
| *Phragmatopoma californica* | 5.833 | 8.1650 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 30.333 | 7.9545 | 15 |
| *Diaperoecia californica* | 1.167 | 2.2887 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 37.333 | 13.7408 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 8.833 | 7.0626 | 15 |
| *Bare Substrate* | 6.500 | 5.7321 | 15 |
| *Rock* | 92.333 | 7.7613 | 15 |
| *Cobble* | 4.167 | 6.3854 | 15 |
| *Sand* | 3.500 | 5.1582 | 15 |

## Santa Rosa Island - Johnson's Lee South

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 0.167 | 0.6455 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.167 | 0.6455 | 15 |
| *Macrocystis pyrifera All* | 27.667 | 25.4332 | 15 |
| *Eisenia arborea All* | 0.833 | 2.6163 | 15 |
| *Pterygophora californica All* | 2.667 | 4.8612 | 15 |
| *Laminaria farlowii All* | 1.500 | 2.2756 | 15 |
| *Miscellaneous Red Algae* | 28.167 | 18.5998 | 15 |
| *Articulated Coralline Algae* | 4.000 | 4.6098 | 15 |
| *Encrusting Coralline Algae* | 14.667 | 8.0659 | 15 |
| *Gelidium Spp.* | 0.333 | 0.8797 | 15 |
| *Gigartina Spp.* | 2.000 | 2.5355 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 0.667 | 1.4840 | 15 |
| *Corynactis californica* | 6.333 | 13.0885 | 15 |
| *Balanophyllia elegans* | 6.333 | 5.2497 | 15 |
| *Astrangia lajollaensis* | 1.167 | 1.5999 | 15 |
| *Diopatra ornata* | 14.333 | 11.9323 | 15 |
| *Phragmatopoma californica* | 0.167 | 0.6455 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 24.833 | 11.8196 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.167 | 0.6455 | 15 |
| *Tunicates* | 10.667 | 5.0415 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 10.000 | 5.2610 | 15 |
| *Bare Substrate* | 7.000 | 6.7612 | 15 |
| *Rock* | 75.333 | 19.6366 | 15 |
| *Cobble* | 2.667 | 3.9491 | 15 |
| *Sand* | 22.000 | 19.0207 | 15 |

## Santa Rosa Island - Rodes Reef

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 0.000 | 0.0000 | 15 |
| *Desmarestia Spp.* | 44.667 | 42.6768 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 9.167 | 8.5391 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 24.500 | 13.1339 | 15 |
| *Articulated Coralline Algae* | 2.333 | 3.4675 | 15 |
| *Encrusting Coralline Algae* | 67.667 | 10.9163 | 15 |
| *Gelidium Spp.* | 1.333 | 2.0845 | 15 |
| *Gigartina Spp.* | 3.167 | 6.3010 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 1.333 | 1.5999 | 15 |
| *Corynactis californica* | 0.667 | 1.1443 | 15 |
| *Balanophyllia elegans* | 1.833 | 2.4029 | 15 |
| *Astrangia lajollaensis* | 9.833 | 12.1180 | 15 |
| *Diopatra ornata* | 0.500 | 1.4015 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 8.000 | 4.8366 | 15 |
| *Diaperoecia californica* | 0.333 | 0.8797 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 2.667 | 3.3363 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 2.333 | 3.0570 | 15 |
| *Bare Substrate* | 3.833 | 5.2497 | 15 |
| *Rock* | 82.667 | 17.6389 | 15 |
| *Cobble* | 15.000 | 16.3390 | 15 |
| *Sand* | 2.333 | 2.7495 | 15 |

## Santa Cruz Island - Gull Island South

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 0.000 | 0.0000 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 1.000 | 1.8420 | 15 |
| *Macrocystis pyrifera All* | 23.667 | 16.3354 | 15 |
| *Eisenia arborea All* | 0.500 | 1.4015 | 15 |
| *Pterygophora californica All* | 0.500 | 1.0351 | 15 |
| *Laminaria farlowii All* | 0.167 | 0.6455 | 15 |
| *Miscellaneous Red Algae* | 1.500 | 1.8420 | 15 |
| *Articulated Coralline Algae* | 1.000 | 1.5811 | 15 |
| *Encrusting Coralline Algae* | 33.667 | 13.3920 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 1.000 | 1.8420 | 15 |
| *Corynactis californica* | 4.667 | 6.6726 | 15 |
| *Balanophyllia elegans* | 1.833 | 1.9970 | 15 |
| *Astrangia lajollaensis* | 0.667 | 1.1443 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 26.167 | 10.2586 | 15 |
| *Diaperoecia californica* | 4.833 | 4.2748 | 15 |
| *Pachythyone rubra* | 0.167 | 0.6455 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 5.500 | 3.6839 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 27.833 | 7.8414 | 15 |
| *Bare Substrate* | 5.667 | 7.8755 | 15 |
| *Rock* | 97.667 | 5.7838 | 15 |
| *Cobble* | 1.833 | 5.1293 | 15 |
| *Sand* | 0.500 | 1.0351 | 15 |

## Santa Cruz Island - Fry's Harbor

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 1.167 | 1.5999 | 15 |
| *Miscellaneous Brown Algae* | 0.833 | 2.0412 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 0.000 | 0.0000 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 11.333 | 6.3994 | 15 |
| *Articulated Coralline Algae* | 0.167 | 0.6455 | 15 |
| *Encrusting Coralline Algae* | 38.833 | 14.5119 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 3.167 | 2.7495 | 15 |
| *Sponges* | 0.000 | 0.0000 | 15 |
| *Corynactis californica* | 0.667 | 1.4840 | 15 |
| *Balanophyllia elegans* | 0.500 | 1.4015 | 15 |
| *Astrangia lajollaensis* | 10.000 | 6.2678 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 15.833 | 9.2421 | 15 |
| *Diaperoecia californica* | 7.833 | 12.6373 | 15 |
| *Pachythyone rubra* | 10.833 | 14.2574 | 15 |
| *Ophiothrix spiculata* | 8.667 | 14.6953 | 15 |
| *Tunicates* | 0.833 | 1.5430 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 7.833 | 6.6054 | 15 |
| *Bare Substrate* | 12.167 | 9.2999 | 15 |
| *Rock* | 84.833 | 13.2107 | 15 |
| *Cobble* | 14.000 | 12.4929 | 15 |
| *Sand* | 1.167 | 2.0845 | 15 |

## Santa Cruz Island - Pelican Bay

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.167 | 0.6455 | 15 |
| *Miscellaneous Brown Algae* | 0.167 | 0.6455 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 0.000 | 0.0000 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 3.667 | 3.3894 | 15 |
| *Articulated Coralline Algae* | 0.167 | 0.6455 | 15 |
| *Encrusting Coralline Algae* | 52.500 | 18.1512 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 8.000 | 5.7632 | 15 |
| *Sponges* | 0.167 | 0.6455 | 15 |
| *Corynactis californica* | 0.167 | 0.6455 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 6.500 | 4.0970 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 0.667 | 1.4840 | 15 |
| *Diaperoecia californica* | 0.167 | 0.6455 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 4.000 | 8.5982 | 15 |
| *Bare Substrate* | 34.000 | 19.3834 | 15 |
| *Rock* | 61.833 | 18.5998 | 15 |
| *Cobble* | 23.333 | 13.0133 | 15 |
| *Sand* | 14.833 | 12.7639 | 15 |

## Santa Cruz Island - Scorpion Anchorage

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.333 | 0.8797 | 15 |
| *Miscellaneous Brown Algae* | 0.333 | 1.2910 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 0.000 | 0.0000 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 9.167 | 6.5918 | 15 |
| *Articulated Coralline Algae* | 0.667 | 1.1443 | 15 |
| *Encrusting Coralline Algae* | 65.667 | 12.4451 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 4.667 | 6.9991 | 15 |
| *Sponges* | 0.167 | 0.6455 | 15 |
| *Corynactis californica* | 0.333 | 0.8797 | 15 |
| *Balanophyllia elegans* | 0.833 | 1.8094 | 15 |
| *Astrangia lajollaensis* | 1.000 | 1.8420 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 0.000 | 0.0000 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 0.167 | 0.6455 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 15.000 | 10.9789 | 15 |
| *Bare Substrate* | 19.167 | 11.2863 | 15 |
| *Rock* | 82.167 | 11.4902 | 15 |
| *Cobble* | 3.500 | 3.9866 | 15 |
| *Sand* | 14.333 | 12.3732 | 15 |

## Santa Cruz Island - Yellow Banks

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.333 | 0.8797 | 15 |
| *Miscellaneous Brown Algae* | 3.167 | 5.1293 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 9.667 | 7.6687 | 15 |
| *Macrocystis pyrifera All* | 39.500 | 20.0045 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 11.667 | 11.7893 | 15 |
| *Laminaria farlowii All* | 1.167 | 2.2887 | 15 |
| *Miscellaneous Red Algae* | 3.667 | 5.2497 | 15 |
| *Articulated Coralline Algae* | 4.333 | 3.5940 | 15 |
| *Encrusting Coralline Algae* | 47.333 | 15.3666 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 0.333 | 0.8797 | 15 |
| *Corynactis californica* | 0.333 | 1.2910 | 15 |
| *Balanophyllia elegans* | 0.333 | 0.8797 | 15 |
| *Astrangia lajollaensis* | 0.667 | 1.1443 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 6.333 | 5.8909 | 15 |
| *Diaperoecia californica* | 0.500 | 1.4015 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.667 | 1.4840 | 15 |
| *Tunicates* | 1.167 | 2.2887 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 22.000 | 13.0316 | 15 |
| *Bare Substrate* | 22.167 | 22.9881 | 15 |
| *Rock* | 77.667 | 29.0084 | 15 |
| *Cobble* | 13.167 | 15.6829 | 15 |
| *Sand* | 9.167 | 14.9901 | 15 |

## Anacapa Island - Admiral's Reef

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.667 | 1.4840 | 15 |
| *Miscellaneous Brown Algae* | 2.500 | 3.4069 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 0.000 | 0.0000 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 37.167 | 21.3572 | 15 |
| *Articulated Coralline Algae* | 0.333 | 0.8797 | 15 |
| *Encrusting Coralline Algae* | 38.833 | 18.6094 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 2.667 | 3.5940 | 15 |
| *Sponges* | 1.000 | 1.5811 | 15 |
| *Corynactis californica* | 3.667 | 4.5185 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 0.167 | 0.6455 | 15 |
| *Diopatra ornata* | 0.167 | 0.6455 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 1.333 | 2.0845 | 15 |
| *Diaperoecia californica* | 0.167 | 0.6455 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 38.833 | 33.6057 | 15 |
| *Tunicates* | 1.333 | 2.4761 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 15.500 | 12.9973 | 15 |
| *Bare Substrate* | 12.667 | 14.4996 | 15 |
| *Rock* | 87.500 | 15.8396 | 15 |
| *Cobble* | 0.500 | 1.4015 | 15 |
| *Sand* | 12.000 | 15.6468 | 15 |

## Anacapa Island - Cathedral Cove

| | | | |
|---|---|---|---|
| *Green Algae* | 2.167 | 2.6502 | 15 |
| *Miscellaneous Brown Algae* | 2.000 | 3.0178 | 15 |
| *Desmarestia Spp.* | 0.167 | 0.6455 | 15 |
| *Cystoseira Spp.* | 0.667 | 1.9970 | 15 |
| *Macrocystis pyrifera All* | 0.167 | 0.6455 | 15 |
| *Eisenia arborea All* | 0.000 | 0.0000 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 5.833 | 5.0592 | 15 |
| *Articulated Coralline Algae* | 8.833 | 6.5374 | 15 |
| *Encrusting Coralline Algae* | 62.500 | 12.2109 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 3.000 | 3.1623 | 15 |
| *Sponges* | 3.000 | 2.1547 | 15 |
| *Corynactis californica* | 0.000 | 0.0000 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 1.833 | 2.7495 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 10.000 | 6.0504 | 15 |
| *Diaperoecia californica* | 1.500 | 3.1053 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 2.833 | 3.2550 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 9.167 | 6.5918 | 15 |
| *Bare Substrate* | 9.667 | 9.8591 | 15 |
| *Rock* | 52.000 | 27.5357 | 15 |
| *Cobble* | 41.667 | 21.1007 | 15 |
| *Sand* | 6.333 | 8.6534 | 15 |

## Anacapa Island - Landing Cove

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.333 | 0.8797 | 15 |
| *Miscellaneous Brown Algae* | 12.833 | 10.6010 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 5.500 | 7.2703 | 15 |
| *Macrocystis pyrifera All* | 34.833 | 35.2601 | 15 |
| *Eisenia arborea All* | 23.333 | 27.2990 | 15 |
| *Pterygophora californica All* | 0.333 | 0.8797 | 15 |
| *Laminaria farlowii All* | 14.333 | 15.9370 | 15 |
| *Miscellaneous Red Algae* | 13.000 | 14.5529 | 15 |
| *Articulated Coralline Algae* | 14.167 | 10.0297 | 15 |
| *Encrusting Coralline Algae* | 36.500 | 21.2300 | 15 |
| *Gelidium Spp.* | 19.167 | 30.5115 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.167 | 0.6455 | 15 |
| *Sponges* | 3.333 | 4.5968 | 15 |
| *Corynactis californica* | 1.167 | 2.2887 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 2.167 | 2.0845 | 15 |
| *Diopatra ornata* | 0.500 | 1.4015 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 16.667 | 16.9734 | 15 |
| *Diaperoecia californica* | 3.333 | 6.0257 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 14.500 | 13.1339 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 3.667 | 4.6162 | 15 |
| *Bare Substrate* | 15.167 | 14.6832 | 15 |
| *Rock* | 72.667 | 26.7172 | 15 |
| *Cobble* | 17.833 | 18.8478 | 15 |
| *Sand* | 9.500 | 10.9463 | 15 |

## Santa Barbara Island - SE Sea Lion Rookery

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 3.167 | 5.5474 | 15 |
| *Miscellaneous Brown Algae* | 3.667 | 5.5795 | 15 |
| *Desmarestia Spp.* | 0.167 | 0.6455 | 15 |
| *Cystoseira Spp.* | 4.000 | 7.1838 | 15 |
| *Macrocystis pyrifera All* | 6.000 | 9.2002 | 15 |
| *Eisenia arborea All* | 0.833 | 2.2493 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 12.500 | 8.3452 | 15 |
| *Articulated Coralline Algae* | 0.167 | 0.6455 | 15 |
| *Encrusting Coralline Algae* | 55.000 | 18.1265 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 1.667 | 2.2493 | 15 |
| *Sponges* | 0.167 | 0.6455 | 15 |
| *Corynactis californica* | 2.667 | 5.2156 | 15 |
| *Balanophyllia elegans* | 0.833 | 1.5430 | 15 |
| *Astrangia lajollaensis* | 1.000 | 2.2756 | 15 |
| *Diopatra ornata* | 0.333 | 0.8797 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 7.333 | 8.9874 | 15 |
| *Diaperoecia californica* | 0.500 | 1.0351 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 21.167 | 18.7528 | 15 |
| *Tunicates* | 3.833 | 6.1140 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 4.000 | 2.8031 | 15 |
| *Bare Substrate* | 22.167 | 20.3730 | 15 |
| *Rock* | 77.167 | 18.9423 | 15 |
| *Cobble* | 2.500 | 4.4320 | 15 |
| *Sand* | 20.333 | 19.5226 | 15 |

## Santa Barbara Island - Arch Point

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 4.833 | 3.7161 | 15 |
| *Miscellaneous Brown Algae* | 7.667 | 10.7099 | 15 |
| *Desmarestia Spp.* | 1.500 | 5.8095 | 15 |
| *Cystoseira Spp.* | 0.667 | 1.4840 | 15 |
| *Macrocystis pyrifera All* | 0.000 | 0.0000 | 15 |
| *Eisenia arborea All* | 6.167 | 8.2303 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 13.667 | 7.2498 | 15 |
| *Articulated Coralline Algae* | 8.333 | 9.8046 | 15 |
| *Encrusting Coralline Algae* | 37.000 | 13.1339 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 39.000 | 13.5883 | 15 |
| *Sponges* | 0.333 | 0.8797 | 15 |
| *Corynactis californica* | 1.833 | 3.3363 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 0.500 | 1.9365 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 6.833 | 7.7036 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 4.667 | 3.8807 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 17.333 | 4.3780 | 15 |
| *Bare Substrate* | 11.000 | 8.3879 | 15 |
| *Rock* | 86.167 | 11.1350 | 15 |
| *Cobble* | 12.667 | 9.8863 | 15 |
| *Sand* | 1.167 | 2.6502 | 15 |

## Santa Barbara Island - Cat Canyon

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 2.833 | 3.6433 | 15 |
| *Miscellaneous Brown Algae* | 17.000 | 9.4112 | 15 |
| *Desmarestia Spp.* | 0.167 | 0.6455 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 0.333 | 0.8797 | 15 |
| *Eisenia arborea All* | 0.167 | 0.6455 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 6.833 | 8.7355 | 15 |
| *Articulated Coralline Algae* | 6.333 | 7.4322 | 15 |
| *Encrusting Coralline Algae* | 68.000 | 14.3987 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 26.833 | 6.5101 | 15 |
| *Sponges* | 0.333 | 0.8797 | 15 |
| *Corynactis californica* | 0.167 | 0.6455 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 0.833 | 1.5430 | 15 |
| *Diopatra ornata* | 0.500 | 1.9365 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.167 | 0.6455 | 15 |
| *Miscellaneous Bryozoans* | 6.333 | 5.5795 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 6.833 | 5.2156 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 3.500 | 3.1053 | 15 |
| *Bare Substrate* | 8.500 | 9.1026 | 15 |
| *Rock* | 91.167 | 13.2580 | 15 |
| *Cobble* | 2.667 | 4.6739 | 15 |
| *Sand* | 6.167 | 9.6763 | 15 |

## San Clemente Island - Northwest Harbor

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 2.333 | 4.9522 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.500 | 1.0351 | 15 |
| *Macrocystis pyrifera All* | 18.667 | 16.1706 | 15 |
| *Eisenia arborea All* | 0.500 | 1.9365 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 38.333 | 16.4117 | 15 |
| *Articulated Coralline Algae* | 22.667 | 9.5649 | 15 |
| *Encrusting Coralline Algae* | 15.000 | 7.8490 | 15 |
| *Gelidium Spp.* | 8.000 | 5.5259 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 1.333 | 1.8581 | 15 |
| *Corynactis californica* | 0.500 | 1.0351 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 2.333 | 3.4675 | 15 |
| *Diopatra ornata* | 0.000 | 0.0000 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 3.000 | 2.5355 | 15 |
| *Miscellaneous Bryozoans* | 4.000 | 3.9866 | 15 |
| *Diaperoecia californica* | 0.167 | 0.6455 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 11.333 | 6.7392 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 24.667 | 10.5164 | 15 |
| *Bare Substrate* | 19.167 | 26.0094 | 15 |
| *Rock* | 80.833 | 25.4717 | 15 |
| *Cobble* | 2.667 | 3.0570 | 15 |
| *Sand* | 16.500 | 26.4710 | 15 |

## San Clemente Island - Boy Scout Camp

| | | | |
|---|---|---|---|
| *Green Algae* | 8.000 | 15.9015 | 15 |
| *Miscellaneous Brown Algae* | 48.167 | 32.0778 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 0.000 | 0.0000 | 15 |
| *Macrocystis pyrifera All* | 19.000 | 19.3372 | 15 |
| *Eisenia arborea All* | 1.000 | 1.8420 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 9.333 | 12.6585 | 15 |
| *Miscellaneous Red Algae* | 12.000 | 8.9243 | 15 |
| *Articulated Coralline Algae* | 2.500 | 3.5355 | 15 |
| *Encrusting Coralline Algae* | 40.167 | 21.6190 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 0.833 | 1.5430 | 15 |
| *Corynactis californica* | 0.000 | 0.0000 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 0.500 | 1.4015 | 15 |
| *Diopatra ornata* | 0.333 | 0.8797 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 3.500 | 3.8730 | 15 |
| *Miscellaneous Bryozoans* | 5.667 | 6.5783 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 8.833 | 11.4512 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 0.833 | 1.5430 | 15 |
| *Bare Substrate* | 38.500 | 21.2300 | 15 |
| *Rock* | 76.167 | 21.7302 | 15 |
| *Cobble* | 2.333 | 5.2156 | 15 |
| *Sand* | 21.500 | 20.5461 | 15 |

## San Clemente Island - Eel Point

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Brown Algae* | 12.000 | 12.8938 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 1.667 | 2.6163 | 15 |
| *Macrocystis pyrifera All* | 30.000 | 18.6126 | 15 |
| *Eisenia arborea All* | 0.667 | 1.4840 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 12.833 | 11.5289 | 15 |
| *Miscellaneous Red Algae* | 50.333 | 16.0320 | 15 |
| *Articulated Coralline Algae* | 39.333 | 25.0262 | 15 |
| *Encrusting Coralline Algae* | 35.000 | 15.3239 | 15 |
| *Gelidium Spp.* | 3.000 | 3.8032 | 15 |
| *Gigartina Spp.* | 0.167 | 0.6455 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 1.000 | 2.2756 | 15 |
| *Corynactis californica* | 0.000 | 0.0000 | 15 |
| *Balanophyllia elegans* | 0.500 | 1.0351 | 15 |
| *Astrangia lajollaensis* | 0.167 | 0.6455 | 15 |
| *Diopatra ornata* | 1.000 | 1.5811 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 4.333 | 2.4029 | 15 |
| *Miscellaneous Bryozoans* | 4.667 | 5.3341 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 5.667 | 4.6739 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 1.000 | 1.8420 | 15 |
| *Bare Substrate* | 11.667 | 21.3948 | 15 |
| *Rock* | 79.833 | 24.9368 | 15 |
| *Cobble* | 6.000 | 9.3922 | 15 |
| *Sand* | 14.167 | 24.1769 | 15 |

## San Clemente Island - Horse Beach Cove

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 0.167 | 0.6455 | 15 |
| *Miscellaneous Brown Algae* | 16.000 | 15.2304 | 15 |
| *Desmarestia Spp.* | 0.000 | 0.0000 | 15 |
| *Cystoseira Spp.* | 7.333 | 5.7061 | 15 |
| *Macrocystis pyrifera All* | 14.333 | 12.8684 | 15 |
| *Eisenia arborea All* | 3.667 | 4.3164 | 15 |
| *Pterygophora californica All* | 0.000 | 0.0000 | 15 |
| *Laminaria farlowii All* | 1.333 | 3.3894 | 15 |
| *Miscellaneous Red Algae* | 12.833 | 10.4739 | 15 |
| *Articulated Coralline Algae* | 9.500 | 8.7219 | 15 |
| *Encrusting Coralline Algae* | 18.333 | 13.7797 | 15 |
| *Gelidium Spp.* | 1.667 | 2.2493 | 15 |
| *Gigartina Spp.* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 1.833 | 3.4675 | 15 |
| *Corynactis californica* | 0.000 | 0.0000 | 15 |
| *Balanophyllia elegans* | 0.000 | 0.0000 | 15 |
| *Astrangia lajollaensis* | 0.167 | 0.6455 | 15 |
| *Diopatra ornata* | 2.167 | 3.5187 | 15 |
| *Phragmatopoma californica* | 0.500 | 1.0351 | 15 |
| *Serpulorbis squamigerus* | 8.500 | 6.2536 | 15 |
| *Miscellaneous Bryozoans* | 11.333 | 6.1866 | 15 |
| *Diaperoecia californica* | 2.000 | 3.4330 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 8.333 | 8.1101 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 12.667 | 8.0438 | 15 |
| *Bare Substrate* | 34.500 | 23.2264 | 15 |
| *Rock* | 69.333 | 24.6125 | 15 |
| *Cobble* | 10.000 | 10.9381 | 15 |
| *Sand* | 20.667 | 22.8048 | 15 |

## San Miguel Island - Miracle Mile

| Species | Mean | Std. Dev. | n |
|---|---|---|---|
| *Green Algae* | 13.000 | 15.1540 | 15 |
| *Miscellaneous Brown Algae* | 0.333 | 1.2910 | 15 |
| *Desmarestia Spp.* | 23.667 | 23.6769 | 15 |
| *Cystoseira Spp.* | 1.000 | 1.5811 | 15 |
| *Macrocystis pyrifera All* | 25.167 | 27.4588 | 15 |
| *Eisenia arborea All* | 19.000 | 29.2740 | 15 |
| *Pterygophora californica All* | 27.500 | 34.6281 | 15 |
| *Laminaria farlowii All* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Red Algae* | 37.500 | 27.2718 | 15 |
| *Articulated Coralline Algae* | 23.167 | 24.3755 | 15 |
| *Encrusting Coralline Algae* | 51.833 | 21.9062 | 15 |
| *Gelidium Spp.* | 0.000 | 0.0000 | 15 |
| *Gigartina Spp.* | 3.500 | 5.4116 | 15 |
| *Miscellaneous Plants (ie: Diatoms)* | 0.000 | 0.0000 | 15 |
| *Sponges* | 6.000 | 5.9612 | 15 |
| *Corynactis californica* | 0.833 | 2.0412 | 15 |
| *Balanophyllia elegans* | 2.000 | 1.6903 | 15 |
| *Astrangia lajollaensis* | 0.000 | 0.0000 | 15 |
| *Diopatra ornata* | 0.333 | 1.2910 | 15 |
| *Phragmatopoma californica* | 0.000 | 0.0000 | 15 |
| *Serpulorbis squamigerus* | 0.000 | 0.0000 | 15 |
| *Miscellaneous Bryozoans* | 10.333 | 13.6887 | 15 |
| *Diaperoecia californica* | 0.000 | 0.0000 | 15 |
| *Pachythyone rubra* | 0.000 | 0.0000 | 15 |
| *Ophiothrix spiculata* | 0.000 | 0.0000 | 15 |
| *Tunicates* | 11.000 | 12.6350 | 15 |
| *Miscellaneous Invertebrates excluding Ophiothrix spiculata* | 4.667 | 7.7843 | 15 |
| *Bare Substrate* | 13.000 | 12.3996 | 15 |
| *Rock* | 83.833 | 15.2323 | 15 |
| *Cobble* | 5.667 | 13.0407 | 15 |
| *Sand* | 10.500 | 8.8741 | 15 |

# Appendix E: Fish Transect



2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
San Miguel Island - Wyckoff Ledge

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Chromis punctipinnis Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 9/9/2003 | **1.0000** | **1.4142** | **4** |
| *Sebastes mystinus Adult* | 9/25/2003 | **1.3750** | **1.9955** | **8** |
| *Sebastes mystinus Juvenile* | 9/9/2003 | **1.0000** | **1.4142** | **4** |
| *Sebastes mystinus Juvenile* | 9/25/2003 | **0.7500** | **1.0351** | **8** |
| *Sebastes serranoides Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 9/25/2003 | **0.6250** | **1.0607** | **8** |
| *Sebastes atrovirens Adult* | 9/9/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Adult* | 9/25/2003 | **1.1250** | **1.2464** | **8** |
| *Sebastes atrovirens Juvenile* | 9/9/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/25/2003 | **4.6250** | **3.1139** | **8** |
| *Paralabrax clathratus Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Female* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 9/9/2003 | **0.5000** | **0.5774** | **4** |
| *Embiotoca jacksoni Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Adult* | 9/9/2003 | **1.2500** | **1.5000** | **4** |
| *Embiotoca lateralis Adult* | 9/25/2003 | **0.7500** | **1.0351** | **8** |
| *Embiotoca lateralis Juvenile* | 9/9/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 9/25/2003 | **0.2500** | **0.4629** | **8** |
| *Damalichthys vacca Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 9/25/2003 | **1.7500** | **2.0529** | **8** |
| *Hypsypops rubicundus Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Juvenile* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 9/9/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/25/2003 | **0.0000** | **0.0000** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
San Miguel Island - Hare Rock

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Adult* | 9/25/2003 | **9.3750** | **5.3702** | **8** |
| *Chromis punctipinnis Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 9/25/2003 | **9.1250** | **3.7201** | **8** |
| *Oxyjulis californica Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 9/11/2003 | **2.5000** | **4.3589** | **4** |
| *Sebastes mystinus Adult* | 9/25/2003 | **1.2500** | **2.3755** | **8** |
| *Sebastes mystinus Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 9/25/2003 | **2.7500** | **2.7646** | **8** |
| *Sebastes serranoides Adult* | 9/11/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes serranoides Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 9/25/2003 | **1.3750** | **1.5980** | **8** |
| *Sebastes atrovirens Adult* | 9/11/2003 | **0.5000** | **1.0000** | **4** |
| *Sebastes atrovirens Adult* | 9/25/2003 | **0.1250** | **0.3536** | **8** |
| *Sebastes atrovirens Juvenile* | 9/11/2003 | **1.7500** | **2.3629** | **4** |
| *Sebastes atrovirens Juvenile* | 9/25/2003 | **0.3750** | **0.7440** | **8** |
| *Paralabrax clathratus Adult* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/25/2003 | **0.1250** | **0.3536** | **8** |
| *Semicossyphus pulcher Female* | 9/11/2003 | **0.7500** | **0.9574** | **4** |
| *Semicossyphus pulcher Female* | 9/25/2003 | **0.3750** | **0.7440** | **8** |
| *Semicossyphus pulcher Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 9/11/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Adult* | 9/11/2003 | **1.0000** | **0.8165** | **4** |
| *Embiotoca lateralis Adult* | 9/25/2003 | **1.8750** | **0.6409** | **8** |
| *Embiotoca lateralis Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/25/2003 | **0.7500** | **1.1650** | **8** |
| *Damalichthys vacca Adult* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 9/25/2003 | **0.3750** | **0.7440** | **8** |
| *Damalichthys vacca Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Adult* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Juvenile* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/25/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 9/11/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/25/2003 | **0.0000** | **0.0000** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Rosa Island - Johnson's Lee North

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 8/6/2003 | **1.2500** | **1.2583** | **4** |
| *Chromis punctipinnis Adult* | 9/23/2003 | **15.7500** | **26.1739** | **8** |
| *Chromis punctipinnis Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 8/6/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes mystinus Adult* | 9/23/2003 | **0.3750** | **0.7440** | **8** |
| *Sebastes mystinus Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Adult* | 8/6/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes serranoides Adult* | 9/23/2003 | **0.1250** | **0.3536** | **8** |
| *Sebastes serranoides Juvenile* | 8/6/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes serranoides Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Adult* | 8/6/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Adult* | 9/23/2003 | **0.5000** | **0.5345** | **8** |
| *Sebastes atrovirens Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Adult* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 9/23/2003 | **0.1250** | **0.3536** | **8** |
| *Paralabrax clathratus Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Female* | 8/6/2003 | **1.0000** | **1.1547** | **4** |
| *Semicossyphus pulcher Female* | 9/23/2003 | **1.0000** | **0.5345** | **8** |
| *Semicossyphus pulcher Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 8/6/2003 | **1.2500** | **1.8930** | **4** |
| *Embiotoca jacksoni Adult* | 9/23/2003 | **1.6250** | **1.5980** | **8** |
| *Embiotoca jacksoni Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/23/2003 | **0.5000** | **1.0690** | **8** |
| *Embiotoca lateralis Adult* | 8/6/2003 | **3.5000** | **4.1231** | **4** |
| *Embiotoca lateralis Adult* | 9/23/2003 | **0.8750** | **0.9910** | **8** |
| *Embiotoca lateralis Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/23/2003 | **0.2500** | **0.7071** | **8** |
| *Damalichthys vacca Adult* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 9/23/2003 | **0.6250** | **0.7440** | **8** |
| *Damalichthys vacca Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Adult* | 8/6/2003 | **0.5000** | **0.5774** | **4** |
| *Hypsypops rubicundus Adult* | 9/23/2003 | **0.1250** | **0.3536** | **8** |
| *Hypsypops rubicundus Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Juvenile* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 8/6/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/23/2003 | **0.1250** | **0.3536** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Rosa Island - Johnson's Lee South

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 8/5/2003 | **1.0000** | **1.4142** | **4** |
| *Chromis punctipinnis Adult* | 9/23/2003 | **1.5000** | **1.9272** | **8** |
| *Chromis punctipinnis Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 9/23/2003 | **6.2500** | **6.2048** | **8** |
| *Oxyjulis californica Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 8/5/2003 | **0.7500** | **0.9574** | **4** |
| *Sebastes mystinus Adult* | 9/23/2003 | **1.1250** | **1.4577** | **8** |
| *Sebastes mystinus Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 9/23/2003 | **1.2500** | **1.8323** | **8** |
| *Sebastes serranoides Adult* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 9/23/2003 | **0.2500** | **0.4629** | **8** |
| *Sebastes serranoides Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 9/23/2003 | **1.0000** | **0.7559** | **8** |
| *Sebastes atrovirens Adult* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 9/23/2003 | **1.3750** | **1.5980** | **8** |
| *Sebastes atrovirens Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/23/2003 | **0.5000** | **1.4142** | **8** |
| *Paralabrax clathratus Adult* | 8/5/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Adult* | 9/23/2003 | **0.2500** | **0.4629** | **8** |
| *Paralabrax clathratus Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/23/2003 | **0.1250** | **0.3536** | **8** |
| *Semicossyphus pulcher Female* | 8/5/2003 | **0.7500** | **1.5000** | **4** |
| *Semicossyphus pulcher Female* | 9/23/2003 | **1.0000** | **1.1952** | **8** |
| *Semicossyphus pulcher Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 8/5/2003 | **1.0000** | **2.0000** | **4** |
| *Embiotoca jacksoni Adult* | 9/23/2003 | **1.6250** | **1.0607** | **8** |
| *Embiotoca jacksoni Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/23/2003 | **0.6250** | **0.9161** | **8** |
| *Embiotoca lateralis Adult* | 8/5/2003 | **2.7500** | **2.7538** | **4** |
| *Embiotoca lateralis Adult* | 9/23/2003 | **3.3750** | **1.6850** | **8** |
| *Embiotoca lateralis Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/23/2003 | **0.5000** | **0.9258** | **8** |
| *Damalichthys vacca Adult* | 8/5/2003 | **1.0000** | **1.4142** | **4** |
| *Damalichthys vacca Adult* | 9/23/2003 | **2.2500** | **3.6936** | **8** |
| *Damalichthys vacca Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 9/23/2003 | **0.1250** | **0.3536** | **8** |
| *Hypsypops rubicundus Adult* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/23/2003 | **0.1250** | **0.3536** | **8** |
| *Girella nigricans Juvenile* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/23/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 8/5/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/23/2003 | **0.0000** | **0.0000** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Rosa Island - Rodes Reef

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Adult* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 8/21/2003 | **3.7500** | **3.3040** | **4** |
| *Oxyjulis californica Adult* | 9/24/2003 | **1.7500** | **2.8723** | **4** |
| *Oxyjulis californica Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 9/24/2003 | **1.7500** | **1.7078** | **4** |
| *Sebastes mystinus Juvenile* | 8/21/2003 | **2.2500** | **2.8723** | **4** |
| *Sebastes mystinus Juvenile* | 9/24/2003 | **1.2500** | **1.5000** | **4** |
| *Sebastes serranoides Adult* | 8/21/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes serranoides Adult* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/21/2003 | **5.2500** | **2.8723** | **4** |
| *Sebastes serranoides Juvenile* | 9/24/2003 | **2.0000** | **1.4142** | **4** |
| *Sebastes atrovirens Adult* | 8/21/2003 | **0.7500** | **0.9574** | **4** |
| *Sebastes atrovirens Adult* | 9/24/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/21/2003 | **0.5000** | **1.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/24/2003 | **0.5000** | **1.0000** | **4** |
| *Paralabrax clathratus Adult* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 9/24/2003 | **0.5000** | **0.5774** | **4** |
| *Paralabrax clathratus Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 9/24/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 8/21/2003 | **0.5000** | **1.0000** | **4** |
| *Embiotoca jacksoni Adult* | 9/24/2003 | **1.2500** | **1.8930** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/21/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/21/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca lateralis Adult* | 9/24/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 9/24/2003 | **0.5000** | **1.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/21/2003 | **1.0000** | **0.8165** | **4** |
| *Damalichthys vacca Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/24/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/21/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/24/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Cruz Island - Gull Island South

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/24/2003 | **24.0000** | **33.0252** | **4** |
| *Chromis punctipinnis Adult* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/4/2003 | **0.5000** | **1.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/24/2003 | **0.7500** | **0.5000** | **4** |
| *Sebastes mystinus Juvenile* | 8/4/2003 | **1.5000** | **1.2910** | **4** |
| *Sebastes serranoides Adult* | 7/24/2003 | **0.5000** | **1.0000** | **4** |
| *Sebastes serranoides Adult* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/24/2003 | **0.5000** | **0.5774** | **4** |
| *Sebastes serranoides Juvenile* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Adult* | 7/24/2003 | **1.0000** | **1.4142** | **4** |
| *Sebastes atrovirens Adult* | 8/4/2003 | **0.5000** | **1.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/24/2003 | **3.2500** | **5.8523** | **4** |
| *Sebastes atrovirens Juvenile* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Adult* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/24/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Male* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/24/2003 | **1.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Female* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/24/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Adult* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/24/2003 | **0.2500** | **0.5000** | **4** |
| *Damalichthys vacca Adult* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Hypsypops rubicundus Adult* | 7/24/2003 | **0.2500** | **0.5000** | **4** |
| *Hypsypops rubicundus Adult* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 8/4/2003 | **0.2500** | **0.5000** | **4** |
| *Girella nigricans Juvenile* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 8/4/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 7/24/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/4/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Cruz Island - Fry's Harbor

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/21/2003 | **63.0000** | **19.8662** | **4** |
| *Chromis punctipinnis Adult* | 10/8/2003 | **23.0000** | **9.5618** | **8** |
| *Chromis punctipinnis Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 7/21/2003 | **0.5000** | **0.5774** | **4** |
| *Oxyjulis californica Adult* | 10/8/2003 | **0.6250** | **0.9161** | **8** |
| *Oxyjulis californica Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 10/8/2003 | **0.1250** | **0.3536** | **8** |
| *Sebastes mystinus Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 10/8/2003 | **0.1250** | **0.3536** | **8** |
| *Sebastes atrovirens Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Adult* | 7/21/2003 | **1.0000** | **1.4142** | **4** |
| *Paralabrax clathratus Adult* | 10/8/2003 | **0.2500** | **0.4629** | **8** |
| *Paralabrax clathratus Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Female* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 10/8/2003 | **0.2500** | **0.4629** | **8** |
| *Semicossyphus pulcher Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 10/8/2003 | **0.1250** | **0.3536** | **8** |
| *Embiotoca jacksoni Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Adult* | 7/21/2003 | **1.0000** | **0.8165** | **4** |
| *Damalichthys vacca Adult* | 10/8/2003 | **1.6250** | **0.7440** | **8** |
| *Damalichthys vacca Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 10/8/2003 | **0.8750** | **1.1260** | **8** |
| *Hypsypops rubicundus Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Juvenile* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 10/8/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 7/21/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 10/8/2003 | **0.0000** | **0.0000** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Cruz Island - Pelican Bay

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/22/2003 | **9.2500** | **10.7199** | **4** |
| *Chromis punctipinnis Adult* | 8/20/2003 | **10.5000** | **4.1231** | **4** |
| *Chromis punctipinnis Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/22/2003 | **0.2500** | **0.5000** | **4** |
| *Oxyjulis californica Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 8/20/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 7/22/2003 | **0.7500** | **1.5000** | **4** |
| *Paralabrax clathratus Adult* | 8/20/2003 | **2.2500** | **2.6300** | **4** |
| *Paralabrax clathratus Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/22/2003 | **2.7500** | **1.7078** | **4** |
| *Embiotoca jacksoni Adult* | 8/20/2003 | **2.0000** | **1.4142** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/20/2003 | **1.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 7/22/2003 | **1.7500** | **1.5000** | **4** |
| *Hypsypops rubicundus Adult* | 8/20/2003 | **0.7500** | **0.9574** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/22/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Male* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 7/22/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/20/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Cruz Island - Scorpion Anchorage

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 8/20/2003 | **9.5000** | **6.4550** | **4** |
| *Chromis punctipinnis Adult* | 9/26/2003 | **21.0000** | **19.4789** | **8** |
| *Chromis punctipinnis Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 9/26/2003 | **0.7500** | **0.7071** | **8** |
| *Oxyjulis californica Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Adult* | 8/20/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes serranoides Adult* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 9/26/2003 | **0.2500** | **0.4629** | **8** |
| *Sebastes atrovirens Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Female* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 8/20/2003 | **2.2500** | **0.9574** | **4** |
| *Embiotoca jacksoni Adult* | 9/26/2003 | **1.0000** | **0.9258** | **8** |
| *Embiotoca jacksoni Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Adult* | 8/20/2003 | **0.2500** | **0.5000** | **4** |
| *Hypsypops rubicundus Adult* | 9/26/2003 | **0.5000** | **0.5345** | **8** |
| *Hypsypops rubicundus Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/26/2003 | **0.1250** | **0.3536** | **8** |
| *Girella nigricans Juvenile* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/26/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 8/20/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/26/2003 | **0.5000** | **0.5345** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Cruz Island - Yellow Banks

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 8/7/2003 | **0.2500** | **0.5000** | **4** |
| *Chromis punctipinnis Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 8/7/2003 | **2.5000** | **3.1091** | **4** |
| *Oxyjulis californica Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/7/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 8/7/2003 | **0.5000** | **1.0000** | **4** |
| *Embiotoca jacksoni Adult* | 9/22/2003 | **0.5000** | **1.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/7/2003 | **0.5000** | **0.5774** | **4** |
| *Damalichthys vacca Adult* | 9/22/2003 | **0.2500** | **0.5000** | **4** |
| *Damalichthys vacca Juvenile* | 8/7/2003 | **0.2500** | **0.5000** | **4** |
| *Damalichthys vacca Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/22/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/7/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 9/22/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Anacapa Island - Admiral's Reef

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/10/2003 | **45.7500** | **61.3426** | **4** |
| *Chromis punctipinnis Adult* | 8/18/2003 | **79.2500** | **67.1634** | **4** |
| *Chromis punctipinnis Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 8/18/2003 | **5.7500** | **5.5603** | **4** |
| *Oxyjulis californica Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 8/18/2003 | **1.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/10/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Adult* | 8/18/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/18/2003 | **0.2500** | **0.5000** | **4** |
| *Damalichthys vacca Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 7/10/2003 | **0.7500** | **0.9574** | **4** |
| *Hypsypops rubicundus Adult* | 8/18/2003 | **0.7500** | **0.5000** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/10/2003 | **0.5000** | **0.5774** | **4** |
| *Girella nigricans Adult* | 8/18/2003 | **1.0000** | **0.8165** | **4** |
| *Girella nigricans Juvenile* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/18/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/10/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Male* | 8/18/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Female* | 7/10/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/18/2003 | **0.7500** | **0.9574** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Anacapa Island - Cathedral Cove

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/11/2003 | **62.5000** | **26.6396** | **4** |
| *Chromis punctipinnis Adult* | 7/25/2003 | **4.2500** | **6.6521** | **4** |
| *Chromis punctipinnis Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/11/2003 | **0.5000** | **1.0000** | **4** |
| *Oxyjulis californica Adult* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 7/11/2003 | **0.7500** | **1.5000** | **4** |
| *Sebastes serranoides Adult* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/25/2003 | **1.2500** | **1.5000** | **4** |
| *Sebastes atrovirens Adult* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 7/25/2003 | **0.7500** | **0.9574** | **4** |
| *Sebastes atrovirens Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 7/11/2003 | **0.5000** | **0.5774** | **4** |
| *Paralabrax clathratus Adult* | 7/25/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/11/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Female* | 7/25/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/25/2003 | **0.7500** | **0.9574** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 7/11/2003 | **1.0000** | **1.4142** | **4** |
| *Hypsypops rubicundus Adult* | 7/25/2003 | **1.7500** | **0.9574** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/11/2003 | **1.2500** | **1.2583** | **4** |
| *Girella nigricans Adult* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/11/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/25/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 7/11/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Female* | 7/25/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Anacapa Island - Landing Cove

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 8/8/2003 | **18.2500** | **15.4353** | **4** |
| *Chromis punctipinnis Adult* | 9/12/2003 | **16.5000** | **12.8712** | **4** |
| *Chromis punctipinnis Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 8/8/2003 | **2.0000** | **2.1602** | **4** |
| *Oxyjulis californica Adult* | 9/12/2003 | **1.0000** | **0.8165** | **4** |
| *Oxyjulis californica Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 9/12/2003 | **6.2500** | **12.5000** | **4** |
| *Sebastes mystinus Adult* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 9/12/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Adult* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 8/8/2003 | **1.2500** | **1.5000** | **4** |
| *Paralabrax clathratus Adult* | 9/12/2003 | **1.0000** | **0.8165** | **4** |
| *Paralabrax clathratus Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/8/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Male* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 9/12/2003 | **1.5000** | **1.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 8/8/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Adult* | 9/12/2003 | **1.2500** | **0.9574** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/8/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca lateralis Adult* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 8/8/2003 | **1.2500** | **0.9574** | **4** |
| *Hypsypops rubicundus Adult* | 9/12/2003 | **1.7500** | **2.8723** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 8/8/2003 | **1.0000** | **2.0000** | **4** |
| *Girella nigricans Adult* | 9/12/2003 | **2.0000** | **1.4142** | **4** |
| *Girella nigricans Juvenile* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 9/12/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 8/8/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 9/12/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Female* | 8/8/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Female* | 9/12/2003 | **0.5000** | **0.5774** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Barbara Island - SE Sea Lion Rookery

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/8/2003 | **6.7500** | **12.1758** | **4** |
| *Oxyjulis californica Adult* | 8/19/2003 | **0.2500** | **0.5000** | **4** |
| *Oxyjulis californica Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 7/8/2003 | **0.2500** | **0.5000** | **4** |
| *Hypsypops rubicundus Adult* | 8/19/2003 | **0.5000** | **0.5774** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 7/8/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/19/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Barbara Island - Arch Point

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/9/2003 | **72.5000** | **86.8428** | **4** |
| *Chromis punctipinnis Adult* | 8/19/2003 | **19.7500** | **13.5000** | **4** |
| *Chromis punctipinnis Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/9/2003 | **1.2500** | **1.5000** | **4** |
| *Oxyjulis californica Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 7/9/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/9/2003 | **0.5000** | **0.5774** | **4** |
| *Semicossyphus pulcher Female* | 8/19/2003 | **0.5000** | **0.5774** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 7/9/2003 | **4.0000** | **1.8257** | **4** |
| *Hypsypops rubicundus Adult* | 8/19/2003 | **1.5000** | **1.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/9/2003 | **2.2500** | **2.2174** | **4** |
| *Girella nigricans Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/19/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
Santa Barbara Island - Cat Canyon

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 7/9/2003 | **21.0000** | **8.7178** | **4** |
| *Chromis punctipinnis Adult* | 8/19/2003 | **5.2500** | **3.7749** | **4** |
| *Chromis punctipinnis Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 7/9/2003 | **11.7500** | **9.8784** | **4** |
| *Oxyjulis californica Adult* | 8/19/2003 | **5.2500** | **2.9861** | **4** |
| *Oxyjulis californica Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 8/19/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Adult* | 7/9/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 7/9/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Female* | 8/19/2003 | **0.2500** | **0.5000** | **4** |
| *Semicossyphus pulcher Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 7/9/2003 | **0.7500** | **0.9574** | **4** |
| *Hypsypops rubicundus Adult* | 8/19/2003 | **0.5000** | **0.5774** | **4** |
| *Hypsypops rubicundus Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 7/9/2003 | **2.5000** | **1.0000** | **4** |
| *Girella nigricans Adult* | 8/19/2003 | **0.2500** | **0.5000** | **4** |
| *Girella nigricans Juvenile* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 7/9/2003 | **0.2500** | **0.5000** | **4** |
| *Halichoeres semicinctus Male* | 8/19/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 7/9/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 8/19/2003 | **0.0000** | **0.0000** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
San Clemente Island - Northwest Harbor

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 5/30/2003 | **0.2500** | **0.4629** | **8** |
| *Chromis punctipinnis Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 5/30/2003 | **0.7500** | **1.0351** | **8** |
| *Oxyjulis californica Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Adult* | 5/30/2003 | **1.1250** | **0.6409** | **8** |
| *Paralabrax clathratus Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 5/30/2003 | **0.6250** | **0.7440** | **8** |
| *Semicossyphus pulcher Female* | 5/30/2003 | **2.7500** | **1.2817** | **8** |
| *Semicossyphus pulcher Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Adult* | 5/30/2003 | **0.5000** | **0.5345** | **8** |
| *Hypsypops rubicundus Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Juvenile* | 5/30/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 5/30/2003 | **0.2500** | **0.4629** | **8** |
| *Halichoeres semicinctus Female* | 5/30/2003 | **0.0000** | **0.0000** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
San Clemente Island - Boy Scout Camp

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 5/29/2003 | **3.2500** | **4.7170** | **4** |
| *Chromis punctipinnis Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 5/29/2003 | **1.5000** | **1.2910** | **4** |
| *Oxyjulis californica Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 5/29/2003 | **0.5000** | **1.0000** | **4** |
| *Sebastes atrovirens Juvenile* | 5/29/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Adult* | 5/29/2003 | **2.2500** | **1.5000** | **4** |
| *Paralabrax clathratus Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Female* | 5/29/2003 | **2.0000** | **0.8165** | **4** |
| *Semicossyphus pulcher Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca jacksoni Adult* | 5/29/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 5/29/2003 | **1.5000** | **0.5774** | **4** |
| *Hypsypops rubicundus Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 5/29/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 5/29/2003 | **1.0000** | **0.8165** | **4** |
| *Halichoeres semicinctus Female* | 5/29/2003 | **0.7500** | **0.9574** | **4** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
San Clemente Island - Eel Point

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Chromis punctipinnis Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Oxyjulis californica Adult* | 5/28/2003 | **1.6250** | **1.9226** | **8** |
| *Oxyjulis californica Juvenile* | 5/28/2003 | **0.2500** | **0.4629** | **8** |
| *Sebastes mystinus Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes mystinus Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes serranoides Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Sebastes atrovirens Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Paralabrax clathratus Adult* | 5/28/2003 | **2.1250** | **1.7269** | **8** |
| *Paralabrax clathratus Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Semicossyphus pulcher Male* | 5/28/2003 | **1.2500** | **0.8864** | **8** |
| *Semicossyphus pulcher Female* | 5/28/2003 | **3.8750** | **1.5526** | **8** |
| *Semicossyphus pulcher Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca jacksoni Adult* | 5/28/2003 | **0.7500** | **0.8864** | **8** |
| *Embiotoca jacksoni Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Embiotoca lateralis Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Damalichthys vacca Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Hypsypops rubicundus Adult* | 5/28/2003 | **0.3750** | **0.5175** | **8** |
| *Hypsypops rubicundus Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Adult* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Girella nigricans Juvenile* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Male* | 5/28/2003 | **0.0000** | **0.0000** | **8** |
| *Halichoeres semicinctus Female* | 5/28/2003 | **0.0000** | **0.0000** | **8** |

2003 FISH TRANSECT DATA: MEAN NUMBER PER TRANSECT (300 $M^3$)
San Clemente Island - Horse Beach Cove

| | Date | Mean | Std. Dev. | n |
|---|---|---|---|---|
| *Chromis punctipinnis Adult* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Chromis punctipinnis Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Oxyjulis californica Adult* | 6/1/2003 | **2.0000** | **2.1602** | **4** |
| *Oxyjulis californica Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Adult* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes mystinus Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Adult* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes serranoides Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Sebastes atrovirens Adult* | 6/1/2003 | **0.2500** | **0.5000** | **4** |
| *Sebastes atrovirens Juvenile* | 6/1/2003 | **0.2500** | **0.5000** | **4** |
| *Paralabrax clathratus Adult* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Paralabrax clathratus Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Semicossyphus pulcher Male* | 6/1/2003 | **0.5000** | **0.5774** | **4** |
| *Semicossyphus pulcher Female* | 6/1/2003 | **1.7500** | **0.9574** | **4** |
| *Semicossyphus pulcher Juvenile* | 6/1/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Adult* | 6/1/2003 | **0.2500** | **0.5000** | **4** |
| *Embiotoca jacksoni Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Adult* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Embiotoca lateralis Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Damalichthys vacca Adult* | 6/1/2003 | **0.2500** | **0.5000** | **4** |
| *Damalichthys vacca Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Hypsypops rubicundus Adult* | 6/1/2003 | **1.0000** | **0.8165** | **4** |
| *Hypsypops rubicundus Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Adult* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Girella nigricans Juvenile* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Male* | 6/1/2003 | **0.0000** | **0.0000** | **4** |
| *Halichoeres semicinctus Female* | 6/1/2003 | **0.5000** | **0.5774** | **4** |

## Appendix F: Roving Diver Fish



2003 ROVING DIVER FISH COUNT:

| Island: | Site Name: | Date: | Number of Observers: | Number of species |
|---|---|---|---|---|
| **San Miguel** | **Wyckoff Ledge** | **9/9/2003** | **4** | **24** |
| **San Miguel** | **Wyckoff Ledge** | **9/25/200** | **5** | **29** |
| **San Miguel** | **Hare Rock** | **9/11/200** | **4** | **24** |
| **San Miguel** | **Hare Rock** | **9/25/200** | **5** | **29** |
| **Santa Rosa** | **Johnson's Lee North** | **8/6/2003** | **5** | **28** |
| **Santa Rosa** | **Johnson's Lee North** | **9/23/200** | **4** | **27** |
| **Santa Rosa** | **Johnson's Lee South** | **8/5/2003** | **4** | **24** |
| **Santa Rosa** | **Johnson's Lee South** | **9/23/200** | **4** | **23** |
| **Santa Rosa** | **Rodes Reef** | **8/21/200** | **3** | **22** |
| **Santa Rosa** | **Rodes Reef** | **9/24/200** | **4** | **32** |
| **Santa Cruz** | **Gull Island South** | **7/24/200** | **4** | **27** |
| **Santa Cruz** | **Gull Island South** | **8/4/2003** | **5** | **24** |
| **Santa Cruz** | **Fry's Harbor** | **7/21/200** | **5** | **30** |
| **Santa Cruz** | **Fry's Harbor** | **10/8/200** | **4** | **33** |
| **Santa Cruz** | **Pelican Bay** | **7/22/200** | **6** | **23** |
| **Santa Cruz** | **Pelican Bay** | **8/20/200** | **6** | **21** |
| **Santa Cruz** | **Scorpion Anchorage** | **8/20/200** | **5** | **24** |
| **Santa Cruz** | **Scorpion Anchorage** | **9/26/200** | **5** | **23** |
| **Santa Cruz** | **Yellow Banks** | **8/7/2003** | **4** | **25** |
| **Santa Cruz** | **Yellow Banks** | **9/22/200** | **4** | **27** |
| **Anacapa** | **Admiral's Reef** | **7/10/200** | **6** | **23** |
| **Anacapa** | **Admiral's Reef** | **8/18/200** | **6** | **19** |
| **Anacapa** | **Cathedral Cove** | **7/11/200** | **7** | **24** |
| **Anacapa** | **Cathedral Cove** | **7/25/200** | **4** | **26** |
| **Anacapa** | **Landing Cove** | **8/8/2003** | **5** | **26** |
| **Anacapa** | **Landing Cove** | **9/12/200** | **4** | **28** |
| **Santa Barbara** | **SE Sea Lion** | **7/8/2003** | **5** | **20** |
| **Santa Barbara** | **SE Sea Lion** | **8/19/200** | **4** | **20** |
| **Santa Barbara** | **Arch Point** | **7/9/2003** | **4** | **16** |
| **Santa Barbara** | **Arch Point** | **8/19/200** | **6** | **17** |
| **Santa Barbara** | **Cat Canyon** | **7/9/2003** | **4** | **18** |
| **Santa Barbara** | **Cat Canyon** | **8/19/200** | **4** | **17** |
| **San Clemente** | **Northwest Harbor** | **5/30/200** | **6** | **10** |
| **San Clemente** | **Boy Scout Camp** | **5/29/200** | **6** | **18** |
| **San Clemente** | **Eel Point** | **5/28/200** | **6** | **14** |
| **San Clemente** | **Horse Beach Cove** | **6/1/2003** | **7** | **21** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 9/9/2003 | **4** | **4** | **8.75** | **0.96** | **2.00** | **0.00** |
| **black and yellow rockfish** | 9/25/2003 | **5** | **5** | **8.60** | **1.52** | **2.20** | **0.45** |
| **black rockfish** | 9/25/2003 | **5** | **2** | **10.00** | **0.00** | **1.00** | **0.00** |
| **black surfperch, adult** | 9/9/2003 | **4** | **4** | **3.25** | **3.95** | **0.75** | **0.96** |
| **black surfperch, adult** | 9/25/2003 | **5** | **5** | **3.60** | **4.93** | **0.60** | **0.89** |
| **black surfperch, all** | 9/9/2003 | **4** | **4** | **3.25** | **3.95** | **0.75** | **0.96** |
| **black surfperch, all** | 9/25/2003 | **5** | **5** | **8.60** | **2.07** | **1.80** | **0.45** |
| **black surfperch, juvenile** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 9/25/2003 | **5** | **5** | **8.60** | **2.07** | **1.60** | **0.55** |
| **blackeye goby** | 9/9/2003 | **4** | **4** | **7.00** | **4.69** | **1.25** | **0.96** |
| **blackeye goby** | 9/25/2003 | **5** | **5** | **9.40** | **0.55** | **2.00** | **0.00** |
| **blacksmith, adult** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, adult** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, all** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, all** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 9/9/2003 | **4** | **4** | **7.75** | **1.50** | **3.00** | **0.00** |
| **blue rockfish, adult** | 9/25/2003 | **5** | **5** | **8.40** | **1.34** | **2.40** | **0.55** |
| **blue rockfish, all** | 9/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blue rockfish, all** | 9/25/2003 | **5** | **5** | **9.20** | **1.30** | **2.60** | **0.55** |
| **blue rockfish, juvenile** | 9/9/2003 | **4** | **4** | **10.00** | **0.00** | **2.25** | **0.50** |
| **blue rockfish, juvenile** | 9/25/2003 | **5** | **5** | **7.80** | **4.38** | **1.40** | **0.89** |
| **blue-banded goby** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **bocaccio, juvenile** | 9/9/2003 | **4** | **3** | **6.67** | **1.53** | **2.00** | **1.73** |
| **bocaccio, juvenile** | 9/25/2003 | **5** | **4** | **9.25** | **0.96** | **2.25** | **0.96** |
| **cabezon** | 9/25/2003 | **5** | **2** | **8.50** | **2.12** | **1.00** | **0.00** |
| **California sheephead,** | 9/9/2003 | **4** | **4** | **5.75** | **4.19** | **1.25** | **0.96** |
| **California sheephead,** | 9/25/2003 | **5** | **5** | **6.60** | **3.97** | **1.00** | **0.71** |
| **California sheephead,** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/9/2003 | **4** | **4** | **4.25** | **5.06** | **0.50** | **0.58** |
| **California sheephead,** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **copper rockfish** | 9/9/2003 | **4** | **3** | **7.33** | **2.31** | **1.67** | **0.58** |
| **copper rockfish** | 9/25/2003 | **5** | **4** | **8.25** | **1.71** | **1.75** | **0.50** |
| **garibaldi, adult** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, adult** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher rockfish** | 9/25/2003 | **5** | **2** | **9.00** | **0.00** | **1.00** | **0.00** |
| **gopher/copper rockfish,** | 9/9/2003 | **4** | **3** | **9.00** | **1.00** | **2.00** | **0.00** |
| **gopher/copper rockfish,** | 9/25/2003 | **5** | **5** | **8.80** | **1.10** | **2.20** | **0.45** |
| **island kelpfish** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, calico bass, all** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, calico bass, all** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp greenling** | 9/25/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **kelp rockfish, adult** | 9/9/2003 | **4** | **4** | **8.25** | **1.71** | **2.00** | **0.00** |
| **kelp rockfish, adult** | 9/25/2003 | **5** | **5** | **9.60** | **0.55** | **2.20** | **0.45** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, all** | 9/9/2003 | **4** | **4** | **8.50** | **1.91** | **2.25** | **0.50** |
| **kelp rockfish, all** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **3.00** | **0.00** |
| **kelp rockfish, juvenile** | 9/9/2003 | **4** | **4** | **6.50** | **4.43** | **1.50** | **1.29** |
| **kelp rockfish, juvenile** | 9/25/2003 | **5** | **5** | **9.40** | **0.89** | **3.00** | **0.00** |
| **kelpfish spp.** | 9/9/2003 | **4** | **2** | **9.00** | **1.41** | **1.50** | **0.71** |
| **kelpfish spp.** | 9/25/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **lingcod** | 9/9/2003 | **4** | **3** | **9.33** | **0.58** | **1.33** | **0.58** |
| **lingcod** | 9/25/2003 | **5** | **5** | **9.20** | **0.84** | **2.00** | **0.00** |
| **olive rockfish, adult** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 9/25/2003 | **5** | **5** | **3.00** | **4.12** | **0.40** | **0.55** |
| **olive rockfish, all** | 9/9/2003 | **4** | **4** | **5.25** | **3.59** | **1.25** | **0.96** |
| **olive rockfish, all** | 9/25/2003 | **5** | **5** | **9.00** | **0.71** | **2.00** | **0.00** |
| **olive/yellowtail rockfish,** | 9/9/2003 | **4** | **4** | **5.25** | **3.59** | **1.25** | **0.96** |
| **olive/yellowtail rockfish,** | 9/25/2003 | **5** | **5** | **9.00** | **0.71** | **1.80** | **0.45** |
| **opaleye, adult** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/25/2003 | **5** | **5** | **2.00** | **4.47** | **0.20** | **0.45** |
| **opaleye, all** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/25/2003 | **5** | **5** | **2.00** | **4.47** | **0.20** | **0.45** |
| **opaleye, juvenile** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 9/9/2003 | **4** | **4** | **9.75** | **0.50** | **2.25** | **0.50** |
| **painted greenling** | 9/25/2003 | **5** | **5** | **9.60** | **0.55** | **3.00** | **0.00** |
| **pile surfperch, adult** | 9/9/2003 | **4** | **4** | **6.00** | **4.24** | **1.25** | **0.96** |
| **pile surfperch, adult** | 9/25/2003 | **5** | **5** | **8.40** | **1.95** | **1.60** | **0.55** |
| **pile surfperch, all** | 9/9/2003 | **4** | **4** | **8.50** | **1.29** | **1.75** | **0.50** |
| **pile surfperch, all** | 9/25/2003 | **5** | **5** | **8.60** | **1.52** | **1.80** | **0.45** |
| **pile surfperch, juvenile** | 9/9/2003 | **4** | **4** | **6.75** | **4.57** | **1.25** | **0.96** |
| **pile surfperch, juvenile** | 9/25/2003 | **5** | **5** | **6.00** | **3.67** | **1.20** | **0.84** |
| **rainbow surfperch** | 9/9/2003 | **4** | **1** | **10.00** | | **1.00** | |
| **rainbow surfperch** | 9/25/2003 | **5** | **3** | **9.00** | **0.00** | **2.00** | **0.00** |
| **rock wrasse, female** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **sculpin spp.** | 9/25/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **senorita, adult** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, adult** | 9/25/2003 | **5** | **5** | **3.20** | **4.38** | **0.60** | **0.89** |
| **senorita, all** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, all** | 9/25/2003 | **5** | **5** | **3.20** | **4.38** | **0.60** | **0.89** |
| **senorita, juvenile** | 9/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 9/9/2003 | **4** | **1** | **7.00** | | **2.00** | |
| **snubnose sculpin** | 9/25/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **speckled sanddab** | 9/9/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **striped surfperch, adult** | 9/9/2003 | **4** | **4** | **8.25** | **1.71** | **2.75** | **0.50** |
| **striped surfperch, adult** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **2.60** | **0.55** |
| **striped surfperch, all** | 9/9/2003 | **4** | **4** | **8.25** | **1.71** | **2.75** | **0.50** |
| **striped surfperch, all** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **2.80** | **0.45** |
| **striped surfperch, juvenile** | 9/9/2003 | **4** | **4** | **4.50** | **5.26** | **0.75** | **0.96** |
| **striped surfperch, juvenile** | 9/25/2003 | **5** | **5** | **5.40** | **4.98** | **1.20** | **1.10** |
| **surfperch spp.** | 9/25/2003 | **5** | **4** | **7.50** | **1.00** | **2.50** | **1.00** |
| **treefish, adult** | 9/9/2003 | **4** | **4** | **4.00** | **4.69** | **0.75** | **0.96** |
| **treefish, adult** | 9/25/2003 | **5** | **5** | **6.40** | **1.67** | **1.20** | **0.45** |
| **treefish, juvenile** | 9/9/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **treefish, juvenile** | 9/25/2003 | **5** | **5** | **1.20** | **2.68** | **0.20** | **0.45** |
| **tubesnout** | 9/9/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **tubesnout** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **4.00** | **0.00** |
| **vermillion rockfish** | 9/9/2003 | **4** | **2** | **7.50** | **2.12** | **2.00** | **0.00** |

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|---|---|---|---|---|---|---|---|
| **vermillion rockfish** | 9/25/2003 | **5** | **4** | **8.50** | **1.73** | **1.25** | **0.50** |
| **white surfperch** | 9/9/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **yellowfin fringehead** | 9/9/2003 | **4** | **1** | **8.00** | | **2.00** | |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 9/11/2003 | **4** | **4** | **9.00** | **0.00** | **2.00** | **0.00** |
| **black and yellow rockfish** | 9/25/2003 | **5** | **5** | **8.00** | **1.41** | **1.80** | **0.45** |
| **black rockfish** | 9/25/2003 | **5** | **1** | **9.00** | | **2.00** | |
| **black surfperch, adult** | 9/11/2003 | **4** | **4** | **7.50** | **1.73** | **2.00** | **0.00** |
| **black surfperch, adult** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **2.00** | **0.00** |
| **black surfperch, all** | 9/11/2003 | **4** | **4** | **8.00** | **1.41** | **2.00** | **0.00** |
| **black surfperch, all** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **2.20** | **0.45** |
| **black surfperch, juvenile** | 9/11/2003 | **4** | **4** | **5.25** | **3.59** | **1.00** | **0.82** |
| **black surfperch, juvenile** | 9/25/2003 | **5** | **5** | **3.00** | **4.47** | **0.60** | **0.89** |
| **blackeye goby** | 9/11/2003 | **4** | **4** | **9.00** | **0.82** | **2.50** | **0.58** |
| **blackeye goby** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **3.00** | **0.00** |
| **blacksmith, adult** | 9/11/2003 | **4** | **4** | **6.00** | **4.24** | **1.25** | **0.96** |
| **blacksmith, adult** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **2.80** | **0.45** |
| **blacksmith, all** | 9/11/2003 | **4** | **4** | **6.00** | **4.24** | **1.25** | **0.96** |
| **blacksmith, all** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **2.80** | **0.45** |
| **blacksmith, juvenile** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 9/11/2003 | **4** | **4** | **8.25** | **1.50** | **3.00** | **0.00** |
| **blue rockfish, adult** | 9/25/2003 | **5** | **5** | **7.60** | **4.28** | **2.20** | **1.30** |
| **blue rockfish, all** | 9/11/2003 | **4** | **4** | **9.25** | **0.50** | **3.00** | **0.00** |
| **blue rockfish, all** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blue rockfish, juvenile** | 9/11/2003 | **4** | **4** | **9.25** | **0.50** | **2.75** | **0.50** |
| **blue rockfish, juvenile** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blue-banded goby** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **bocaccio, juvenile** | 9/11/2003 | **4** | **2** | **7.50** | **2.12** | **1.50** | **0.71** |
| **bocaccio, juvenile** | 9/25/2003 | **5** | **2** | **10.00** | **0.00** | **1.50** | **0.71** |
| **cabezon** | 9/11/2003 | **4** | **1** | **10.00** | | **1.00** | |
| **cabezon** | 9/25/2003 | **5** | **3** | **7.67** | **0.58** | **1.00** | **0.00** |
| **cabezon, juvenile** | 9/25/2003 | **5** | **1** | **9.00** | | **2.00** | |
| **California sheephead,** | 9/11/2003 | **4** | **4** | **7.75** | **1.50** | **2.00** | **0.00** |
| **California sheephead,** | 9/25/2003 | **5** | **5** | **9.60** | **0.55** | **1.60** | **0.55** |
| **California sheephead,** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/11/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **California sheephead,** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **copper rockfish** | 9/11/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **copper rockfish** | 9/25/2003 | **5** | **1** | **8.00** | | **2.00** | |
| **coralline sculpin** | 9/11/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **garibaldi, adult** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, adult** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish, juvenile** | 9/11/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **gopher rockfish** | 9/25/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **gopher/copper rockfish,** | 9/11/2003 | **4** | **4** | **8.25** | **1.71** | **1.75** | **0.50** |
| **gopher/copper rockfish,** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **2.80** | **0.45** |
| **island kelpfish** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 9/25/2003 | **5** | **5** | **2.00** | **4.47** | **0.20** | **0.45** |
| **kelp bass, adult** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, calico bass, all** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, calico bass, all** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp bass, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 9/11/2003 | **4** | **4** | **8.75** | **0.50** | **2.00** | **0.00** |
| **kelp rockfish, adult** | 9/25/2003 | **5** | **5** | **7.20** | **4.15** | **1.60** | **0.89** |
| **kelp rockfish, all** | 9/11/2003 | **4** | **4** | **8.75** | **0.50** | **2.00** | **0.00** |
| **kelp rockfish, all** | 9/25/2003 | **5** | **5** | **8.60** | **1.34** | **1.80** | **0.45** |
| **kelp rockfish, juvenile** | 9/11/2003 | **4** | **4** | **1.75** | **3.50** | **0.50** | **1.00** |
| **kelp rockfish, juvenile** | 9/25/2003 | **5** | **5** | **3.40** | **4.77** | **0.60** | **0.89** |
| **kelpfish spp.** | 9/11/2003 | **4** | **2** | **9.00** | **0.00** | **1.50** | **0.71** |
| **lingcod** | 9/11/2003 | **4** | **1** | **8.00** | | **2.00** | |
| **lingcod** | 9/25/2003 | **5** | **1** | **5.00** | | **1.00** | |
| **olive rockfish, adult** | 9/11/2003 | **4** | **4** | **8.00** | **1.83** | **1.25** | **0.50** |
| **olive rockfish, adult** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **1.80** | **0.45** |
| **olive rockfish, all** | 9/11/2003 | **4** | **4** | **9.50** | **0.58** | **2.00** | **0.00** |
| **olive rockfish, all** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **2.40** | **0.55** |
| **olive/yellowtail rockfish,** | 9/11/2003 | **4** | **4** | **6.50** | **4.51** | **1.50** | **1.00** |
| **olive/yellowtail rockfish,** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **2.40** | **0.55** |
| **opaleye, adult** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 9/11/2003 | **4** | **4** | **9.25** | **0.96** | **2.00** | **0.00** |
| **painted greenling** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **pile surfperch, adult** | 9/11/2003 | **4** | **4** | **7.75** | **1.50** | **2.00** | **0.00** |
| **pile surfperch, adult** | 9/25/2003 | **5** | **5** | **9.00** | **0.71** | **2.40** | **0.55** |
| **pile surfperch, all** | 9/11/2003 | **4** | **4** | **7.75** | **1.50** | **2.00** | **0.00** |
| **pile surfperch, all** | 9/25/2003 | **5** | **5** | **9.00** | **0.71** | **2.40** | **0.55** |
| **pile surfperch, juvenile** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 9/25/2003 | **5** | **5** | **3.00** | **4.12** | **0.40** | **0.55** |
| **rainbow surfperch** | 9/25/2003 | **5** | **1** | **8.00** | | **1.00** | |
| **rock wrasse, female** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **ronquil spp.** | 9/25/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **rubberlip surfperch** | 9/25/2003 | **5** | **1** | **9.00** | | **1.00** | |
| **sculpin spp.** | 9/25/2003 | **5** | **2** | **7.00** | **1.41** | **1.50** | **0.71** |
| **senorita, adult** | 9/11/2003 | **4** | **4** | **9.25** | **1.50** | **3.25** | **0.50** |
| **senorita, adult** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **3.20** | **0.45** |
| **senorita, all** | 9/11/2003 | **4** | **4** | **9.25** | **1.50** | **3.25** | **0.50** |
| **senorita, all** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **3.20** | **0.45** |
| **senorita, juvenile** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 9/25/2003 | **5** | **3** | **7.33** | **1.15** | **1.33** | **0.58** |
| **striped surfperch, adult** | 9/11/2003 | **4** | **4** | **9.50** | **1.00** | **2.50** | **0.58** |
| **striped surfperch, adult** | 9/25/2003 | **5** | **5** | **9.80** | **0.45** | **3.00** | **0.00** |
| **striped surfperch, all** | 9/11/2003 | **4** | **4** | **9.50** | **1.00** | **2.75** | **0.50** |
| **striped surfperch, all** | 9/25/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **striped surfperch, juvenile** | 9/11/2003 | **4** | **4** | **7.50** | **5.00** | **1.75** | **1.26** |
| **striped surfperch, juvenile** | 9/25/2003 | **5** | **5** | **7.60** | **4.34** | **1.60** | **0.89** |
| **stripedfin ronquil** | 9/25/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **top smelt** | 9/25/2003 | **5** | **2** | **7.00** | **2.83** | **2.50** | **0.71** |
| **treefish, adult** | 9/11/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 9/25/2003 | **5** | **5** | **2.80** | **3.90** | **0.40** | **0.55** |
| **treefish, juvenile** | 9/11/2003 | **4** | **4** | **4.00** | **4.69** | **0.50** | **0.58** |
| **treefish, juvenile** | 9/25/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **tubesnout** | 9/11/2003 | **4** | **2** | **9.00** | **1.41** | **3.00** | **0.00** |

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|---|---|---|---|---|---|
| **white surfperch** | 9/11/2003 | **4** | **1** | **10.00** | **3.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 8/6/2003 | **5** | **3** | **7.67** | **1.53** | **1.67** | **0.58** |
| **black and yellow rockfish** | 9/23/2003 | **4** | **4** | **8.00** | **1.63** | **1.25** | **0.50** |
| **black surfperch, adult** | 8/6/2003 | **5** | **5** | **9.80** | **0.45** | **2.60** | **0.55** |
| **black surfperch, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **black surfperch, all** | 8/6/2003 | **5** | **5** | **9.80** | **0.45** | **2.60** | **0.55** |
| **black surfperch, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **black surfperch, juvenile** | 8/6/2003 | **5** | **5** | **1.40** | **3.13** | **0.40** | **0.89** |
| **black surfperch, juvenile** | 9/23/2003 | **4** | **4** | **9.00** | **2.00** | **2.25** | **0.50** |
| **blackeye goby** | 8/6/2003 | **5** | **5** | **9.40** | **0.89** | **2.60** | **0.55** |
| **blackeye goby** | 9/23/2003 | **4** | **4** | **9.25** | **0.96** | **2.50** | **0.58** |
| **blacksmith, adult** | 8/6/2003 | **5** | **5** | **9.40** | **1.34** | **2.80** | **0.45** |
| **blacksmith, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blacksmith, all** | 8/6/2003 | **5** | **5** | **9.40** | **1.34** | **2.80** | **0.45** |
| **blacksmith, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blacksmith, juvenile** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/6/2003 | **5** | **5** | **8.80** | **1.64** | **2.00** | **0.00** |
| **blue rockfish, adult** | 9/23/2003 | **4** | **4** | **8.75** | **1.89** | **2.00** | **0.00** |
| **blue rockfish, all** | 8/6/2003 | **5** | **5** | **9.60** | **0.55** | **2.60** | **0.55** |
| **blue rockfish, all** | 9/23/2003 | **4** | **4** | **9.00** | **1.41** | **2.75** | **0.50** |
| **blue rockfish, juvenile** | 8/6/2003 | **5** | **5** | **7.00** | **4.12** | **1.60** | **0.89** |
| **blue rockfish, juvenile** | 9/23/2003 | **4** | **4** | **8.50** | **1.29** | **2.25** | **0.50** |
| **blue-banded goby** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **bocaccio, juvenile** | 9/23/2003 | **4** | **1** | **7.00** | | **3.00** | |
| **California sheephead,** | 8/6/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **California sheephead,** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.25** | **0.50** |
| **California sheephead,** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/6/2003 | **5** | **5** | **2.60** | **3.58** | **0.60** | **0.89** |
| **California sheephead,** | 9/23/2003 | **4** | **4** | **5.00** | **5.77** | **1.00** | **1.15** |
| **copper rockfish** | 8/6/2003 | **5** | **1** | **9.00** | | **1.00** | |
| **copper rockfish** | 9/23/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **garibaldi, adult** | 8/6/2003 | **5** | **5** | **8.00** | **1.73** | **1.80** | **0.45** |
| **garibaldi, adult** | 9/23/2003 | **4** | **4** | **8.25** | **1.26** | **2.00** | **0.00** |
| **garibaldi, juvenile** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher rockfish** | 8/6/2003 | **5** | **2** | **7.50** | **3.54** | **1.00** | **0.00** |
| **gopher/copper rockfish,** | 8/6/2003 | **5** | **4** | **8.75** | **1.89** | **2.50** | **1.00** |
| **gopher/copper rockfish,** | 9/23/2003 | **4** | **4** | **9.25** | **0.50** | **1.75** | **0.50** |
| **halfmoon** | 9/23/2003 | **4** | **2** | **6.50** | **2.12** | **2.00** | **0.00** |
| **island kelpfish** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 8/6/2003 | **5** | **5** | **1.20** | **2.68** | **0.40** | **0.89** |
| **kelp bass, adult** | 9/23/2003 | **4** | **4** | **3.50** | **4.12** | **0.75** | **0.96** |
| **kelp bass, calico bass, all** | 8/6/2003 | **5** | **5** | **1.20** | **2.68** | **0.40** | **0.89** |
| **kelp bass, calico bass, all** | 9/23/2003 | **4** | **4** | **3.50** | **4.12** | **0.75** | **0.96** |
| **kelp bass, juvenile** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/6/2003 | **5** | **5** | **9.40** | **1.34** | **2.60** | **0.55** |
| **kelp rockfish, adult** | 9/23/2003 | **4** | **4** | **9.25** | **0.50** | **2.50** | **0.58** |
| **kelp rockfish, all** | 8/6/2003 | **5** | **5** | **9.40** | **1.34** | **2.80** | **0.45** |
| **kelp rockfish, all** | 9/23/2003 | **4** | **4** | **9.25** | **0.50** | **2.50** | **0.58** |
| **kelp rockfish, juvenile** | 8/6/2003 | **5** | **5** | **2.00** | **4.47** | **0.20** | **0.45** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp surfperch** | 8/6/2003 | **5** | **1** | **6.00** | | **2.00** | |
| **kelp surfperch** | 9/23/2003 | **4** | **4** | **8.50** | **2.38** | **2.50** | **0.58** |
| **kelpfish spp.** | 9/23/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **lingcod** | 8/6/2003 | **5** | **2** | **7.00** | **0.00** | **1.00** | **0.00** |
| **lingcod** | 9/23/2003 | **4** | **2** | **7.00** | **2.83** | **1.50** | **0.71** |
| **ocean whitefish** | 8/6/2003 | **5** | **2** | **6.50** | **2.12** | **1.50** | **0.71** |
| **olive rockfish, adult** | 8/6/2003 | **5** | **5** | **5.80** | **5.31** | **1.00** | **1.00** |
| **olive rockfish, adult** | 9/23/2003 | **4** | **4** | **7.00** | **1.41** | **2.00** | **0.00** |
| **olive rockfish, all** | 8/6/2003 | **5** | **5** | **9.80** | **0.45** | **2.00** | **0.71** |
| **olive rockfish, all** | 9/23/2003 | **4** | **4** | **7.75** | **0.50** | **2.75** | **0.50** |
| **olive/yellowtail rockfish,** | 8/6/2003 | **5** | **5** | **5.00** | **5.00** | **1.20** | **1.30** |
| **olive/yellowtail rockfish,** | 9/23/2003 | **4** | **4** | **7.50** | **0.58** | **2.50** | **1.00** |
| **opaleye, adult** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/23/2003 | **4** | **4** | **8.00** | **1.41** | **1.75** | **0.50** |
| **opaleye, all** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/23/2003 | **4** | **4** | **8.00** | **1.41** | **1.75** | **0.50** |
| **opaleye, juvenile** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 8/6/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **painted greenling** | 9/23/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **pile surfperch, adult** | 8/6/2003 | **5** | **5** | **8.40** | **2.30** | **2.20** | **0.45** |
| **pile surfperch, adult** | 9/23/2003 | **4** | **4** | **7.50** | **5.00** | **1.50** | **1.00** |
| **pile surfperch, all** | 8/6/2003 | **5** | **5** | **8.40** | **2.30** | **2.20** | **0.45** |
| **pile surfperch, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.00** | **0.00** |
| **pile surfperch, juvenile** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.00** | **0.00** |
| **rainbow surfperch** | 8/6/2003 | **5** | **1** | **7.00** | | **3.00** | |
| **rainbow surfperch** | 9/23/2003 | **4** | **3** | **10.00** | **0.00** | **3.00** | **0.00** |
| **rock wrasse, female** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/23/2003 | **4** | **4** | **1.25** | **2.50** | **0.50** | **1.00** |
| **rockfish spp., juvenile** | 8/6/2003 | **5** | **1** | **6.00** | | **2.00** | |
| **rubberlip surfperch** | 8/6/2003 | **5** | **3** | **6.67** | **2.08** | **1.67** | **0.58** |
| **sculpin spp.** | 8/6/2003 | **5** | **1** | **8.00** | | **1.00** | |
| **sculpin spp.** | 9/23/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **senorita, adult** | 8/6/2003 | **5** | **5** | **5.60** | **5.18** | **1.20** | **1.10** |
| **senorita, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **senorita, all** | 8/6/2003 | **5** | **5** | **5.60** | **5.18** | **1.20** | **1.10** |
| **senorita, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **senorita, juvenile** | 8/6/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 8/6/2003 | **5** | **3** | **6.00** | **1.00** | **1.33** | **0.58** |
| **striped surfperch, adult** | 8/6/2003 | **5** | **5** | **10.00** | **0.00** | **2.80** | **0.45** |
| **striped surfperch, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **striped surfperch, all** | 8/6/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **striped surfperch, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **striped surfperch, juvenile** | 8/6/2003 | **5** | **5** | **4.60** | **4.56** | **1.00** | **1.00** |
| **striped surfperch, juvenile** | 9/23/2003 | **4** | **4** | **7.00** | **4.69** | **1.50** | **1.00** |
| **swell shark** | 8/6/2003 | **5** | **3** | **8.00** | **2.65** | **1.00** | **0.00** |
| **treefish, adult** | 8/6/2003 | **5** | **5** | **2.40** | **3.29** | **0.40** | **0.55** |
| **treefish, adult** | 9/23/2003 | **4** | **4** | **5.25** | **3.77** | **1.00** | **0.82** |
| **treefish, juvenile** | 8/6/2003 | **5** | **5** | **8.20** | **1.64** | **1.60** | **0.55** |
| **treefish, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |

Santa Rosa Island - Johnson's Lee South

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **bat ray** | 9/23/2003 | **4** | **3** | **8.33** | **2.08** | **1.00** | **0.00** |
| **black and yellow rockfish** | 8/5/2003 | **4** | **4** | **7.50** | **1.29** | **1.75** | **0.50** |
| **black and yellow rockfish** | 9/23/2003 | **4** | **4** | **8.50** | **1.29** | **1.75** | **0.50** |
| **black surfperch, adult** | 8/5/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **black surfperch, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **black surfperch, all** | 8/5/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **black surfperch, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **black surfperch, juvenile** | 8/5/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **black surfperch, juvenile** | 9/23/2003 | **4** | **4** | **3.75** | **4.79** | **0.75** | **0.96** |
| **blackeye goby** | 8/5/2003 | **4** | **4** | **9.00** | **1.15** | **2.75** | **0.50** |
| **blackeye goby** | 9/23/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **blacksmith, adult** | 8/5/2003 | **4** | **4** | **6.25** | **4.35** | **2.00** | **1.41** |
| **blacksmith, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blacksmith, all** | 8/5/2003 | **4** | **4** | **6.25** | **4.35** | **2.00** | **1.41** |
| **blacksmith, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blacksmith, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/5/2003 | **4** | **4** | **8.50** | **1.73** | **2.75** | **0.50** |
| **blue rockfish, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blue rockfish, all** | 8/5/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **blue rockfish, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blue rockfish, juvenile** | 8/5/2003 | **4** | **4** | **9.25** | **0.50** | **2.50** | **0.58** |
| **blue rockfish, juvenile** | 9/23/2003 | **4** | **4** | **9.00** | **0.82** | **2.00** | **0.82** |
| **blue-banded goby** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **cabezon** | 8/5/2003 | **4** | **3** | **8.67** | **0.58** | **1.00** | **0.00** |
| **cabezon, juvenile** | 8/5/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **California sheephead,** | 8/5/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **California sheephead,** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **California sheephead,** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/23/2003 | **4** | **4** | **6.50** | **4.73** | **1.50** | **1.00** |
| **coralline sculpin** | 8/5/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **garibaldi, adult** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, adult** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher/copper rockfish,** | 8/5/2003 | **4** | **3** | **9.33** | **1.15** | **2.00** | **0.00** |
| **gopher/copper rockfish,** | 9/23/2003 | **4** | **2** | **10.00** | **0.00** | **2.00** | **0.00** |
| **halfmoon** | 9/23/2003 | **4** | **3** | **6.67** | **2.08** | **1.67** | **0.58** |
| **island kelpfish** | 8/5/2003 | **4** | **4** | **2.25** | **4.50** | **0.25** | **0.50** |
| **island kelpfish** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 8/5/2003 | **4** | **4** | **3.75** | **4.79** | **0.75** | **0.96** |
| **kelp bass, adult** | 9/23/2003 | **4** | **4** | **7.00** | **4.69** | **1.50** | **1.00** |
| **kelp bass, calico bass, all** | 8/5/2003 | **4** | **4** | **3.75** | **4.79** | **0.75** | **0.96** |
| **kelp bass, calico bass, all** | 9/23/2003 | **4** | **4** | **7.00** | **4.69** | **1.50** | **1.00** |
| **kelp bass, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/5/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **kelp rockfish, adult** | 9/23/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **kelp rockfish, all** | 8/5/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **kelp rockfish, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **kelp rockfish, juvenile** | 8/5/2003 | **4** | **4** | **3.75** | **4.50** | **1.00** | **1.15** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, juvenile** | 9/23/2003 | **4** | **4** | **8.75** | **1.89** | **1.75** | **0.96** |
| **lingcod** | 8/5/2003 | **4** | **2** | **7.00** | **2.83** | **1.00** | **0.00** |
| **lingcod** | 9/23/2003 | **4** | **1** | **6.00** | | **2.00** | |
| **ocean whitefish** | 9/23/2003 | **4** | **3** | **7.00** | **1.73** | **1.67** | **0.58** |
| **olive rockfish, adult** | 8/5/2003 | **4** | **4** | **7.75** | **2.63** | **1.75** | **0.50** |
| **olive rockfish, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.00** | **0.00** |
| **olive rockfish, all** | 8/5/2003 | **4** | **4** | **8.75** | **1.50** | **2.50** | **0.58** |
| **olive rockfish, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **olive/yellowtail rockfish,** | 8/5/2003 | **4** | **4** | **7.50** | **2.08** | **2.25** | **0.50** |
| **olive/yellowtail rockfish,** | 9/23/2003 | **4** | **4** | **9.25** | **0.96** | **2.00** | **0.00** |
| **opaleye, adult** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/23/2003 | **4** | **4** | **6.75** | **4.50** | **1.50** | **1.00** |
| **opaleye, all** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/23/2003 | **4** | **4** | **6.75** | **4.50** | **1.50** | **1.00** |
| **opaleye, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 8/5/2003 | **4** | **4** | **7.00** | **2.16** | **2.00** | **0.00** |
| **painted greenling** | 9/23/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **pile surfperch, adult** | 8/5/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **pile surfperch, adult** | 9/23/2003 | **4** | **4** | **8.75** | **0.96** | **2.25** | **0.50** |
| **pile surfperch, all** | 8/5/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **pile surfperch, all** | 9/23/2003 | **4** | **4** | **9.00** | **0.82** | **2.25** | **0.50** |
| **pile surfperch, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 9/23/2003 | **4** | **4** | **4.25** | **4.92** | **0.75** | **0.96** |
| **rainbow surfperch** | 9/23/2003 | **4** | **2** | **10.00** | **0.00** | **2.50** | **0.71** |
| **rock wrasse, female** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rockfish spp., juvenile** | 8/5/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **rubberlip surfperch** | 8/5/2003 | **4** | **4** | **10.00** | **0.00** | **2.00** | **0.82** |
| **rubberlip surfperch** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **senorita, adult** | 8/5/2003 | **4** | **4** | **1.25** | **2.50** | **0.75** | **1.50** |
| **senorita, adult** | 9/23/2003 | **4** | **4** | **7.50** | **5.00** | **1.75** | **1.50** |
| **senorita, all** | 8/5/2003 | **4** | **4** | **1.25** | **2.50** | **0.75** | **1.50** |
| **senorita, all** | 9/23/2003 | **4** | **4** | **7.50** | **5.00** | **1.75** | **1.50** |
| **senorita, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 8/5/2003 | **4** | **1** | **8.00** | | **2.00** | |
| **striped surfperch, adult** | 8/5/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **striped surfperch, adult** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **striped surfperch, all** | 8/5/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **striped surfperch, all** | 9/23/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **striped surfperch, juvenile** | 8/5/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **striped surfperch, juvenile** | 9/23/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **swell shark** | 8/5/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **treefish, adult** | 8/5/2003 | **4** | **4** | **3.50** | **4.12** | **0.50** | **0.58** |
| **treefish, adult** | 9/23/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **treefish, juvenile** | 8/5/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 9/23/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 9/24/2003 | **4** | **3** | **8.00** | **0.00** | **1.00** | **0.00** |
| **black rockfish** | 9/24/2003 | **4** | **2** | **10.00** | **0.00** | **1.50** | **0.71** |
| **black surfperch, adult** | 8/21/2003 | **3** | **3** | **9.00** | **1.00** | **2.33** | **0.58** |
| **black surfperch, adult** | 9/24/2003 | **4** | **4** | **9.75** | **0.50** | **2.00** | **0.00** |
| **black surfperch, all** | 8/21/2003 | **3** | **3** | **9.00** | **1.00** | **2.33** | **0.58** |
| **black surfperch, all** | 9/24/2003 | **4** | **4** | **9.75** | **0.50** | **2.00** | **0.00** |
| **black surfperch, juvenile** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 9/24/2003 | **4** | **4** | **2.00** | **4.00** | **0.50** | **1.00** |
| **blackeye goby** | 8/21/2003 | **3** | **3** | **6.00** | **5.20** | **1.33** | **1.15** |
| **blackeye goby** | 9/24/2003 | **4** | **4** | **8.75** | **0.50** | **2.25** | **0.50** |
| **blacksmith, adult** | 8/21/2003 | **3** | **3** | **3.00** | **5.20** | **1.33** | **2.31** |
| **blacksmith, adult** | 9/24/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **blacksmith, all** | 8/21/2003 | **3** | **3** | **3.00** | **5.20** | **1.33** | **2.31** |
| **blacksmith, all** | 9/24/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **blacksmith, juvenile** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/21/2003 | **3** | **3** | **9.67** | **0.58** | **2.67** | **0.58** |
| **blue rockfish, adult** | 9/24/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **blue rockfish, all** | 8/21/2003 | **3** | **3** | **9.67** | **0.58** | **2.67** | **0.58** |
| **blue rockfish, all** | 9/24/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **blue rockfish, juvenile** | 8/21/2003 | **3** | **3** | **6.67** | **5.77** | **2.00** | **1.73** |
| **blue rockfish, juvenile** | 9/24/2003 | **4** | **4** | **10.00** | **0.00** | **2.25** | **0.50** |
| **blue-banded goby** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **bocaccio, juvenile** | 8/21/2003 | **3** | **2** | **6.00** | **0.00** | **3.00** | **0.00** |
| **bocaccio, juvenile** | 9/24/2003 | **4** | **4** | **7.50** | **1.73** | **2.75** | **0.50** |
| **California sheephead,** | 8/21/2003 | **3** | **3** | **10.00** | **0.00** | **2.00** | **0.00** |
| **California sheephead,** | 9/24/2003 | **4** | **4** | **9.75** | **0.50** | **1.75** | **0.50** |
| **California sheephead,** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/21/2003 | **3** | **3** | **10.00** | **0.00** | **2.00** | **0.00** |
| **California sheephead,** | 9/24/2003 | **4** | **4** | **5.25** | **4.11** | **0.75** | **0.50** |
| **copper rockfish** | 8/21/2003 | **3** | **1** | **5.00** | | **1.00** | |
| **copper rockfish** | 9/24/2003 | **4** | **2** | **8.50** | **0.71** | **1.00** | **0.00** |
| **coralline sculpin** | 8/21/2003 | **3** | **1** | **7.00** | | **1.00** | |
| **coralline sculpin** | 9/24/2003 | **4** | **2** | **7.00** | **2.83** | **1.00** | **0.00** |
| **garibaldi, adult** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, adult** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish** | 9/24/2003 | **4** | **2** | **6.50** | **0.71** | **1.00** | **0.00** |
| **gopher/copper rockfish,** | 8/21/2003 | **3** | **3** | **9.67** | **0.58** | **2.67** | **0.58** |
| **gopher/copper rockfish,** | 9/24/2003 | **4** | **4** | **9.25** | **0.96** | **2.00** | **0.00** |
| **halfmoon** | 8/21/2003 | **3** | **1** | **8.00** | | **1.00** | |
| **island kelpfish** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 8/21/2003 | **3** | **3** | **2.67** | **4.62** | **0.67** | **1.15** |
| **kelp bass, adult** | 9/24/2003 | **4** | **4** | **4.50** | **5.26** | **1.00** | **1.15** |
| **kelp bass, calico bass, all** | 8/21/2003 | **3** | **3** | **2.67** | **4.62** | **0.67** | **1.15** |
| **kelp bass, calico bass, all** | 9/24/2003 | **4** | **4** | **4.50** | **5.26** | **1.00** | **1.15** |
| **kelp bass, juvenile** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/21/2003 | **3** | **3** | **9.67** | **0.58** | **1.67** | **0.58** |
| **kelp rockfish, adult** | 9/24/2003 | **4** | **4** | **8.75** | **2.50** | **1.75** | **0.50** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, all** | 8/21/2003 | **3** | **3** | **9.67** | **0.58** | **2.00** | **1.00** |
| **kelp rockfish, all** | 9/24/2003 | **4** | **4** | **9.00** | **2.00** | **2.50** | **0.58** |
| **kelp rockfish, juvenile** | 8/21/2003 | **3** | **3** | **4.00** | **3.46** | **1.00** | **1.00** |
| **kelp rockfish, juvenile** | 9/24/2003 | **4** | **4** | **7.25** | **1.89** | **2.50** | **0.58** |
| **kelp surfperch** | 8/21/2003 | **3** | **3** | **7.33** | **2.31** | **2.33** | **0.58** |
| **kelp surfperch** | 9/24/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **olive rockfish, adult** | 8/21/2003 | **3** | **3** | **6.67** | **5.77** | **1.33** | **1.15** |
| **olive rockfish, adult** | 9/24/2003 | **4** | **4** | **7.25** | **4.86** | **1.25** | **0.96** |
| **olive rockfish, all** | 8/21/2003 | **3** | **3** | **10.00** | **0.00** | **2.67** | **0.58** |
| **olive rockfish, all** | 9/24/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **olive/yellowtail rockfish,** | 8/21/2003 | **3** | **3** | **6.67** | **5.77** | **2.00** | **1.73** |
| **olive/yellowtail rockfish,** | 9/24/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **opaleye, adult** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 8/21/2003 | **3** | **3** | **10.00** | **0.00** | **3.00** | **0.00** |
| **painted greenling** | 9/24/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **pile surfperch, adult** | 8/21/2003 | **3** | **3** | **2.67** | **4.62** | **0.33** | **0.58** |
| **pile surfperch, adult** | 9/24/2003 | **4** | **4** | **9.25** | **0.96** | **2.50** | **0.58** |
| **pile surfperch, all** | 8/21/2003 | **3** | **3** | **5.00** | **4.58** | **1.33** | **1.15** |
| **pile surfperch, all** | 9/24/2003 | **4** | **4** | **9.25** | **0.96** | **2.75** | **0.50** |
| **pile surfperch, juvenile** | 8/21/2003 | **3** | **3** | **5.00** | **4.58** | **1.33** | **1.15** |
| **pile surfperch, juvenile** | 9/24/2003 | **4** | **4** | **6.00** | **4.24** | **1.75** | **1.26** |
| **rainbow surfperch** | 8/21/2003 | **3** | **1** | **10.00** | | **2.00** | |
| **rainbow surfperch** | 9/24/2003 | **4** | **2** | **6.50** | **2.12** | **1.50** | **0.71** |
| **rock wrasse, female** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rubberlip surfperch** | 9/24/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **sculpin spp.** | 8/21/2003 | **3** | **1** | **9.00** | | **1.00** | |
| **sculpin spp.** | 9/24/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **senorita, adult** | 8/21/2003 | **3** | **3** | **8.33** | **1.53** | **3.00** | **0.00** |
| **senorita, adult** | 9/24/2003 | **4** | **4** | **9.25** | **1.50** | **3.00** | **0.00** |
| **senorita, all** | 8/21/2003 | **3** | **3** | **8.33** | **1.53** | **3.00** | **0.00** |
| **senorita, all** | 9/24/2003 | **4** | **4** | **9.25** | **1.50** | **3.00** | **0.00** |
| **senorita, juvenile** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **shiner surfperch** | 9/24/2003 | **4** | **2** | **6.00** | **0.00** | **2.00** | **0.00** |
| **snubnose sculpin** | 9/24/2003 | **4** | **3** | **8.00** | **2.65** | **2.00** | **0.00** |
| **striped surfperch, adult** | 8/21/2003 | **3** | **3** | **6.00** | **5.29** | **1.33** | **1.15** |
| **striped surfperch, adult** | 9/24/2003 | **4** | **4** | **10.00** | **0.00** | **2.25** | **0.50** |
| **striped surfperch, all** | 8/21/2003 | **3** | **3** | **6.00** | **5.29** | **1.33** | **1.15** |
| **striped surfperch, all** | 9/24/2003 | **4** | **4** | **10.00** | **0.00** | **2.25** | **0.50** |
| **striped surfperch, juvenile** | 8/21/2003 | **3** | **3** | **3.33** | **5.77** | **0.33** | **0.58** |
| **striped surfperch, juvenile** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **stripedfin ronquil** | 9/24/2003 | **4** | **2** | **8.50** | **0.71** | **1.50** | **0.71** |
| **surfperch spp.** | 9/24/2003 | **4** | **3** | **6.67** | **1.53** | **2.33** | **0.58** |
| **treefish, adult** | 8/21/2003 | **3** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 9/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 8/21/2003 | **3** | **3** | **5.67** | **4.93** | **1.00** | **1.00** |
| **treefish, juvenile** | 9/24/2003 | **4** | **4** | **6.50** | **4.36** | **1.00** | **0.82** |
| **tubesnout** | 9/24/2003 | **4** | **3** | **7.33** | **2.52** | **2.00** | **1.00** |
| **vermillion rockfish,** | 9/24/2003 | **4** | **3** | **8.33** | **0.58** | **1.00** | **0.00** |
| **white surfperch** | 9/24/2003 | **4** | **1** | **6.00** | | **1.00** | |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 7/24/2003 | **4** | **3** | **8.33** | **2.89** | **1.67** | **0.58** |
| **black and yellow rockfish** | 8/4/2003 | **5** | **1** | **9.00** | | **2.00** | |
| **black surfperch, adult** | 7/24/2003 | **4** | **4** | **9.50** | **1.00** | **2.25** | **0.50** |
| **black surfperch, adult** | 8/4/2003 | **5** | **5** | **7.40** | **4.34** | **1.60** | **0.89** |
| **black surfperch, all** | 7/24/2003 | **4** | **4** | **9.50** | **1.00** | **2.25** | **0.50** |
| **black surfperch, all** | 8/4/2003 | **5** | **5** | **7.40** | **4.34** | **1.60** | **0.89** |
| **black surfperch, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 8/4/2003 | **5** | **5** | **1.40** | **3.13** | **0.20** | **0.45** |
| **blackeye goby** | 7/24/2003 | **4** | **4** | **9.00** | **1.41** | **2.25** | **0.50** |
| **blackeye goby** | 8/4/2003 | **5** | **5** | **9.40** | **0.89** | **3.00** | **0.00** |
| **blacksmith, adult** | 7/24/2003 | **4** | **4** | **8.25** | **0.50** | **3.50** | **0.58** |
| **blacksmith, adult** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, all** | 7/24/2003 | **4** | **4** | **8.25** | **0.50** | **3.50** | **0.58** |
| **blacksmith, all** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/24/2003 | **4** | **4** | **7.25** | **4.86** | **1.25** | **0.96** |
| **blue rockfish, adult** | 8/4/2003 | **5** | **5** | **9.80** | **0.45** | **2.00** | **0.00** |
| **blue rockfish, all** | 7/24/2003 | **4** | **4** | **9.50** | **1.00** | **2.75** | **0.50** |
| **blue rockfish, all** | 8/4/2003 | **5** | **5** | **9.80** | **0.45** | **3.00** | **0.00** |
| **blue rockfish, juvenile** | 7/24/2003 | **4** | **4** | **9.50** | **1.00** | **2.50** | **0.58** |
| **blue rockfish, juvenile** | 8/4/2003 | **5** | **5** | **9.80** | **0.45** | **2.80** | **0.45** |
| **blue-banded goby** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **bocaccio, juvenile** | 7/24/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **cabezon** | 7/24/2003 | **4** | **2** | **9.00** | **0.00** | **1.00** | **0.00** |
| **cabezon** | 8/4/2003 | **5** | **4** | **6.50** | **1.91** | **1.00** | **0.00** |
| **California sheephead,** | 7/24/2003 | **4** | **4** | **10.00** | **0.00** | **2.00** | **0.00** |
| **California sheephead,** | 8/4/2003 | **5** | **5** | **10.00** | **0.00** | **2.20** | **0.45** |
| **California sheephead,** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/4/2003 | **5** | **5** | **2.00** | **4.47** | **0.20** | **0.45** |
| **California sheephead,** | 7/24/2003 | **4** | **4** | **4.25** | **5.06** | **0.75** | **0.96** |
| **California sheephead,** | 8/4/2003 | **5** | **5** | **7.20** | **4.09** | **1.40** | **0.89** |
| **copper rockfish** | 7/24/2003 | **4** | **2** | **8.50** | **2.12** | **2.00** | **0.00** |
| **coralline sculpin** | 7/24/2003 | **4** | **2** | **7.50** | **0.71** | **1.00** | **0.00** |
| **garibaldi, adult** | 7/24/2003 | **4** | **4** | **6.25** | **4.19** | **1.00** | **0.82** |
| **garibaldi, adult** | 8/4/2003 | **5** | **5** | **7.40** | **4.22** | **0.80** | **0.45** |
| **garibaldi, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher rockfish** | 7/24/2003 | **4** | **1** | **8.00** | | **2.00** | |
| **gopher/copper rockfish,** | 7/24/2003 | **4** | **4** | **6.25** | **1.89** | **1.50** | **0.58** |
| **gopher/copper rockfish,** | 8/4/2003 | **5** | **3** | **8.33** | **2.89** | **2.00** | **0.00** |
| **island kelpfish** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **jack mackerel** | 7/24/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **jack mackerel** | 8/4/2003 | **5** | **2** | **6.00** | **1.41** | **3.00** | **0.00** |
| **kelp bass, adult** | 7/24/2003 | **4** | **4** | **1.25** | **2.50** | **0.25** | **0.50** |
| **kelp bass, adult** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, calico bass, all** | 7/24/2003 | **4** | **4** | **1.25** | **2.50** | **0.25** | **0.50** |
| **kelp bass, calico bass, all** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/24/2003 | **4** | **4** | **8.75** | **0.96** | **2.00** | **0.00** |
| **kelp rockfish, adult** | 8/4/2003 | **5** | **5** | **9.40** | **0.89** | **1.60** | **0.55** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, all** | 7/24/2003 | **4** | **4** | **9.00** | **1.15** | **2.25** | **0.50** |
| **kelp rockfish, all** | 8/4/2003 | **5** | **5** | **9.40** | **0.89** | **1.80** | **0.45** |
| **kelp rockfish, juvenile** | 7/24/2003 | **4** | **4** | **4.50** | **5.26** | **1.00** | **1.41** |
| **kelp rockfish, juvenile** | 8/4/2003 | **5** | **5** | **5.20** | **5.02** | **0.80** | **0.84** |
| **kelp surfperch** | 7/24/2003 | **4** | **3** | **7.33** | **2.08** | **2.00** | **1.00** |
| **kelpfish spp.** | 8/4/2003 | **5** | **1** | **8.00** | | **1.00** | |
| **lingcod** | 7/24/2003 | **4** | **2** | **8.00** | **1.41** | **1.00** | **0.00** |
| **lingcod** | 8/4/2003 | **5** | **3** | **8.67** | **2.31** | **1.67** | **0.58** |
| **olive rockfish, adult** | 7/24/2003 | **4** | **4** | **6.50** | **4.36** | **1.50** | **1.00** |
| **olive rockfish, adult** | 8/4/2003 | **5** | **5** | **9.60** | **0.55** | **1.80** | **0.45** |
| **olive rockfish, all** | 7/24/2003 | **4** | **4** | **8.75** | **0.50** | **2.00** | **0.00** |
| **olive rockfish, all** | 8/4/2003 | **5** | **5** | **9.80** | **0.45** | **2.40** | **0.89** |
| **olive/yellowtail rockfish,** | 7/24/2003 | **4** | **4** | **8.00** | **1.41** | **1.75** | **0.50** |
| **olive/yellowtail rockfish,** | 8/4/2003 | **5** | **5** | **8.00** | **4.47** | **1.60** | **1.14** |
| **opaleye, adult** | 7/24/2003 | **4** | **4** | **3.75** | **4.50** | **0.75** | **0.96** |
| **opaleye, adult** | 8/4/2003 | **5** | **5** | **3.20** | **2.95** | **0.60** | **0.55** |
| **opaleye, all** | 7/24/2003 | **4** | **4** | **3.75** | **4.50** | **0.75** | **0.96** |
| **opaleye, all** | 8/4/2003 | **5** | **5** | **3.20** | **2.95** | **0.60** | **0.55** |
| **opaleye, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/24/2003 | **4** | **4** | **10.00** | **0.00** | **3.25** | **0.50** |
| **painted greenling** | 8/4/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **pile surfperch, adult** | 7/24/2003 | **4** | **4** | **7.50** | **1.73** | **2.00** | **0.00** |
| **pile surfperch, adult** | 8/4/2003 | **5** | **5** | **6.40** | **3.78** | **1.60** | **0.89** |
| **pile surfperch, all** | 7/24/2003 | **4** | **4** | **9.25** | **1.50** | **2.25** | **0.50** |
| **pile surfperch, all** | 8/4/2003 | **5** | **5** | **8.00** | **1.22** | **2.00** | **0.00** |
| **pile surfperch, juvenile** | 7/24/2003 | **4** | **4** | **9.00** | **1.41** | **1.50** | **0.58** |
| **pile surfperch, juvenile** | 8/4/2003 | **5** | **5** | **4.60** | **4.22** | **1.20** | **1.10** |
| **rainbow surfperch** | 8/4/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **rock wrasse, female** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rubberlip surfperch** | 8/4/2003 | **5** | **1** | **7.00** | | **2.00** | |
| **senorita, adult** | 7/24/2003 | **4** | **4** | **6.25** | **4.79** | **1.75** | **1.26** |
| **senorita, adult** | 8/4/2003 | **5** | **5** | **4.00** | **3.94** | **0.80** | **0.84** |
| **senorita, all** | 7/24/2003 | **4** | **4** | **6.25** | **4.79** | **1.75** | **1.26** |
| **senorita, all** | 8/4/2003 | **5** | **5** | **4.00** | **3.94** | **0.80** | **0.84** |
| **senorita, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 8/4/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **striped surfperch, adult** | 7/24/2003 | **4** | **4** | **5.75** | **3.86** | **1.25** | **0.96** |
| **striped surfperch, adult** | 8/4/2003 | **5** | **5** | **4.80** | **4.38** | **1.00** | **1.00** |
| **striped surfperch, all** | 7/24/2003 | **4** | **4** | **5.75** | **3.86** | **1.25** | **0.96** |
| **striped surfperch, all** | 8/4/2003 | **5** | **5** | **4.80** | **4.38** | **1.00** | **1.00** |
| **striped surfperch, juvenile** | 7/24/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **swell shark** | 7/24/2003 | **4** | **2** | **8.00** | **1.41** | **2.00** | **0.00** |
| **top smelt** | 8/4/2003 | **5** | **2** | **5.50** | **0.71** | **2.00** | **0.00** |
| **treefish, adult** | 7/24/2003 | **4** | **4** | **7.50** | **1.73** | **1.50** | **0.58** |
| **treefish, adult** | 8/4/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 7/24/2003 | **4** | **4** | **6.75** | **4.57** | **1.00** | **0.82** |
| **treefish, juvenile** | 8/4/2003 | **5** | **5** | **9.00** | **1.00** | **1.20** | **0.45** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 10/8/2003 | **4** | **1** | **5.00** | | **1.00** | |
| **black rockfish** | 7/21/2003 | **5** | **1** | **5.00** | | **1.00** | |
| **black rockfish** | 10/8/2003 | **4** | **3** | **8.67** | **0.58** | **2.00** | **0.00** |
| **black surfperch, adult** | 7/21/2003 | **5** | **4** | **1.50** | **3.00** | **0.50** | **1.00** |
| **black surfperch, adult** | 10/8/2003 | **4** | **4** | **2.75** | **3.20** | **0.50** | **0.58** |
| **black surfperch, all** | 7/21/2003 | **5** | **5** | **2.40** | **3.29** | **0.60** | **0.89** |
| **black surfperch, all** | 10/8/2003 | **4** | **4** | **2.75** | **3.20** | **0.50** | **0.58** |
| **black surfperch, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 7/21/2003 | **5** | **5** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blackeye goby** | 10/8/2003 | **4** | **4** | **10.00** | **0.00** | **3.25** | **0.50** |
| **blacksmith, adult** | 7/21/2003 | **5** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, adult** | 10/8/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 7/21/2003 | **5** | **5** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 10/8/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 10/8/2003 | **4** | **4** | **2.50** | **5.00** | **0.25** | **0.50** |
| **blue rockfish, adult** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 10/8/2003 | **4** | **4** | **9.50** | **0.58** | **1.75** | **0.50** |
| **blue rockfish, all** | 7/21/2003 | **5** | **5** | **6.40** | **4.04** | **2.00** | **1.22** |
| **blue rockfish, all** | 10/8/2003 | **4** | **4** | **9.50** | **0.58** | **1.75** | **0.50** |
| **blue rockfish, juvenile** | 7/21/2003 | **5** | **4** | **8.00** | **2.16** | **2.50** | **0.58** |
| **blue rockfish, juvenile** | 10/8/2003 | **4** | **4** | **4.25** | **4.92** | **0.50** | **0.58** |
| **blue-banded goby** | 7/21/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **cabezon** | 7/21/2003 | **5** | **3** | **8.33** | **1.15** | **1.33** | **0.58** |
| **cabezon** | 10/8/2003 | **4** | **2** | **8.00** | **2.83** | **1.00** | **0.00** |
| **California scorpionfish** | 7/21/2003 | **5** | **1** | **10.00** | | **1.00** | |
| **California scorpionfish** | 10/8/2003 | **4** | **2** | **7.50** | **0.71** | **1.00** | **0.00** |
| **California sheephead,** | 7/21/2003 | **5** | **5** | **6.60** | **3.91** | **1.00** | **0.71** |
| **California sheephead,** | 10/8/2003 | **4** | **4** | **9.00** | **1.41** | **2.00** | **0.00** |
| **California sheephead,** | 7/21/2003 | **5** | **5** | **5.20** | **5.02** | **0.60** | **0.55** |
| **California sheephead,** | 10/8/2003 | **4** | **4** | **5.50** | **4.20** | **0.75** | **0.50** |
| **California sheephead,** | 7/21/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 10/8/2003 | **4** | **4** | **6.00** | **4.24** | **0.75** | **0.50** |
| **copper rockfish** | 7/21/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **copper rockfish** | 10/8/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **coralline sculpin** | 10/8/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **garibaldi, adult** | 7/21/2003 | **5** | **5** | **8.80** | **1.10** | **1.80** | **0.45** |
| **garibaldi, adult** | 10/8/2003 | **4** | **4** | **9.00** | **1.15** | **2.00** | **0.00** |
| **garibaldi, juvenile** | 7/21/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher rockfish** | 7/21/2003 | **5** | **3** | **8.00** | **2.65** | **1.67** | **0.58** |
| **gopher rockfish** | 10/8/2003 | **4** | **2** | **9.00** | **1.41** | **2.00** | **0.00** |
| **gopher/copper rockfish,** | 7/21/2003 | **5** | **2** | **9.50** | **0.71** | **2.00** | **0.00** |
| **gopher/copper rockfish,** | 10/8/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **halfmoon** | 10/8/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **island kelpfish** | 7/21/2003 | **5** | **5** | **5.20** | **4.82** | **1.20** | **1.10** |
| **island kelpfish** | 10/8/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **kelp bass, adult** | 7/21/2003 | **5** | **4** | **9.50** | **1.00** | **2.00** | **0.00** |
| **kelp bass, adult** | 10/8/2003 | **4** | **4** | **9.50** | **1.00** | **2.00** | **0.00** |
| **kelp bass, calico bass, all** | 7/21/2003 | **5** | **5** | **7.60** | **4.34** | **1.60** | **0.89** |
| **kelp bass, calico bass, all** | 10/8/2003 | **4** | **4** | **9.50** | **1.00** | **2.00** | **0.00** |
| **kelp bass, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp bass, juvenile** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/21/2003 | **5** | **4** | **7.00** | **4.69** | **1.25** | **0.96** |
| **kelp rockfish, adult** | 10/8/2003 | **4** | **4** | **6.50** | **4.51** | **1.25** | **0.96** |
| **kelp rockfish, all** | 7/21/2003 | **5** | **5** | **7.60** | **4.28** | **1.60** | **0.89** |
| **kelp rockfish, all** | 10/8/2003 | **4** | **4** | **6.50** | **4.51** | **1.25** | **0.96** |
| **kelp rockfish, juvenile** | 7/21/2003 | **5** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **kelp rockfish, juvenile** | 10/8/2003 | **4** | **4** | **3.50** | **4.36** | **0.50** | **0.58** |
| **kelpfish spp.** | 10/8/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **lingcod** | 10/8/2003 | **4** | **2** | **5.50** | **0.71** | **1.50** | **0.71** |
| **ocean whitefish** | 7/21/2003 | **5** | **3** | **10.00** | **0.00** | **2.00** | **0.00** |
| **ocean whitefish** | 10/8/2003 | **4** | **2** | **6.00** | **1.41** | **1.50** | **0.71** |
| **olive rockfish, adult** | 7/21/2003 | **5** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **olive rockfish, adult** | 10/8/2003 | **4** | **4** | **7.00** | **4.69** | **1.50** | **1.00** |
| **olive rockfish, all** | 7/21/2003 | **5** | **5** | **2.60** | **3.58** | **0.60** | **0.89** |
| **olive rockfish, all** | 10/8/2003 | **4** | **4** | **7.00** | **4.69** | **1.50** | **1.00** |
| **olive/yellowtail rockfish,** | 7/21/2003 | **5** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **olive/yellowtail rockfish,** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 7/21/2003 | **5** | **4** | **3.25** | **3.77** | **0.50** | **0.58** |
| **opaleye, adult** | 10/8/2003 | **4** | **4** | **7.50** | **1.29** | **2.00** | **0.00** |
| **opaleye, all** | 7/21/2003 | **5** | **5** | **2.60** | **3.58** | **0.40** | **0.55** |
| **opaleye, all** | 10/8/2003 | **4** | **4** | **7.50** | **1.29** | **2.00** | **0.00** |
| **opaleye, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pacific angel shark** | 7/21/2003 | **5** | **2** | **8.00** | **0.00** | **1.00** | **0.00** |
| **painted greenling** | 7/21/2003 | **5** | **5** | **10.00** | **0.00** | **3.20** | **0.45** |
| **painted greenling** | 10/8/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **pile surfperch, adult** | 7/21/2003 | **5** | **4** | **8.25** | **1.50** | **2.00** | **0.00** |
| **pile surfperch, adult** | 10/8/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **pile surfperch, all** | 7/21/2003 | **5** | **5** | **8.20** | **1.30** | **1.80** | **0.45** |
| **pile surfperch, all** | 10/8/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **pile surfperch, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/21/2003 | **5** | **5** | **4.80** | **4.55** | **0.80** | **0.84** |
| **rock wrasse, female** | 10/8/2003 | **4** | **4** | **5.50** | **0.58** | **1.75** | **0.50** |
| **rock wrasse, male** | 7/21/2003 | **5** | **5** | **1.60** | **3.58** | **0.40** | **0.89** |
| **rock wrasse, male** | 10/8/2003 | **4** | **4** | **3.75** | **2.50** | **0.75** | **0.50** |
| **rockfish spp., juvenile** | 10/8/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **ronquil spp.** | 10/8/2003 | **4** | **1** | **8.00** | | **2.00** | |
| **rubberlip surfperch** | 7/21/2003 | **5** | **2** | **7.00** | **1.41** | **1.00** | **0.00** |
| **rubberlip surfperch** | 10/8/2003 | **4** | **1** | **10.00** | | **1.00** | |
| **senorita, adult** | 7/21/2003 | **5** | **4** | **8.75** | **1.26** | **2.25** | **0.50** |
| **senorita, adult** | 10/8/2003 | **4** | **4** | **9.50** | **0.58** | **3.00** | **0.00** |
| **senorita, all** | 7/21/2003 | **5** | **5** | **8.80** | **1.10** | **2.20** | **0.45** |
| **senorita, all** | 10/8/2003 | **4** | **4** | **9.50** | **0.58** | **3.00** | **0.00** |
| **senorita, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 7/21/2003 | **5** | **1** | **9.00** | | **1.00** | |
| **striped surfperch, adult** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/21/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 10/8/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/21/2003 | **5** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 10/8/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **stripedfin ronquil** | 7/21/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **swell shark** | 7/21/2003 | **5** | **4** | **8.25** | **1.50** | **1.00** | **0.00** |
| **top smelt** | 7/21/2003 | **5** | **1** | **5.00** | | **2.00** | |
| **treefish, adult** | 7/21/2003 | **5** | **5** | **8.00** | **2.00** | **1.80** | **0.45** |
| **treefish, adult** | 10/8/2003 | **4** | **4** | **7.00** | **4.76** | **1.50** | **1.00** |

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|---|---|---|---|---|---|---|---|
| **treefish, juvenile** | 7/21/2003 | **5** | **5** | **8.40** | **2.07** | **1.80** | **0.45** |
| **treefish, juvenile** | 10/8/2003 | **4** | **3** | **10.00** | **0.00** | **1.67** | **0.58** |
| **white surfperch** | 10/8/2003 | **4** | **2** | **8.00** | **0.00** | **1.00** | **0.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 7/22/2003 | **6** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **black surfperch, adult** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **2.83** | **0.41** |
| **black surfperch, all** | 7/22/2003 | **6** | **6** | **10.00** | **0.00** | **3.00** | **0.00** |
| **black surfperch, all** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **2.83** | **0.41** |
| **black surfperch, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 7/22/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blackeye goby** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, adult** | 7/22/2003 | **6** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blacksmith, adult** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 7/22/2003 | **6** | **6** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blacksmith, all** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 7/22/2003 | **6** | **6** | **1.00** | **2.45** | **0.17** | **0.41** |
| **blue-banded goby** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **cabezon** | 8/20/2003 | **6** | **1** | **7.00** | | **1.00** | |
| **California moray** | 7/22/2003 | **6** | **2** | **8.00** | **0.00** | **1.00** | **0.00** |
| **California scorpionfish** | 8/20/2003 | **6** | **1** | **8.00** | | **1.00** | |
| **California sheephead,** | 7/22/2003 | **6** | **6** | **4.17** | **4.62** | **0.50** | **0.55** |
| **California sheephead,** | 8/20/2003 | **6** | **6** | **4.50** | **4.97** | **0.83** | **0.98** |
| **California sheephead,** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **c-o turbot** | 7/22/2003 | **6** | **1** | **6.00** | | **1.00** | |
| **fringehead spp.** | 7/22/2003 | **6** | **3** | **6.67** | **2.08** | **1.33** | **0.58** |
| **fringehead spp.** | 8/20/2003 | **6** | **1** | **6.00** | | **2.00** | |
| **garibaldi, adult** | 7/22/2003 | **6** | **6** | **10.00** | **0.00** | **2.67** | **0.52** |
| **garibaldi, adult** | 8/20/2003 | **6** | **6** | **9.67** | **0.82** | **2.33** | **0.52** |
| **garibaldi, juvenile** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher/copper rockfish,** | 7/22/2003 | **6** | **5** | **8.00** | **2.00** | **1.20** | **0.45** |
| **gopher/copper rockfish,** | 8/20/2003 | **6** | **3** | **7.67** | **2.52** | **1.67** | **0.58** |
| **halfmoon** | 7/22/2003 | **6** | **1** | **10.00** | | **2.00** | |
| **island kelpfish** | 7/22/2003 | **6** | **6** | **2.67** | **2.94** | **0.50** | **0.55** |
| **island kelpfish** | 8/20/2003 | **6** | **6** | **2.50** | **4.18** | **0.50** | **0.84** |
| **kelp bass, adult** | 7/22/2003 | **6** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **kelp bass, adult** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **2.83** | **0.41** |
| **kelp bass, calico bass, all** | 7/22/2003 | **6** | **6** | **9.67** | **0.82** | **2.83** | **0.41** |
| **kelp bass, calico bass, all** | 8/20/2003 | **6** | **6** | **10.00** | **0.00** | **2.83** | **0.41** |
| **kelp bass, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/22/2003 | **6** | **5** | **8.80** | **1.10** | **1.40** | **0.55** |
| **kelp rockfish, adult** | 8/20/2003 | **6** | **6** | **9.33** | **1.03** | **2.00** | **0.00** |
| **kelp rockfish, all** | 7/22/2003 | **6** | **6** | **7.33** | **3.72** | **1.33** | **0.82** |
| **kelp rockfish, all** | 8/20/2003 | **6** | **6** | **9.33** | **1.03** | **2.00** | **0.00** |
| **kelp rockfish, juvenile** | 7/22/2003 | **6** | **5** | **1.80** | **4.02** | **0.20** | **0.45** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, juvenile** | 8/20/2003 | **6** | **6** | **1.67** | **4.08** | **0.33** | **0.82** |
| **ocean whitefish** | 7/22/2003 | **6** | **5** | **8.40** | **1.34** | **2.00** | **0.00** |
| **ocean whitefish** | 8/20/2003 | **6** | **3** | **8.67** | **1.53** | **1.67** | **0.58** |
| **olive rockfish, adult** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 7/22/2003 | **6** | **5** | **3.00** | **4.47** | **0.80** | **1.10** |
| **opaleye, adult** | 8/20/2003 | **6** | **6** | **2.67** | **4.18** | **0.33** | **0.52** |
| **opaleye, all** | 7/22/2003 | **6** | **6** | **2.50** | **4.18** | **0.67** | **1.03** |
| **opaleye, all** | 8/20/2003 | **6** | **6** | **2.67** | **4.18** | **0.33** | **0.52** |
| **opaleye, juvenile** | 7/22/2003 | **6** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/22/2003 | **6** | **6** | **9.17** | **0.75** | **2.67** | **0.52** |
| **painted greenling** | 8/20/2003 | **6** | **6** | **9.67** | **0.52** | **2.33** | **0.52** |
| **pile surfperch, adult** | 7/22/2003 | **6** | **5** | **7.40** | **4.22** | **1.60** | **0.89** |
| **pile surfperch, adult** | 8/20/2003 | **6** | **6** | **9.83** | **0.41** | **2.00** | **0.00** |
| **pile surfperch, all** | 7/22/2003 | **6** | **6** | **7.00** | **3.90** | **1.50** | **0.84** |
| **pile surfperch, all** | 8/20/2003 | **6** | **6** | **9.83** | **0.41** | **2.00** | **0.00** |
| **pile surfperch, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 8/20/2003 | **6** | **6** | **0.83** | **2.04** | **0.17** | **0.41** |
| **rock wrasse, male** | 7/22/2003 | **6** | **6** | **1.67** | **2.58** | **0.33** | **0.52** |
| **rock wrasse, male** | 8/20/2003 | **6** | **6** | **2.83** | **4.40** | **0.33** | **0.52** |
| **rockfish spp., juvenile** | 7/22/2003 | **6** | **1** | **7.00** | | **1.00** | |
| **rubberlip surfperch** | 7/22/2003 | **6** | **6** | **7.17** | **1.72** | **1.83** | **0.41** |
| **rubberlip surfperch** | 8/20/2003 | **6** | **5** | **9.60** | **0.55** | **2.40** | **0.55** |
| **senorita, adult** | 7/22/2003 | **6** | **5** | **4.00** | **5.48** | **0.40** | **0.55** |
| **senorita, adult** | 8/20/2003 | **6** | **6** | **4.83** | **5.31** | **1.00** | **1.10** |
| **senorita, all** | 7/22/2003 | **6** | **6** | **3.33** | **5.16** | **0.33** | **0.52** |
| **senorita, all** | 8/20/2003 | **6** | **6** | **4.83** | **5.31** | **1.00** | **1.10** |
| **senorita, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/22/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/20/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 7/22/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 8/20/2003 | **6** | **6** | **5.33** | **4.18** | **0.83** | **0.75** |
| **treefish, juvenile** | 7/22/2003 | **6** | **6** | **8.33** | **1.97** | **1.67** | **0.52** |
| **treefish, juvenile** | 8/20/2003 | **6** | **6** | **6.17** | **3.49** | **1.33** | **0.82** |
| **zebra goby** | 8/20/2003 | **6** | **1** | **7.00** | | **1.00** | |

Santa Cruz Island - Scorpion Anchorage

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| black and yellow rockfish | 8/20/2003 | 5 | 1 | 10.00 | | 1.00 | |
| black and yellow rockfish | 9/26/2003 | 5 | 2 | 8.00 | 1.41 | 1.50 | 0.71 |
| black rockfish | 8/20/2003 | 5 | 1 | 8.00 | | 1.00 | |
| black surfperch, adult | 8/20/2003 | 5 | 5 | 10.00 | 0.00 | 2.40 | 0.55 |
| black surfperch, adult | 9/26/2003 | 5 | 5 | 10.00 | 0.00 | 3.00 | 0.00 |
| black surfperch, all | 8/20/2003 | 5 | 5 | 10.00 | 0.00 | 2.40 | 0.55 |
| black surfperch, all | 9/26/2003 | 5 | 5 | 10.00 | 0.00 | 3.00 | 0.00 |
| black surfperch, juvenile | 8/20/2003 | 5 | 5 | 1.00 | 2.24 | 0.20 | 0.45 |
| black surfperch, juvenile | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| blackeye goby | 8/20/2003 | 5 | 5 | 10.00 | 0.00 | 4.00 | 0.00 |
| blackeye goby | 9/26/2003 | 5 | 5 | 10.00 | 0.00 | 3.80 | 0.45 |
| blacksmith, adult | 8/20/2003 | 5 | 5 | 9.80 | 0.45 | 3.80 | 0.45 |
| blacksmith, adult | 9/26/2003 | 5 | 5 | 10.00 | 0.00 | 3.80 | 0.45 |
| blacksmith, all | 8/20/2003 | 5 | 5 | 9.80 | 0.45 | 3.80 | 0.45 |
| blacksmith, all | 9/26/2003 | 5 | 5 | 10.00 | 0.00 | 3.80 | 0.45 |
| blacksmith, juvenile | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| blacksmith, juvenile | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| blue rockfish, adult | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| blue rockfish, adult | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| blue rockfish, all | 8/20/2003 | 5 | 5 | 4.00 | 5.48 | 0.40 | 0.55 |
| blue rockfish, all | 9/26/2003 | 5 | 5 | 3.60 | 4.93 | 0.60 | 0.89 |
| blue rockfish, juvenile | 8/20/2003 | 5 | 5 | 4.00 | 5.48 | 0.40 | 0.55 |
| blue rockfish, juvenile | 9/26/2003 | 5 | 5 | 3.60 | 4.93 | 0.60 | 0.89 |
| blue-banded goby | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| blue-banded goby | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| brown rockfish, juvenile | 9/26/2003 | 5 | 2 | 7.50 | 0.71 | 1.00 | 0.00 |
| California scorpionfish | 8/20/2003 | 5 | 1 | 10.00 | | 1.00 | |
| California scorpionfish | 9/26/2003 | 5 | 2 | 8.00 | 0.00 | 1.00 | 0.00 |
| California sheephead, | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| California sheephead, | 9/26/2003 | 5 | 5 | 6.60 | 4.22 | 1.20 | 0.84 |
| California sheephead, | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| California sheephead, | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| California sheephead, | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| California sheephead, | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| c-o turbot | 9/26/2003 | 5 | 1 | 6.00 | | 1.00 | |
| coralline sculpin | 8/20/2003 | 5 | 1 | 6.00 | | 1.00 | |
| fringehead spp. | 9/26/2003 | 5 | 1 | 9.00 | | 1.00 | |
| garibaldi, adult | 8/20/2003 | 5 | 5 | 9.80 | 0.45 | 2.20 | 0.45 |
| garibaldi, adult | 9/26/2003 | 5 | 5 | 9.60 | 0.89 | 2.00 | 0.00 |
| garibaldi, juvenile | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| garibaldi, juvenile | 9/26/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |
| gopher rockfish | 8/20/2003 | 5 | 1 | 7.00 | | 1.00 | |
| gopher/copper rockfish, | 8/20/2003 | 5 | 3 | 10.00 | 0.00 | 1.67 | 0.58 |
| gopher/copper rockfish, | 9/26/2003 | 5 | 3 | 8.33 | 2.08 | 2.00 | 0.00 |
| halfmoon | 8/20/2003 | 5 | 2 | 9.00 | 0.00 | 1.50 | 0.71 |
| halfmoon | 9/26/2003 | 5 | 2 | 10.00 | 0.00 | 1.50 | 0.71 |
| horn shark | 8/20/2003 | 5 | 2 | 9.50 | 0.71 | 1.50 | 0.71 |
| island kelpfish | 8/20/2003 | 5 | 5 | 7.00 | 4.24 | 1.40 | 0.89 |
| island kelpfish | 9/26/2003 | 5 | 5 | 2.60 | 3.71 | 0.40 | 0.55 |
| kelp bass, adult | 8/20/2003 | 5 | 5 | 3.40 | 4.77 | 0.60 | 0.89 |
| kelp bass, adult | 9/26/2003 | 5 | 5 | 9.00 | 1.73 | 1.80 | 0.45 |
| kelp bass, calico bass, all | 8/20/2003 | 5 | 5 | 3.40 | 4.77 | 0.60 | 0.89 |
| kelp bass, calico bass, all | 9/26/2003 | 5 | 5 | 9.00 | 1.73 | 1.80 | 0.45 |
| kelp bass, juvenile | 8/20/2003 | 5 | 5 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp bass, juvenile** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/20/2003 | **5** | **5** | **3.00** | **4.47** | **0.60** | **0.89** |
| **kelp rockfish, adult** | 9/26/2003 | **5** | **5** | **7.40** | **1.52** | **1.20** | **0.45** |
| **kelp rockfish, all** | 8/20/2003 | **5** | **5** | **3.00** | **4.47** | **0.60** | **0.89** |
| **kelp rockfish, all** | 9/26/2003 | **5** | **5** | **7.40** | **1.52** | **1.20** | **0.45** |
| **kelp rockfish, juvenile** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 8/20/2003 | **5** | **5** | **4.00** | **5.48** | **0.40** | **0.55** |
| **olive rockfish, adult** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 8/20/2003 | **5** | **5** | **4.00** | **5.48** | **0.40** | **0.55** |
| **olive rockfish, all** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/26/2003 | **5** | **5** | **9.00** | **1.00** | **2.00** | **0.00** |
| **opaleye, all** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/26/2003 | **5** | **5** | **9.00** | **1.00** | **2.00** | **0.00** |
| **opaleye, juvenile** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 8/20/2003 | **5** | **5** | **9.80** | **0.45** | **2.60** | **0.55** |
| **painted greenling** | 9/26/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **pile surfperch, adult** | 8/20/2003 | **5** | **5** | **4.20** | **4.02** | **0.80** | **0.84** |
| **pile surfperch, adult** | 9/26/2003 | **5** | **5** | **6.80** | **3.83** | **1.00** | **0.71** |
| **pile surfperch, all** | 8/20/2003 | **5** | **5** | **4.20** | **4.02** | **0.80** | **0.84** |
| **pile surfperch, all** | 9/26/2003 | **5** | **5** | **6.80** | **3.83** | **1.00** | **0.71** |
| **pile surfperch, juvenile** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 8/20/2003 | **5** | **5** | **8.40** | **2.19** | **1.60** | **0.55** |
| **rock wrasse, female** | 9/26/2003 | **5** | **5** | **7.20** | **4.21** | **1.40** | **0.89** |
| **rock wrasse, male** | 8/20/2003 | **5** | **5** | **2.40** | **3.29** | **0.40** | **0.55** |
| **rock wrasse, male** | 9/26/2003 | **5** | **5** | **8.40** | **1.52** | **1.40** | **0.55** |
| **rockfish spp., juvenile** | 8/20/2003 | **5** | **2** | **7.50** | **3.54** | **1.00** | **0.00** |
| **senorita, adult** | 8/20/2003 | **5** | **5** | **9.80** | **0.45** | **3.00** | **0.00** |
| **senorita, adult** | 9/26/2003 | **5** | **5** | **9.80** | **0.45** | **2.80** | **0.45** |
| **senorita, all** | 8/20/2003 | **5** | **5** | **9.80** | **0.45** | **3.00** | **0.00** |
| **senorita, all** | 9/26/2003 | **5** | **5** | **9.80** | **0.45** | **2.80** | **0.45** |
| **senorita, juvenile** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/26/2003 | **5** | **5** | **1.20** | **2.68** | **0.20** | **0.45** |
| **snubnose sculpin** | 8/20/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **striped surfperch, adult** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 9/26/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **top smelt** | 9/26/2003 | **5** | **2** | **7.50** | **3.54** | **2.50** | **0.71** |
| **treefish, adult** | 8/20/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 9/26/2003 | **5** | **5** | **2.40** | **3.36** | **0.40** | **0.55** |
| **treefish, juvenile** | 8/20/2003 | **5** | **5** | **2.60** | **3.58** | **0.60** | **0.89** |
| **treefish, juvenile** | 9/26/2003 | **5** | **5** | **3.20** | **2.95** | **0.80** | **0.84** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 8/7/2003 | **4** | **2** | **9.00** | **0.00** | **1.50** | **0.71** |
| **black and yellow rockfish** | 9/22/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **black surfperch, adult** | 8/7/2003 | **4** | **4** | **9.25** | **0.50** | **1.75** | **0.50** |
| **black surfperch, adult** | 9/22/2003 | **4** | **3** | **9.00** | **1.00** | **1.67** | **0.58** |
| **black surfperch, all** | 8/7/2003 | **4** | **4** | **9.25** | **0.50** | **1.75** | **0.50** |
| **black surfperch, all** | 9/22/2003 | **4** | **4** | **9.00** | **0.82** | **1.75** | **0.50** |
| **black surfperch, juvenile** | 8/7/2003 | **4** | **4** | **1.75** | **3.50** | **0.50** | **1.00** |
| **black surfperch, juvenile** | 9/22/2003 | **4** | **3** | **3.00** | **5.20** | **0.67** | **1.15** |
| **blackeye goby** | 8/7/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blackeye goby** | 9/22/2003 | **4** | **4** | **8.50** | **1.91** | **2.75** | **0.50** |
| **blacksmith, adult** | 8/7/2003 | **4** | **4** | **6.25** | **4.35** | **1.50** | **1.29** |
| **blacksmith, adult** | 9/22/2003 | **4** | **3** | **2.33** | **4.04** | **0.33** | **0.58** |
| **blacksmith, all** | 8/7/2003 | **4** | **4** | **6.25** | **4.35** | **1.50** | **1.29** |
| **blacksmith, all** | 9/22/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **blacksmith, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 9/22/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **blue rockfish, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 9/22/2003 | **4** | **3** | **2.67** | **4.62** | **0.33** | **0.58** |
| **blue-banded goby** | 8/7/2003 | **4** | **4** | **1.50** | **3.00** | **0.25** | **0.50** |
| **blue-banded goby** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **cabezon** | 8/7/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **cabezon, juvenile** | 9/22/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **California scorpionfish** | 8/7/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **California scorpionfish** | 9/22/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **California sheephead,** | 8/7/2003 | **4** | **4** | **7.25** | **4.86** | **1.50** | **1.00** |
| **California sheephead,** | 9/22/2003 | **4** | **4** | **6.50** | **4.51** | **0.75** | **0.50** |
| **California sheephead,** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **copper rockfish** | 8/7/2003 | **4** | **2** | **8.00** | **0.00** | **2.00** | **0.00** |
| **fringehead spp.** | 8/7/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **garibaldi, adult** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, adult** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher rockfish** | 8/7/2003 | **4** | **2** | **7.50** | **3.54** | **1.50** | **0.71** |
| **gopher rockfish** | 9/22/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **gopher/copper rockfish,** | 8/7/2003 | **4** | **4** | **9.25** | **0.50** | **2.75** | **0.50** |
| **gopher/copper rockfish,** | 9/22/2003 | **4** | **2** | **9.00** | **1.41** | **1.50** | **0.71** |
| **island kelpfish** | 8/7/2003 | **4** | **4** | **2.50** | **5.00** | **0.25** | **0.50** |
| **island kelpfish** | 9/22/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **kelp bass, adult** | 8/7/2003 | **4** | **4** | **3.75** | **4.50** | **0.75** | **0.96** |
| **kelp bass, adult** | 9/22/2003 | **4** | **3** | **3.67** | **3.21** | **0.67** | **0.58** |
| **kelp bass, calico bass, all** | 8/7/2003 | **4** | **4** | **3.75** | **4.50** | **0.75** | **0.96** |
| **kelp bass, calico bass, all** | 9/22/2003 | **4** | **4** | **4.00** | **2.71** | **0.75** | **0.50** |
| **kelp bass, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/7/2003 | **4** | **4** | **6.00** | **4.32** | **1.25** | **0.96** |
| **kelp rockfish, adult** | 9/22/2003 | **4** | **3** | **2.67** | **4.62** | **0.33** | **0.58** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, all** | 8/7/2003 | **4** | **4** | **8.75** | **0.96** | **2.50** | **1.00** |
| **kelp rockfish, all** | 9/22/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **kelp rockfish, juvenile** | 8/7/2003 | **4** | **4** | **6.75** | **4.57** | **2.25** | **1.50** |
| **kelp rockfish, juvenile** | 9/22/2003 | **4** | **3** | **3.33** | **5.77** | **0.67** | **1.15** |
| **kelp surfperch** | 8/7/2003 | **4** | **2** | **6.00** | **1.41** | **2.00** | **0.00** |
| **kelp surfperch** | 9/22/2003 | **4** | **3** | **8.67** | **2.31** | **2.67** | **0.58** |
| **ocean whitefish** | 8/7/2003 | **4** | **1** | **6.00** | | **2.00** | |
| **ocean whitefish** | 9/22/2003 | **4** | **1** | **5.00** | | **1.00** | |
| **olive rockfish, adult** | 8/7/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **olive rockfish, adult** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 8/7/2003 | **4** | **4** | **7.00** | **4.69** | **1.50** | **1.00** |
| **olive rockfish, all** | 9/22/2003 | **4** | **4** | **4.50** | **5.26** | **0.75** | **0.96** |
| **olive/yellowtail rockfish,** | 8/7/2003 | **4** | **4** | **6.75** | **4.50** | **1.50** | **1.00** |
| **olive/yellowtail rockfish,** | 9/22/2003 | **4** | **3** | **2.67** | **4.62** | **0.33** | **0.58** |
| **opaleye, adult** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 8/7/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **painted greenling** | 9/22/2003 | **4** | **4** | **9.50** | **0.58** | **2.25** | **0.50** |
| **pile surfperch, adult** | 8/7/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **pile surfperch, adult** | 9/22/2003 | **4** | **3** | **4.33** | **3.79** | **1.00** | **1.00** |
| **pile surfperch, all** | 8/7/2003 | **4** | **4** | **4.00** | **4.69** | **1.00** | **1.41** |
| **pile surfperch, all** | 9/22/2003 | **4** | **4** | **6.75** | **4.57** | **1.50** | **1.00** |
| **pile surfperch, juvenile** | 8/7/2003 | **4** | **4** | **2.25** | **4.50** | **0.75** | **1.50** |
| **pile surfperch, juvenile** | 9/22/2003 | **4** | **3** | **5.67** | **4.93** | **1.33** | **1.15** |
| **rainbow surfperch** | 8/7/2003 | **4** | **2** | **9.50** | **0.71** | **1.00** | **0.00** |
| **rainbow surfperch** | 9/22/2003 | **4** | **2** | **9.50** | **0.71** | **1.50** | **0.71** |
| **rainbow surfperch,** | 8/7/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **rock wrasse, female** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 9/22/2003 | **4** | **4** | **4.00** | **4.69** | **0.75** | **0.96** |
| **rock wrasse, male** | 8/7/2003 | **4** | **4** | **2.25** | **4.50** | **0.25** | **0.50** |
| **rock wrasse, male** | 9/22/2003 | **4** | **4** | **4.25** | **5.06** | **0.50** | **0.58** |
| **sculpin spp.** | 9/22/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **senorita, adult** | 8/7/2003 | **4** | **4** | **9.25** | **0.96** | **2.50** | **0.58** |
| **senorita, adult** | 9/22/2003 | **4** | **3** | **9.33** | **1.15** | **1.67** | **0.58** |
| **senorita, all** | 8/7/2003 | **4** | **4** | **9.25** | **0.96** | **2.50** | **0.58** |
| **senorita, all** | 9/22/2003 | **4** | **4** | **9.50** | **1.00** | **2.00** | **0.82** |
| **senorita, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 9/22/2003 | **4** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **top smelt** | 9/22/2003 | **4** | **3** | **10.00** | **0.00** | **3.33** | **0.58** |
| **treefish, adult** | 8/7/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 9/22/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 8/7/2003 | **4** | **4** | **8.50** | **1.29** | **1.50** | **0.58** |
| **treefish, juvenile** | 9/22/2003 | **4** | **4** | **2.25** | **4.50** | **0.25** | **0.50** |
| **vermillion rockfish** | 9/22/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **white surfperch** | 9/22/2003 | **4** | **1** | **8.00** | | **1.00** | |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 7/10/2003 | **6** | **5** | **9.80** | **0.45** | **2.00** | **0.00** |
| **black surfperch, adult** | 8/18/2003 | **6** | **6** | **6.50** | **3.51** | **1.33** | **0.82** |
| **black surfperch, all** | 7/10/2003 | **6** | **6** | **9.83** | **0.41** | **2.00** | **0.00** |
| **black surfperch, all** | 8/18/2003 | **6** | **6** | **6.50** | **3.51** | **1.33** | **0.82** |
| **black surfperch, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 7/10/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blackeye goby** | 8/18/2003 | **6** | **6** | **10.00** | **0.00** | **3.67** | **0.52** |
| **blacksmith, adult** | 7/10/2003 | **6** | **5** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, adult** | 8/18/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 7/10/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 8/18/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/18/2003 | **6** | **6** | **2.33** | **3.61** | **0.50** | **0.84** |
| **blue rockfish, all** | 7/10/2003 | **6** | **6** | **5.00** | **5.48** | **0.83** | **0.98** |
| **blue rockfish, all** | 8/18/2003 | **6** | **6** | **4.00** | **4.52** | **0.83** | **0.98** |
| **blue rockfish, juvenile** | 7/10/2003 | **6** | **5** | **6.00** | **5.48** | **1.00** | **1.00** |
| **blue rockfish, juvenile** | 8/18/2003 | **6** | **6** | **2.83** | **4.49** | **0.50** | **0.84** |
| **blue-banded goby** | 7/10/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **cabezon** | 8/18/2003 | **6** | **3** | **7.33** | **1.15** | **1.67** | **0.58** |
| **California scorpionfish** | 7/10/2003 | **6** | **1** | **7.00** | | **1.00** | |
| **California sheephead,** | 7/10/2003 | **6** | **6** | **9.50** | **0.84** | **2.00** | **0.00** |
| **California sheephead,** | 8/18/2003 | **6** | **6** | **10.00** | **0.00** | **2.17** | **0.41** |
| **California sheephead,** | 7/10/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/10/2003 | **6** | **6** | **7.17** | **3.97** | **0.83** | **0.41** |
| **California sheephead,** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **coralline sculpin** | 7/10/2003 | **6** | **1** | **5.00** | | **1.00** | |
| **garibaldi, adult** | 7/10/2003 | **6** | **6** | **9.83** | **0.41** | **2.00** | **0.00** |
| **garibaldi, adult** | 8/18/2003 | **6** | **6** | **9.00** | **0.89** | **2.00** | **0.00** |
| **garibaldi, juvenile** | 7/10/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **gopher/copper rockfish,** | 7/10/2003 | **6** | **3** | **8.00** | **1.73** | **1.33** | **0.58** |
| **gopher/copper rockfish,** | 8/18/2003 | **6** | **2** | **6.00** | **1.41** | **1.50** | **0.71** |
| **halfmoon** | 7/10/2003 | **6** | **1** | **7.00** | | **2.00** | |
| **halfmoon** | 8/18/2003 | **6** | **2** | **9.00** | **0.00** | **1.50** | **0.71** |
| **island kelpfish** | 7/10/2003 | **6** | **6** | **7.00** | **3.69** | **1.67** | **0.82** |
| **island kelpfish** | 8/18/2003 | **6** | **6** | **5.33** | **4.46** | **1.00** | **0.89** |
| **kelp bass, adult** | 7/10/2003 | **6** | **5** | **5.80** | **5.31** | **1.00** | **1.00** |
| **kelp bass, adult** | 8/18/2003 | **6** | **6** | **3.83** | **4.22** | **1.00** | **1.10** |
| **kelp bass, calico bass, all** | 7/10/2003 | **6** | **6** | **6.33** | **4.93** | **1.17** | **0.98** |
| **kelp bass, calico bass, all** | 8/18/2003 | **6** | **6** | **3.83** | **4.22** | **1.00** | **1.10** |
| **kelp bass, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, all** | 7/10/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, all** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelpfish spp.** | 7/10/2003 | **6** | **1** | **8.00** | | **1.00** | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **ocean whitefish** | 7/10/2003 | **6** | **4** | **8.50** | **1.73** | **1.25** | **0.50** |
| **ocean whitefish** | 8/18/2003 | **6** | **1** | **9.00** | | **2.00** | |
| **olive rockfish, adult** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 8/18/2003 | **6** | **6** | **1.17** | **2.86** | **0.17** | **0.41** |
| **olive rockfish, all** | 7/10/2003 | **6** | **6** | **2.33** | **3.61** | **0.33** | **0.52** |
| **olive rockfish, all** | 8/18/2003 | **6** | **6** | **1.17** | **2.86** | **0.17** | **0.41** |
| **olive/yellowtail rockfish,** | 7/10/2003 | **6** | **5** | **1.40** | **3.13** | **0.20** | **0.45** |
| **olive/yellowtail rockfish,** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 7/10/2003 | **6** | **5** | **10.00** | **0.00** | **2.60** | **0.55** |
| **opaleye, adult** | 8/18/2003 | **6** | **6** | **8.00** | **3.95** | **1.83** | **0.98** |
| **opaleye, all** | 7/10/2003 | **6** | **6** | **9.83** | **0.41** | **2.50** | **0.55** |
| **opaleye, all** | 8/18/2003 | **6** | **6** | **8.00** | **3.95** | **1.83** | **0.98** |
| **opaleye, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/10/2003 | **6** | **6** | **10.00** | **0.00** | **3.00** | **0.00** |
| **painted greenling** | 8/18/2003 | **6** | **6** | **10.00** | **0.00** | **3.17** | **0.41** |
| **pile surfperch, adult** | 7/10/2003 | **6** | **5** | **6.60** | **3.78** | **1.40** | **0.89** |
| **pile surfperch, adult** | 8/18/2003 | **6** | **6** | **4.50** | **5.05** | **0.50** | **0.55** |
| **pile surfperch, all** | 7/10/2003 | **6** | **6** | **7.17** | **3.66** | **1.50** | **0.84** |
| **pile surfperch, all** | 8/18/2003 | **6** | **6** | **4.50** | **5.05** | **0.50** | **0.55** |
| **pile surfperch, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/10/2003 | **6** | **6** | **4.83** | **5.31** | **1.00** | **1.10** |
| **rock wrasse, female** | 8/18/2003 | **6** | **6** | **9.67** | **0.52** | **2.00** | **0.00** |
| **rock wrasse, male** | 7/10/2003 | **6** | **6** | **2.33** | **3.83** | **0.33** | **0.52** |
| **rock wrasse, male** | 8/18/2003 | **6** | **6** | **5.50** | **4.59** | **1.33** | **1.03** |
| **rubberlip surfperch** | 7/10/2003 | **6** | **1** | **10.00** | | **1.00** | |
| **senorita, adult** | 7/10/2003 | **6** | **5** | **5.40** | **5.08** | **1.40** | **1.34** |
| **senorita, adult** | 8/18/2003 | **6** | **6** | **9.67** | **0.52** | **3.00** | **0.00** |
| **senorita, all** | 7/10/2003 | **6** | **6** | **6.17** | **4.92** | **1.50** | **1.22** |
| **senorita, all** | 8/18/2003 | **6** | **6** | **9.67** | **0.52** | **3.00** | **0.00** |
| **senorita, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/10/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/10/2003 | **6** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/18/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 7/10/2003 | **6** | **6** | **3.67** | **4.03** | **0.50** | **0.55** |
| **treefish, adult** | 8/18/2003 | **6** | **6** | **5.17** | **4.22** | **0.67** | **0.52** |
| **treefish, juvenile** | 7/10/2003 | **6** | **6** | **7.50** | **1.87** | **1.50** | **0.55** |
| **treefish, juvenile** | 8/18/2003 | **6** | **6** | **5.33** | **4.46** | **1.17** | **0.98** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 7/11/2003 | **7** | **6** | **9.33** | **0.82** | **1.83** | **0.41** |
| **black surfperch, adult** | 7/25/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **black surfperch, all** | 7/11/2003 | **7** | **7** | **9.29** | **0.76** | **2.29** | **0.49** |
| **black surfperch, all** | 7/25/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **black surfperch, juvenile** | 7/11/2003 | **7** | **6** | **5.17** | **4.22** | **1.17** | **0.98** |
| **black surfperch, juvenile** | 7/25/2003 | **4** | **4** | **3.75** | **2.50** | **1.50** | **1.00** |
| **blackeye goby** | 7/11/2003 | **7** | **7** | **10.00** | **0.00** | **3.29** | **0.49** |
| **blackeye goby** | 7/25/2003 | **4** | **4** | **9.75** | **0.50** | **3.75** | **0.50** |
| **blacksmith, adult** | 7/11/2003 | **7** | **6** | **10.00** | **0.00** | **3.83** | **0.41** |
| **blacksmith, adult** | 7/25/2003 | **4** | **4** | **9.75** | **0.50** | **3.75** | **0.50** |
| **blacksmith, all** | 7/11/2003 | **7** | **7** | **10.00** | **0.00** | **3.86** | **0.38** |
| **blacksmith, all** | 7/25/2003 | **4** | **4** | **9.75** | **0.50** | **3.75** | **0.50** |
| **blacksmith, juvenile** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 7/11/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 7/25/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **blue rockfish, juvenile** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 7/25/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **blue-banded goby** | 7/11/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **brown rockfish** | 7/11/2003 | **7** | **1** | **6.00** | | **1.00** | |
| **cabezon** | 7/11/2003 | **7** | **2** | **6.50** | **2.12** | **1.00** | **0.00** |
| **California scorpionfish** | 7/11/2003 | **7** | **1** | **8.00** | | **1.00** | |
| **California scorpionfish** | 7/25/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **California sheephead,** | 7/11/2003 | **7** | **7** | **9.86** | **0.38** | **2.00** | **0.00** |
| **California sheephead,** | 7/25/2003 | **4** | **4** | **8.75** | **0.96** | **2.00** | **0.00** |
| **California sheephead,** | 7/11/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/11/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, adult** | 7/11/2003 | **7** | **7** | **10.00** | **0.00** | **2.86** | **0.38** |
| **garibaldi, adult** | 7/25/2003 | **4** | **4** | **9.50** | **0.58** | **2.75** | **0.50** |
| **garibaldi, juvenile** | 7/11/2003 | **7** | **7** | **1.14** | **3.02** | **0.14** | **0.38** |
| **garibaldi, juvenile** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish, juvenile** | 7/11/2003 | **7** | **4** | **7.50** | **2.89** | **2.00** | **0.82** |
| **giant kelpfish, juvenile** | 7/25/2003 | **4** | **2** | **9.50** | **0.71** | **2.50** | **0.71** |
| **gopher/copper rockfish,** | 7/11/2003 | **7** | **5** | **8.40** | **1.14** | **1.80** | **0.84** |
| **gopher/copper rockfish,** | 7/25/2003 | **4** | **3** | **9.33** | **1.15** | **1.67** | **0.58** |
| **halfmoon** | 7/11/2003 | **7** | **1** | **8.00** | | **2.00** | |
| **halfmoon** | 7/25/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **island kelpfish** | 7/11/2003 | **7** | **7** | **9.71** | **0.76** | **2.71** | **0.49** |
| **island kelpfish** | 7/25/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **kelp bass, adult** | 7/11/2003 | **7** | **6** | **10.00** | **0.00** | **2.50** | **0.55** |
| **kelp bass, adult** | 7/25/2003 | **4** | **4** | **9.00** | **0.82** | **2.00** | **0.00** |
| **kelp bass, calico bass, all** | 7/11/2003 | **7** | **7** | **10.00** | **0.00** | **2.43** | **0.53** |
| **kelp bass, calico bass, all** | 7/25/2003 | **4** | **4** | **9.00** | **0.82** | **2.00** | **0.00** |
| **kelp bass, juvenile** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/11/2003 | **7** | **6** | **4.17** | **4.75** | **0.67** | **0.82** |
| **kelp rockfish, adult** | 7/25/2003 | **4** | **4** | **9.00** | **0.82** | **1.75** | **0.50** |
| **kelp rockfish, all** | 7/11/2003 | **7** | **7** | **4.43** | **4.39** | **0.86** | **0.90** |
| **kelp rockfish, all** | 7/25/2003 | **4** | **4** | **9.00** | **0.82** | **1.75** | **0.50** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, juvenile** | 7/11/2003 | **7** | **6** | **1.67** | **4.08** | **0.33** | **0.82** |
| **kelp rockfish, juvenile** | 7/25/2003 | **4** | **4** | **2.25** | **4.50** | **0.50** | **1.00** |
| **kelp surfperch** | 7/11/2003 | **7** | **7** | **9.00** | **1.53** | **2.57** | **0.53** |
| **kelp surfperch** | 7/25/2003 | **4** | **3** | **9.67** | **0.58** | **2.67** | **0.58** |
| **kelpfish spp.** | 7/25/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **ocean whitefish** | 7/25/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **olive rockfish, adult** | 7/11/2003 | **7** | **6** | **2.67** | **4.32** | **0.50** | **0.84** |
| **olive rockfish, adult** | 7/25/2003 | **4** | **4** | **3.75** | **4.79** | **1.00** | **1.15** |
| **olive rockfish, all** | 7/11/2003 | **7** | **7** | **6.29** | **4.54** | **1.00** | **0.82** |
| **olive rockfish, all** | 7/25/2003 | **4** | **4** | **9.00** | **0.82** | **2.50** | **0.58** |
| **olive/yellowtail rockfish,** | 7/11/2003 | **7** | **6** | **4.67** | **5.16** | **0.67** | **0.82** |
| **olive/yellowtail rockfish,** | 7/25/2003 | **4** | **4** | **8.25** | **0.96** | **2.50** | **0.58** |
| **opaleye, adult** | 7/11/2003 | **7** | **6** | **10.00** | **0.00** | **2.83** | **0.41** |
| **opaleye, adult** | 7/25/2003 | **4** | **4** | **6.75** | **2.22** | **1.75** | **0.50** |
| **opaleye, all** | 7/11/2003 | **7** | **7** | **10.00** | **0.00** | **2.86** | **0.38** |
| **opaleye, all** | 7/25/2003 | **4** | **4** | **6.75** | **2.22** | **1.75** | **0.50** |
| **opaleye, juvenile** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/11/2003 | **7** | **7** | **9.43** | **0.79** | **2.43** | **0.53** |
| **painted greenling** | 7/25/2003 | **4** | **4** | **9.50** | **0.58** | **2.75** | **0.50** |
| **pile surfperch, adult** | 7/11/2003 | **7** | **6** | **2.50** | **4.18** | **0.50** | **0.84** |
| **pile surfperch, adult** | 7/25/2003 | **4** | **4** | **6.25** | **4.19** | **1.25** | **0.96** |
| **pile surfperch, all** | 7/11/2003 | **7** | **7** | **4.86** | **3.72** | **1.14** | **0.90** |
| **pile surfperch, all** | 7/25/2003 | **4** | **4** | **6.25** | **4.19** | **1.25** | **0.96** |
| **pile surfperch, juvenile** | 7/11/2003 | **7** | **6** | **2.00** | **3.16** | **0.50** | **0.84** |
| **pile surfperch, juvenile** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/11/2003 | **7** | **7** | **8.14** | **1.35** | **1.57** | **0.53** |
| **rock wrasse, female** | 7/25/2003 | **4** | **4** | **9.00** | **2.00** | **1.50** | **0.58** |
| **rock wrasse, male** | 7/11/2003 | **7** | **7** | **1.57** | **2.70** | **0.29** | **0.49** |
| **rock wrasse, male** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, adult** | 7/11/2003 | **7** | **6** | **9.83** | **0.41** | **2.83** | **0.41** |
| **senorita, adult** | 7/25/2003 | **4** | **4** | **9.00** | **1.15** | **2.25** | **0.50** |
| **senorita, all** | 7/11/2003 | **7** | **7** | **9.86** | **0.38** | **2.86** | **0.38** |
| **senorita, all** | 7/25/2003 | **4** | **4** | **9.50** | **1.00** | **2.75** | **0.50** |
| **senorita, juvenile** | 7/11/2003 | **7** | **6** | **1.17** | **2.86** | **0.33** | **0.82** |
| **senorita, juvenile** | 7/25/2003 | **4** | **4** | **5.00** | **5.77** | **1.50** | **1.73** |
| **shiner surfperch** | 7/25/2003 | **4** | **3** | **8.67** | **2.31** | **3.33** | **0.58** |
| **snubnose sculpin** | 7/25/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **striped surfperch, adult** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/11/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/11/2003 | **7** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/25/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **top smelt** | 7/11/2003 | **7** | **5** | **8.20** | **2.05** | **3.80** | **0.45** |
| **treefish, adult** | 7/11/2003 | **7** | **7** | **4.43** | **4.28** | **0.71** | **0.76** |
| **treefish, adult** | 7/25/2003 | **4** | **4** | **1.25** | **2.50** | **0.50** | **1.00** |
| **treefish, juvenile** | 7/11/2003 | **7** | **7** | **8.71** | **1.11** | **1.86** | **0.38** |
| **treefish, juvenile** | 7/25/2003 | **4** | **4** | **9.50** | **0.58** | **2.00** | **0.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black and yellow rockfish** | 9/12/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **black surfperch, adult** | 8/8/2003 | **5** | **5** | **9.80** | **0.45** | **2.20** | **0.45** |
| **black surfperch, adult** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **black surfperch, all** | 8/8/2003 | **5** | **5** | **9.80** | **0.45** | **2.20** | **0.45** |
| **black surfperch, all** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **black surfperch, juvenile** | 8/8/2003 | **5** | **5** | **2.80** | **3.90** | **0.60** | **0.89** |
| **black surfperch, juvenile** | 9/12/2003 | **4** | **4** | **4.25** | **5.06** | **0.75** | **0.96** |
| **blackeye goby** | 8/8/2003 | **5** | **5** | **9.60** | **0.55** | **2.80** | **0.45** |
| **blackeye goby** | 9/12/2003 | **4** | **4** | **9.00** | **0.82** | **2.75** | **0.50** |
| **blacksmith, adult** | 8/8/2003 | **5** | **5** | **10.00** | **0.00** | **3.60** | **0.55** |
| **blacksmith, adult** | 9/12/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 8/8/2003 | **5** | **5** | **10.00** | **0.00** | **3.60** | **0.55** |
| **blacksmith, all** | 9/12/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, juvenile** | 8/8/2003 | **5** | **5** | **2.60** | **3.58** | **0.40** | **0.55** |
| **blacksmith, juvenile** | 9/12/2003 | **4** | **4** | **3.75** | **4.35** | **1.00** | **1.15** |
| **blue rockfish, adult** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 8/8/2003 | **5** | **5** | **1.80** | **4.02** | **0.20** | **0.45** |
| **blue-banded goby** | 9/12/2003 | **4** | **4** | **3.50** | **4.04** | **0.75** | **0.96** |
| **bocaccio, juvenile** | 8/8/2003 | **5** | **1** | **9.00** | | **2.00** | |
| **bocaccio, juvenile** | 9/12/2003 | **4** | **1** | **7.00** | | **2.00** | |
| **California scorpionfish** | 8/8/2003 | **5** | **1** | **9.00** | | **1.00** | |
| **California scorpionfish** | 9/12/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **California sheephead,** | 8/8/2003 | **5** | **5** | **10.00** | **0.00** | **2.00** | **0.00** |
| **California sheephead,** | 9/12/2003 | **4** | **4** | **10.00** | **0.00** | **2.25** | **0.50** |
| **California sheephead,** | 8/8/2003 | **5** | **5** | **1.80** | **4.02** | **0.40** | **0.89** |
| **California sheephead,** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/8/2003 | **5** | **5** | **9.60** | **0.89** | **2.00** | **0.00** |
| **California sheephead,** | 9/12/2003 | **4** | **4** | **6.25** | **4.35** | **1.50** | **1.00** |
| **garibaldi, adult** | 8/8/2003 | **5** | **5** | **9.80** | **0.45** | **2.40** | **0.55** |
| **garibaldi, adult** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **2.25** | **0.50** |
| **garibaldi, juvenile** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish** | 8/8/2003 | **5** | **2** | **9.50** | **0.71** | **1.50** | **0.71** |
| **giant kelpfish, juvenile** | 8/8/2003 | **5** | **3** | **6.00** | **1.00** | **1.67** | **0.58** |
| **giant kelpfish, juvenile** | 9/12/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **gopher/copper rockfish,** | 8/8/2003 | **5** | **4** | **8.00** | **2.16** | **1.75** | **0.50** |
| **gopher/copper rockfish,** | 9/12/2003 | **4** | **3** | **8.00** | **0.00** | **2.00** | **0.00** |
| **halfmoon** | 8/8/2003 | **5** | **4** | **7.50** | **2.08** | **1.50** | **0.58** |
| **halfmoon** | 9/12/2003 | **4** | **3** | **8.33** | **2.08** | **1.67** | **0.58** |
| **horn shark** | 9/12/2003 | **4** | **2** | **6.50** | **0.71** | **1.00** | **0.00** |
| **island kelpfish** | 8/8/2003 | **5** | **5** | **9.20** | **1.10** | **2.20** | **0.45** |
| **island kelpfish** | 9/12/2003 | **4** | **4** | **8.50** | **1.29** | **1.75** | **0.50** |
| **kelp bass, adult** | 8/8/2003 | **5** | **5** | **10.00** | **0.00** | **2.60** | **0.55** |
| **kelp bass, adult** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **kelp bass, calico bass, all** | 8/8/2003 | **5** | **5** | **10.00** | **0.00** | **2.60** | **0.55** |
| **kelp bass, calico bass, all** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **kelp bass, juvenile** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/8/2003 | **5** | **5** | **3.80** | **5.22** | **0.60** | **0.89** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelp rockfish, adult** | 9/12/2003 | **4** | **4** | **3.75** | **4.50** | **0.50** | **0.58** |
| **kelp rockfish, all** | 8/8/2003 | **5** | **5** | **6.80** | **3.96** | **1.60** | **1.14** |
| **kelp rockfish, all** | 9/12/2003 | **4** | **4** | **6.50** | **4.51** | **1.50** | **1.00** |
| **kelp rockfish, juvenile** | 8/8/2003 | **5** | **5** | **4.80** | **4.44** | **1.20** | **1.30** |
| **kelp rockfish, juvenile** | 9/12/2003 | **4** | **4** | **5.75** | **4.19** | **1.25** | **0.96** |
| **kelp surfperch** | 8/8/2003 | **5** | **5** | **9.40** | **0.89** | **2.60** | **0.55** |
| **kelp surfperch** | 9/12/2003 | **4** | **4** | **9.25** | **1.50** | **3.00** | **0.00** |
| **kelpfish spp.** | 8/8/2003 | **5** | **1** | **5.00** | | **1.00** | |
| **kelpfish spp.** | 9/12/2003 | **4** | **2** | **7.00** | **1.41** | **1.00** | **0.00** |
| **olive rockfish, adult** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 9/12/2003 | **4** | **4** | **4.00** | **4.90** | **0.50** | **0.58** |
| **olive/yellowtail rockfish,** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 9/12/2003 | **4** | **4** | **4.00** | **4.90** | **0.50** | **0.58** |
| **opaleye, adult** | 8/8/2003 | **5** | **5** | **9.20** | **1.10** | **3.20** | **0.45** |
| **opaleye, adult** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **opaleye, all** | 8/8/2003 | **5** | **5** | **9.20** | **1.10** | **3.20** | **0.45** |
| **opaleye, all** | 9/12/2003 | **4** | **4** | **9.75** | **0.50** | **3.00** | **0.00** |
| **opaleye, juvenile** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 8/8/2003 | **5** | **5** | **9.20** | **1.30** | **2.20** | **0.45** |
| **painted greenling** | 9/12/2003 | **4** | **4** | **9.00** | **1.41** | **2.50** | **0.58** |
| **pile surfperch, adult** | 8/8/2003 | **5** | **5** | **2.80** | **4.09** | **0.40** | **0.55** |
| **pile surfperch, adult** | 9/12/2003 | **4** | **4** | **3.00** | **3.56** | **0.75** | **0.96** |
| **pile surfperch, all** | 8/8/2003 | **5** | **5** | **2.80** | **4.09** | **0.40** | **0.55** |
| **pile surfperch, all** | 9/12/2003 | **4** | **4** | **3.00** | **3.56** | **0.75** | **0.96** |
| **pile surfperch, juvenile** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 8/8/2003 | **5** | **5** | **8.00** | **1.58** | **1.80** | **0.45** |
| **rock wrasse, female** | 9/12/2003 | **4** | **4** | **6.00** | **4.55** | **1.25** | **0.96** |
| **rock wrasse, male** | 8/8/2003 | **5** | **5** | **6.40** | **4.04** | **1.40** | **0.89** |
| **rock wrasse, male** | 9/12/2003 | **4** | **4** | **5.25** | **3.77** | **1.00** | **0.82** |
| **rubberlip surfperch** | 8/8/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **senorita, adult** | 8/8/2003 | **5** | **5** | **9.60** | **0.55** | **3.00** | **0.00** |
| **senorita, adult** | 9/12/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **senorita, all** | 8/8/2003 | **5** | **5** | **9.60** | **0.55** | **3.00** | **0.00** |
| **senorita, all** | 9/12/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **senorita, juvenile** | 8/8/2003 | **5** | **5** | **1.40** | **3.13** | **0.20** | **0.45** |
| **senorita, juvenile** | 9/12/2003 | **4** | **4** | **2.50** | **5.00** | **0.50** | **1.00** |
| **striped surfperch, adult** | 8/8/2003 | **5** | **5** | **3.00** | **4.24** | **0.60** | **0.89** |
| **striped surfperch, adult** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/8/2003 | **5** | **5** | **3.00** | **4.24** | **0.60** | **0.89** |
| **striped surfperch, all** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 9/12/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **top smelt** | 8/8/2003 | **5** | **1** | **8.00** | | **3.00** | |
| **top smelt** | 9/12/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **treefish, adult** | 8/8/2003 | **5** | **5** | **2.80** | **4.09** | **0.40** | **0.55** |
| **treefish, adult** | 9/12/2003 | **4** | **4** | **4.25** | **5.06** | **0.75** | **0.96** |
| **treefish, juvenile** | 8/8/2003 | **5** | **5** | **8.60** | **1.67** | **2.40** | **0.55** |
| **treefish, juvenile** | 9/12/2003 | **4** | **4** | **7.50** | **1.73** | **2.00** | **0.82** |
| **zebra goby** | 8/8/2003 | **5** | **2** | **7.50** | **3.54** | **2.50** | **0.71** |
| **zebra goby** | 9/12/2003 | **4** | **3** | **8.00** | **0.00** | **1.33** | **0.58** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, all** | 7/8/2003 | **5** | **5** | **3.00** | **4.12** | **0.40** | **0.55** |
| **black surfperch, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 7/8/2003 | **5** | **3** | **2.33** | **4.04** | **0.33** | **0.58** |
| **black surfperch, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 7/8/2003 | **5** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blackeye goby** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.75** | **0.50** |
| **blacksmith, adult** | 7/8/2003 | **5** | **3** | **8.67** | **0.58** | **3.33** | **0.58** |
| **blacksmith, adult** | 8/19/2003 | **4** | **4** | **9.25** | **0.96** | **2.75** | **0.50** |
| **blacksmith, all** | 7/8/2003 | **5** | **5** | **8.60** | **0.55** | **3.20** | **0.45** |
| **blacksmith, all** | 8/19/2003 | **4** | **4** | **9.25** | **0.96** | **2.75** | **0.50** |
| **blacksmith, juvenile** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 7/8/2003 | **5** | **5** | **1.40** | **3.13** | **0.20** | **0.45** |
| **blue rockfish, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 7/8/2003 | **5** | **3** | **2.33** | **4.04** | **0.33** | **0.58** |
| **blue rockfish, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/8/2003 | **5** | **5** | **5.20** | **4.76** | **0.60** | **0.55** |
| **California sheephead,** | 8/19/2003 | **4** | **4** | **4.00** | **4.69** | **0.75** | **0.96** |
| **California sheephead,** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **coralline sculpin** | 7/8/2003 | **5** | **1** | **7.00** | | **1.00** | |
| **garibaldi, adult** | 7/8/2003 | **5** | **5** | **6.60** | **3.78** | **1.40** | **0.89** |
| **garibaldi, adult** | 8/19/2003 | **4** | **4** | **8.50** | **1.29** | **1.50** | **0.58** |
| **garibaldi, juvenile** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish** | 7/8/2003 | **5** | **1** | **5.00** | | **1.00** | |
| **giant kelpfish** | 8/19/2003 | **4** | **1** | **5.00** | | **1.00** | |
| **giant kelpfish, juvenile** | 8/19/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **gopher/copper rockfish,** | 7/8/2003 | **5** | **5** | **8.60** | **0.55** | **2.40** | **0.89** |
| **gopher/copper rockfish,** | 8/19/2003 | **4** | **3** | **8.67** | **1.15** | **2.00** | **0.00** |
| **halfmoon** | 8/19/2003 | **4** | **1** | **10.00** | | **1.00** | |
| **island kelpfish** | 7/8/2003 | **5** | **5** | **4.60** | **4.28** | **0.80** | **0.84** |
| **island kelpfish** | 8/19/2003 | **4** | **4** | **9.25** | **0.96** | **2.25** | **0.50** |
| **kelp bass, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 8/19/2003 | **4** | **4** | **8.00** | **2.16** | **1.25** | **0.50** |
| **kelp bass, calico bass, all** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, calico bass, all** | 8/19/2003 | **4** | **4** | **8.00** | **2.16** | **1.25** | **0.50** |
| **kelp bass, juvenile** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, all** | 7/8/2003 | **5** | **5** | **3.20** | **4.38** | **0.60** | **0.89** |
| **kelp rockfish, all** | 8/19/2003 | **4** | **4** | **4.00** | **4.62** | **0.50** | **0.58** |
| **kelp rockfish, juvenile** | 7/8/2003 | **5** | **3** | **5.33** | **4.62** | **1.00** | **1.00** |
| **kelp rockfish, juvenile** | 8/19/2003 | **4** | **4** | **4.00** | **4.62** | **0.50** | **0.58** |
| **kelp surfperch** | 8/19/2003 | **4** | **1** | **7.00** | | **2.00** | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelpfish spp.** | 8/19/2003 | **4** | **1** | **6.00** | | **2.00** | |
| **ocean whitefish** | 7/8/2003 | **5** | **5** | **9.40** | **1.34** | **1.80** | **0.45** |
| **ocean whitefish** | 8/19/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **olive rockfish, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 7/8/2003 | **5** | **5** | **1.40** | **3.13** | **0.60** | **1.34** |
| **olive rockfish, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 7/8/2003 | **5** | **3** | **2.33** | **4.04** | **1.00** | **1.73** |
| **olive/yellowtail rockfish,** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 8/19/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **opaleye, all** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 8/19/2003 | **4** | **4** | **1.75** | **3.50** | **0.25** | **0.50** |
| **opaleye, juvenile** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/8/2003 | **5** | **5** | **9.40** | **0.55** | **2.00** | **0.00** |
| **painted greenling** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **pile surfperch, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, adult** | 8/19/2003 | **4** | **4** | **6.00** | **4.55** | **0.75** | **0.50** |
| **pile surfperch, all** | 7/8/2003 | **5** | **5** | **1.40** | **3.13** | **0.20** | **0.45** |
| **pile surfperch, all** | 8/19/2003 | **4** | **4** | **6.00** | **4.55** | **0.75** | **0.50** |
| **pile surfperch, juvenile** | 7/8/2003 | **5** | **3** | **2.33** | **4.04** | **0.33** | **0.58** |
| **pile surfperch, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 8/19/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **rock wrasse, male** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, adult** | 7/8/2003 | **5** | **3** | **9.67** | **0.58** | **4.00** | **0.00** |
| **senorita, adult** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **senorita, all** | 7/8/2003 | **5** | **5** | **9.60** | **0.55** | **3.80** | **0.45** |
| **senorita, all** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **senorita, juvenile** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 8/19/2003 | **4** | **2** | **7.50** | **2.12** | **1.50** | **0.71** |
| **speckled sanddab** | 7/8/2003 | **5** | **1** | **6.00** | | **1.00** | |
| **striped surfperch, adult** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/8/2003 | **5** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 7/8/2003 | **5** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 7/8/2003 | **5** | **5** | **2.60** | **3.58** | **0.40** | **0.55** |
| **treefish, juvenile** | 8/19/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **tubesnout** | 7/8/2003 | **5** | **2** | **9.00** | **1.41** | **3.00** | **0.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 7/9/2003 | **4** | **4** | **5.50** | **4.20** | **0.75** | **0.50** |
| **black surfperch, adult** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, all** | 7/9/2003 | **4** | **4** | **5.50** | **4.20** | **0.75** | **0.50** |
| **black surfperch, all** | 8/19/2003 | **6** | **6** | **1.00** | **2.45** | **0.17** | **0.41** |
| **black surfperch, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 8/19/2003 | **6** | **6** | **1.00** | **2.45** | **0.17** | **0.41** |
| **blackeye goby** | 7/9/2003 | **4** | **4** | **9.00** | **1.41** | **2.75** | **0.50** |
| **blackeye goby** | 8/19/2003 | **6** | **6** | **8.83** | **1.17** | **3.17** | **0.41** |
| **blacksmith, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, adult** | 8/19/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 8/19/2003 | **6** | **6** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 8/19/2003 | **6** | **6** | **1.17** | **2.86** | **0.17** | **0.41** |
| **blue rockfish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/9/2003 | **4** | **4** | **9.25** | **0.50** | **2.00** | **0.00** |
| **California sheephead,** | 8/19/2003 | **6** | **6** | **6.83** | **3.49** | **1.67** | **0.82** |
| **California sheephead,** | 7/9/2003 | **4** | **4** | **4.00** | **4.62** | **0.50** | **0.58** |
| **California sheephead,** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/9/2003 | **4** | **4** | **5.50** | **4.04** | **1.00** | **0.82** |
| **California sheephead,** | 8/19/2003 | **6** | **6** | **6.00** | **3.41** | **1.17** | **0.75** |
| **coralline sculpin** | 7/9/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **garibaldi, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **garibaldi, adult** | 8/19/2003 | **6** | **6** | **10.00** | **0.00** | **3.00** | **0.00** |
| **garibaldi, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish** | 8/19/2003 | **6** | **2** | **8.50** | **0.71** | **1.00** | **0.00** |
| **gopher rockfish** | 7/9/2003 | **4** | **1** | **6.00** | | **1.00** | |
| **gopher/copper rockfish,** | 7/9/2003 | **4** | **1** | **8.00** | | **1.00** | |
| **gopher/copper rockfish,** | 8/19/2003 | **6** | **2** | **6.50** | **0.71** | **1.00** | **0.00** |
| **grass rockfish** | 8/19/2003 | **6** | **1** | **9.00** | | **1.00** | |
| **halfmoon** | 7/9/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **halfmoon** | 8/19/2003 | **6** | **6** | **8.33** | **1.37** | **2.00** | **0.00** |
| **island kelpfish** | 7/9/2003 | **4** | **4** | **9.75** | **0.50** | **2.75** | **0.50** |
| **island kelpfish** | 8/19/2003 | **6** | **6** | **9.50** | **0.55** | **3.00** | **0.00** |
| **kelp bass, adult** | 7/9/2003 | **4** | **4** | **7.50** | **2.89** | **1.50** | **0.58** |
| **kelp bass, adult** | 8/19/2003 | **6** | **6** | **8.33** | **1.63** | **2.17** | **0.41** |
| **kelp bass, calico bass, all** | 7/9/2003 | **4** | **4** | **7.50** | **2.89** | **1.50** | **0.58** |
| **kelp bass, calico bass, all** | 8/19/2003 | **6** | **6** | **8.33** | **1.63** | **2.17** | **0.41** |
| **kelp bass, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, all** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **kelpfish spp.** | 7/9/2003 | **4** | **1** | **7.00** | | **1.00** | |
| **kelpfish spp.** | 8/19/2003 | **6** | **1** | **9.00** | | **1.00** | |
| **olive rockfish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **opaleye, adult** | 8/19/2003 | **6** | **6** | **9.67** | **0.52** | **3.00** | **0.00** |
| **opaleye, all** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **opaleye, all** | 8/19/2003 | **6** | **6** | **9.67** | **0.52** | **3.00** | **0.00** |
| **opaleye, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/9/2003 | **4** | **4** | **9.75** | **0.50** | **2.50** | **0.58** |
| **painted greenling** | 8/19/2003 | **6** | **6** | **9.83** | **0.41** | **2.83** | **0.41** |
| **pile surfperch, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, adult** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, male** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **senorita, adult** | 8/19/2003 | **6** | **6** | **9.50** | **0.84** | **2.83** | **0.41** |
| **senorita, all** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.25** | **0.50** |
| **senorita, all** | 8/19/2003 | **6** | **6** | **9.50** | **0.84** | **2.83** | **0.41** |
| **senorita, juvenile** | 7/9/2003 | **4** | **4** | **6.50** | **4.51** | **2.00** | **1.41** |
| **senorita, juvenile** | 8/19/2003 | **6** | **6** | **3.00** | **4.69** | **0.67** | **1.03** |
| **snubnose sculpin** | 7/9/2003 | **4** | **2** | **10.00** | **0.00** | **2.00** | **0.00** |
| **snubnose sculpin** | 8/19/2003 | **6** | **4** | **8.50** | **1.73** | **2.25** | **0.50** |
| **striped surfperch, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/19/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 8/19/2003 | **6** | **6** | **0.83** | **2.04** | **0.17** | **0.41** |
| **treefish, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 8/19/2003 | **6** | **6** | **2.33** | **3.67** | **0.33** | **0.52** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **bat ray** | 7/9/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **black surfperch, adult** | 7/9/2003 | **4** | **4** | **8.50** | **1.91** | **1.75** | **0.50** |
| **black surfperch, adult** | 8/19/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **black surfperch, all** | 7/9/2003 | **4** | **4** | **8.50** | **1.91** | **1.75** | **0.50** |
| **black surfperch, all** | 8/19/2003 | **4** | **4** | **2.00** | **4.00** | **0.25** | **0.50** |
| **black surfperch, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 7/9/2003 | **4** | **4** | **9.25** | **1.50** | **2.50** | **0.58** |
| **blackeye goby** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.00** | **0.00** |
| **blacksmith, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, adult** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.75** | **0.50** |
| **blacksmith, all** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **4.00** | **0.00** |
| **blacksmith, all** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.75** | **0.50** |
| **blacksmith, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/9/2003 | **4** | **4** | **9.50** | **1.00** | **2.00** | **0.00** |
| **California sheephead,** | 8/19/2003 | **4** | **4** | **8.50** | **1.29** | **1.75** | **0.50** |
| **California sheephead,** | 7/9/2003 | **4** | **4** | **3.75** | **4.35** | **0.50** | **0.58** |
| **California sheephead,** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 7/9/2003 | **4** | **4** | **2.50** | **5.00** | **0.25** | **0.50** |
| **California sheephead,** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **fringehead spp.** | 8/19/2003 | **4** | **1** | **9.00** | | **2.00** | |
| **garibaldi, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **garibaldi, adult** | 8/19/2003 | **4** | **4** | **9.75** | **0.50** | **2.25** | **0.50** |
| **garibaldi, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **garibaldi, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **giant kelpfish, juvenile** | 8/19/2003 | **4** | **1** | **9.00** | | **1.00** | |
| **grass rockfish** | 7/9/2003 | **4** | **1** | **10.00** | | **1.00** | |
| **halfmoon** | 7/9/2003 | **4** | **3** | **9.00** | **1.73** | **2.00** | **0.00** |
| **halfmoon** | 8/19/2003 | **4** | **4** | **9.25** | **1.50** | **1.75** | **0.50** |
| **island kelpfish** | 7/9/2003 | **4** | **4** | **9.50** | **0.58** | **3.00** | **0.82** |
| **island kelpfish** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **kelp bass, adult** | 7/9/2003 | **4** | **4** | **7.25** | **4.86** | **1.50** | **1.00** |
| **kelp bass, adult** | 8/19/2003 | **4** | **4** | **7.00** | **1.41** | **1.75** | **0.50** |
| **kelp bass, calico bass, all** | 7/9/2003 | **4** | **4** | **7.25** | **4.86** | **1.50** | **1.00** |
| **kelp bass, calico bass, all** | 8/19/2003 | **4** | **4** | **7.00** | **1.41** | **1.75** | **0.50** |
| **kelp bass, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 7/9/2003 | **4** | **4** | **8.25** | **2.36** | **1.25** | **0.50** |
| **kelp rockfish, adult** | 8/19/2003 | **4** | **4** | **1.25** | **2.50** | **0.25** | **0.50** |
| **kelp rockfish, all** | 7/9/2003 | **4** | **4** | **8.25** | **2.36** | **1.25** | **0.50** |
| **kelp rockfish, all** | 8/19/2003 | **4** | **4** | **1.25** | **2.50** | **0.25** | **0.50** |
| **kelp rockfish, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **olive rockfish, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **opaleye, adult** | 8/19/2003 | **4** | **4** | **8.75** | **0.96** | **2.00** | **0.00** |
| **opaleye, all** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **2.75** | **0.50** |
| **opaleye, all** | 8/19/2003 | **4** | **4** | **8.75** | **0.96** | **2.00** | **0.00** |
| **opaleye, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 7/9/2003 | **4** | **4** | **8.75** | **1.26** | **2.25** | **0.50** |
| **painted greenling** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **2.50** | **0.58** |
| **pile surfperch, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 7/9/2003 | **4** | **4** | **6.00** | **4.08** | **1.00** | **0.82** |
| **rock wrasse, female** | 8/19/2003 | **4** | **4** | **5.25** | **3.59** | **1.00** | **0.82** |
| **rock wrasse, male** | 7/9/2003 | **4** | **4** | **8.25** | **0.96** | **1.25** | **0.50** |
| **rock wrasse, male** | 8/19/2003 | **4** | **4** | **4.25** | **5.06** | **1.00** | **1.15** |
| **senorita, adult** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **senorita, adult** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **senorita, all** | 7/9/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **senorita, all** | 8/19/2003 | **4** | **4** | **10.00** | **0.00** | **3.50** | **0.58** |
| **senorita, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **senorita, juvenile** | 8/19/2003 | **4** | **4** | **2.25** | **4.50** | **0.50** | **1.00** |
| **snubnose sculpin** | 7/9/2003 | **4** | **2** | **6.50** | **2.12** | **1.00** | **0.00** |
| **snubnose sculpin** | 8/19/2003 | **4** | **3** | **9.00** | **1.00** | **2.00** | **0.00** |
| **striped surfperch, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **top smelt** | 7/9/2003 | **4** | **1** | **10.00** | | **2.00** | |
| **treefish, adult** | 7/9/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 8/19/2003 | **4** | **4** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 7/9/2003 | **4** | **4** | **1.50** | **3.00** | **0.25** | **0.50** |
| **treefish, juvenile** | 8/19/2003 | **4** | **4** | **1.25** | **2.50** | **0.25** | **0.50** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **black surfperch, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 5/30/2003 | **6** | **6** | **2.67** | **4.32** | **0.33** | **0.52** |
| **blacksmith, adult** | 5/30/2003 | **6** | **3** | **8.00** | **2.65** | **2.33** | **0.58** |
| **blacksmith, all** | 5/30/2003 | **6** | **6** | **5.50** | **4.59** | **1.50** | **1.22** |
| **blacksmith, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California scorpionfish** | 5/30/2003 | **6** | **1** | **5.00** | | **1.00** | |
| **California sheephead,** | 5/30/2003 | **6** | **6** | **10.00** | **0.00** | **2.67** | **0.52** |
| **California sheephead,** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California sheephead,** | 5/30/2003 | **6** | **6** | **9.67** | **0.52** | **2.67** | **0.52** |
| **garibaldi, adult** | 5/30/2003 | **6** | **6** | **9.83** | **0.41** | **2.00** | **0.00** |
| **garibaldi, juvenile** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 5/30/2003 | **6** | **3** | **9.00** | **0.00** | **2.00** | **0.00** |
| **kelp bass, calico bass, all** | 5/30/2003 | **6** | **6** | **9.50** | **0.55** | **2.17** | **0.41** |
| **kelp bass, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive rockfish, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **olive/yellowtail rockfish,** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 5/30/2003 | **6** | **1** | **7.00** | | **1.00** | |
| **pile surfperch, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 5/30/2003 | **6** | **6** | **2.00** | **3.16** | **0.50** | **0.84** |
| **rock wrasse, male** | 5/30/2003 | **6** | **6** | **3.00** | **4.65** | **0.50** | **0.84** |
| **sculpin spp.** | 5/30/2003 | **6** | **1** | **7.00** | | **1.00** | |
| **senorita, adult** | 5/30/2003 | **6** | **3** | **8.67** | **1.15** | **2.00** | **0.00** |
| **senorita, all** | 5/30/2003 | **6** | **6** | **8.50** | **0.84** | **2.00** | **0.00** |
| **senorita, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 5/30/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, juvenile** | 5/30/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 5/29/2003 | **6** | **3** | **9.00** | **1.00** | **2.00** | **0.00** |
| **black surfperch, all** | 5/29/2003 | **6** | **6** | **5.50** | **4.46** | **1.17** | **0.98** |
| **black surfperch, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 5/29/2003 | **6** | **6** | **8.00** | **3.95** | **2.00** | **1.10** |
| **blacksmith, adult** | 5/29/2003 | **6** | **3** | **9.67** | **0.58** | **3.00** | **0.00** |
| **blacksmith, all** | 5/29/2003 | **6** | **6** | **9.00** | **2.00** | **2.67** | **0.52** |
| **blacksmith, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 5/29/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 5/29/2003 | **6** | **6** | **6.83** | **3.60** | **1.83** | **0.98** |
| **California scorpionfish** | 5/29/2003 | **6** | **3** | **6.67** | **2.89** | **1.00** | **0.00** |
| **California sheephead,** | 5/29/2003 | **6** | **6** | **9.67** | **0.52** | **2.67** | **0.52** |
| **California sheephead,** | 5/29/2003 | **6** | **6** | **8.67** | **1.75** | **1.83** | **0.75** |
| **California sheephead,** | 5/29/2003 | **6** | **6** | **6.83** | **3.49** | **1.67** | **0.82** |
| **garibaldi, adult** | 5/29/2003 | **6** | **6** | **10.00** | **0.00** | **3.00** | **0.00** |
| **garibaldi, juvenile** | 5/29/2003 | **6** | **6** | **1.50** | **3.67** | **0.17** | **0.41** |
| **giant kelpfish** | 5/29/2003 | **6** | **2** | **6.50** | **0.71** | **1.00** | **0.00** |
| **island kelpfish** | 5/29/2003 | **6** | **6** | **1.67** | **4.08** | **0.33** | **0.82** |
| **kelp bass, adult** | 5/29/2003 | **6** | **3** | **10.00** | **0.00** | **3.00** | **0.00** |
| **kelp bass, calico bass, all** | 5/29/2003 | **6** | **6** | **10.00** | **0.00** | **2.83** | **0.41** |
| **kelp bass, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 5/29/2003 | **6** | **3** | **10.00** | **0.00** | **3.00** | **0.00** |
| **kelp rockfish, all** | 5/29/2003 | **6** | **6** | **9.83** | **0.41** | **2.83** | **0.41** |
| **kelp rockfish, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp surfperch** | 5/29/2003 | **6** | **6** | **9.33** | **1.21** | **2.67** | **0.52** |
| **olive rockfish, adult** | 5/29/2003 | **6** | **3** | **3.00** | **5.20** | **0.33** | **0.58** |
| **olive rockfish, all** | 5/29/2003 | **6** | **6** | **6.33** | **4.93** | **0.83** | **0.75** |
| **olive/yellowtail rockfish,** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 5/29/2003 | **6** | **3** | **1.67** | **2.89** | **0.33** | **0.58** |
| **opaleye, all** | 5/29/2003 | **6** | **6** | **0.83** | **2.04** | **0.17** | **0.41** |
| **opaleye, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, adult** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 5/29/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 5/29/2003 | **6** | **6** | **6.00** | **4.90** | **1.33** | **1.03** |
| **rock wrasse, male** | 5/29/2003 | **6** | **6** | **7.00** | **3.90** | **1.33** | **0.82** |
| **senorita, adult** | 5/29/2003 | **6** | **3** | **9.00** | **1.00** | **3.00** | **0.00** |
| **senorita, all** | 5/29/2003 | **6** | **6** | **9.00** | **0.89** | **3.00** | **0.00** |
| **senorita, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 5/29/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 5/29/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 5/29/2003 | **6** | **6** | **1.00** | **2.45** | **0.17** | **0.41** |
| **treefish, juvenile** | 5/29/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **zebra goby** | 5/29/2003 | **6** | **1** | **6.00** | | **2.00** | |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **bat ray** | 5/28/2003 | **6** | **2** | **9.00** | **0.00** | **1.00** | **0.00** |
| **black surfperch, adult** | 5/28/2003 | **6** | **3** | **5.33** | **4.62** | **1.33** | **1.15** |
| **black surfperch, all** | 5/28/2003 | **6** | **6** | **6.83** | **3.37** | **1.33** | **0.82** |
| **black surfperch, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blackeye goby** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blacksmith, adult** | 5/28/2003 | **6** | **3** | **6.67** | **5.77** | **2.00** | **1.73** |
| **blacksmith, all** | 5/28/2003 | **6** | **6** | **4.17** | **4.92** | **1.17** | **1.47** |
| **blacksmith, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **cabezon** | 5/28/2003 | **6** | **1** | **9.00** | | **1.00** | |
| **California sheephead,** | 5/28/2003 | **6** | **6** | **9.00** | **1.26** | **2.50** | **0.55** |
| **California sheephead,** | 5/28/2003 | **6** | **6** | **2.33** | **3.83** | **0.33** | **0.52** |
| **California sheephead,** | 5/28/2003 | **6** | **6** | **8.33** | **1.21** | **1.83** | **0.41** |
| **garibaldi, adult** | 5/28/2003 | **6** | **6** | **8.50** | **1.76** | **1.83** | **0.41** |
| **garibaldi, juvenile** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **island kelpfish** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp bass, adult** | 5/28/2003 | **6** | **3** | **8.33** | **1.15** | **3.00** | **0.00** |
| **kelp bass, calico bass, all** | 5/28/2003 | **6** | **6** | **9.00** | **1.10** | **3.00** | **0.00** |
| **kelp bass, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 5/28/2003 | **6** | **3** | **5.33** | **4.73** | **1.33** | **1.15** |
| **kelp rockfish, all** | 5/28/2003 | **6** | **6** | **4.17** | **4.62** | **0.83** | **0.98** |
| **kelp rockfish, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp surfperch** | 5/28/2003 | **6** | **1** | **7.00** | | **2.00** | |
| **olive rockfish, adult** | 5/28/2003 | **6** | **3** | **4.67** | **4.04** | **1.00** | **1.00** |
| **olive rockfish, all** | 5/28/2003 | **6** | **6** | **2.33** | **3.61** | **0.50** | **0.84** |
| **olive/yellowtail rockfish,** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, all** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **painted greenling** | 5/28/2003 | **6** | **2** | **10.00** | **0.00** | **1.50** | **0.71** |
| **pile surfperch, adult** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rock wrasse, female** | 5/28/2003 | **6** | **6** | **1.33** | **3.27** | **0.17** | **0.41** |
| **rock wrasse, male** | 5/28/2003 | **6** | **6** | **3.33** | **4.08** | **0.50** | **0.55** |
| **senorita, adult** | 5/28/2003 | **6** | **3** | **9.67** | **0.58** | **2.67** | **0.58** |
| **senorita, all** | 5/28/2003 | **6** | **6** | **8.33** | **1.97** | **2.67** | **0.52** |
| **senorita, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, adult** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 5/28/2003 | **6** | **3** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 5/28/2003 | **6** | **6** | **1.17** | **2.86** | **0.17** | **0.41** |
| **treefish, juvenile** | 5/28/2003 | **6** | **6** | **0.00** | **0.00** | **0.00** | **0.00** |

| CommonName: | Date: | Maximum# of Observers: | # of Observations: | Avg Score: | StDev Score: | Avg Abundance: | StDev Abundance: |
|---|---|---|---|---|---|---|---|
| **black surfperch, adult** | 6/1/2003 | **7** | **5** | **9.60** | **0.55** | **2.00** | **0.71** |
| **black surfperch, all** | 6/1/2003 | **7** | **7** | **8.29** | **3.68** | **1.71** | **0.95** |
| **black surfperch, juvenile** | 6/1/2003 | **7** | **5** | **1.80** | **4.02** | **0.40** | **0.89** |
| **blackeye goby** | 6/1/2003 | **7** | **7** | **6.14** | **4.30** | **1.43** | **0.98** |
| **blacksmith, adult** | 6/1/2003 | **7** | **5** | **8.00** | **1.58** | **2.60** | **1.14** |
| **blacksmith, all** | 6/1/2003 | **7** | **7** | **7.14** | **3.48** | **2.29** | **1.38** |
| **blacksmith, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, adult** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, all** | 6/1/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue rockfish, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **blue-banded goby** | 6/1/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **California scorpionfish** | 6/1/2003 | **7** | **4** | **8.25** | **0.96** | **1.25** | **0.50** |
| **California sheephead,** | 6/1/2003 | **7** | **7** | **10.00** | **0.00** | **2.86** | **0.38** |
| **California sheephead,** | 6/1/2003 | **7** | **7** | **1.29** | **3.40** | **0.14** | **0.38** |
| **California sheephead,** | 6/1/2003 | **7** | **7** | **10.00** | **0.00** | **3.00** | **0.00** |
| **garibaldi, adult** | 6/1/2003 | **7** | **7** | **10.00** | **0.00** | **3.00** | **0.00** |
| **garibaldi, juvenile** | 6/1/2003 | **7** | **7** | **1.43** | **3.78** | **0.29** | **0.76** |
| **island kelpfish** | 6/1/2003 | **7** | **7** | **2.14** | **3.76** | **0.43** | **0.79** |
| **jack mackerel** | 6/1/2003 | **7** | **2** | **10.00** | **0.00** | **2.00** | **0.00** |
| **kelp bass, adult** | 6/1/2003 | **7** | **5** | **10.00** | **0.00** | **3.00** | **0.00** |
| **kelp bass, calico bass, all** | 6/1/2003 | **7** | **7** | **10.00** | **0.00** | **3.00** | **0.00** |
| **kelp bass, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **kelp rockfish, adult** | 6/1/2003 | **7** | **5** | **7.80** | **1.30** | **1.80** | **0.45** |
| **kelp rockfish, all** | 6/1/2003 | **7** | **7** | **7.29** | **1.50** | **1.57** | **0.53** |
| **kelp rockfish, juvenile** | 6/1/2003 | **7** | **5** | **3.20** | **4.38** | **0.60** | **0.89** |
| **kelp surfperch** | 6/1/2003 | **7** | **3** | **8.00** | **1.73** | **1.67** | **0.58** |
| **olive rockfish, adult** | 6/1/2003 | **7** | **5** | **5.00** | **4.69** | **0.60** | **0.55** |
| **olive rockfish, all** | 6/1/2003 | **7** | **7** | **3.57** | **4.54** | **0.43** | **0.53** |
| **olive/yellowtail rockfish,** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **opaleye, adult** | 6/1/2003 | **7** | **5** | **2.00** | **4.47** | **0.20** | **0.45** |
| **opaleye, all** | 6/1/2003 | **7** | **7** | **1.43** | **3.78** | **0.14** | **0.38** |
| **opaleye, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **Pacific sardine** | 6/1/2003 | **7** | **2** | **10.00** | **0.00** | **3.00** | **0.00** |
| **painted greenling** | 6/1/2003 | **7** | **2** | **7.50** | **0.71** | **1.00** | **0.00** |
| **pile surfperch, adult** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, all** | 6/1/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **pile surfperch, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **rainbow surfperch** | 6/1/2003 | **7** | **1** | **6.00** | | **1.00** | |
| **rock wrasse, female** | 6/1/2003 | **7** | **7** | **7.14** | **3.44** | **1.43** | **0.79** |
| **rock wrasse, male** | 6/1/2003 | **7** | **7** | **4.14** | **4.06** | **1.00** | **1.00** |
| **rubberlip surfperch** | 6/1/2003 | **7** | **2** | **8.50** | **0.71** | **1.50** | **0.71** |
| **senorita, adult** | 6/1/2003 | **7** | **5** | **10.00** | **0.00** | **2.80** | **0.45** |
| **senorita, all** | 6/1/2003 | **7** | **7** | **10.00** | **0.00** | **2.86** | **0.69** |
| **senorita, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **snubnose sculpin** | 6/1/2003 | **7** | **1** | **6.00** | | **1.00** | |
| **striped surfperch, adult** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, all** | 6/1/2003 | **7** | **7** | **0.00** | **0.00** | **0.00** | **0.00** |
| **striped surfperch, juvenile** | 6/1/2003 | **7** | **5** | **0.00** | **0.00** | **0.00** | **0.00** |
| **treefish, adult** | 6/1/2003 | **7** | **7** | **4.86** | **4.60** | **0.57** | **0.53** |
| **treefish, juvenile** | 6/1/2003 | **7** | **7** | **1.29** | **3.40** | **0.14** | **0.38** |

# Appendix G: Natural Habitat Size Frequencies Distributions

## 2003 Natural Habitat Size Frequency Distributions



## San Miguel Island - Wyckoff Ledge

*Tethya aurantia*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **11.5%** |
| **40 - 49** | **11.5%** |
| **50 - 59** | **19.7%** |
| **60 - 69** | **9.8%** |
| **70 - 79** | **24.6%** |
| **80 - 89** | **8.2%** |
| **90 - 99** | **8.2%** |
| **> 99** | **6.6%** |
| **(Cases) N=** | **61** |
| **mean** | **66** |
| **min size (mm)** | **30** |
| **max size (mm)** | **112** |

*Kelletia kelletii*

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **3.3%** |
| **70 - 79** | **28.3%** |
| **80 - 89** | **28.3%** |
| **90 - 99** | **33.3%** |
| **100 - 109** | **6.7%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **60** |
| **mean** | **86** |
| **min size (mm)** | **61** |
| **max size (mm)** | **104** |

*Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **16.9%** |
| **60 - 69** | **44.1%** |
| **70 - 79** | **32.2%** |
| **80 - 89** | **5.1%** |
| **90 - 99** | **1.7%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **59** |
| **mean** | **67** |
| **min size (mm)** | **51** |
| **max size (mm)** | **92** |

*Haliotis rufescens*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **1.4%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **1.4%** |
| **85 - 94** | **6.9%** |
| **95 - 104** | **1.4%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **4.2%** |
| **125 - 134** | **5.6%** |
| **135 - 144** | **2.8%** |
| **145 - 154** | **5.6%** |
| **155 - 164** | **11.1%** |
| **165 - 174** | **11.1%** |
| **175 - 184** | **15.3%** |
| **185 - 194** | **18.1%** |
| **>195** | **13.9%** |
| **(Cases) N=** | **72** |
| **mean** | **163** |
| **min size (mm)** | **42** |
| **max size (mm)** | **212** |

*Lithopoma gibberosum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **4.2%** |
| **40 - 49** | **45.8%** |
| **50 - 59** | **39.6%** |
| **60 - 69** | **10.4%** |
| **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=** | **48** |
| **mean** | **50** |
| **mean** | **50** |
| **min size (mm)** | **30** |
| **max size (mm)** | **63** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **13.0%** |
| **40 - 59** | **30.4%** |
| **60 - 79** | **43.5%** |
| **80 - 99** | **13.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **23** |
| **mean** | **62** |
| **min size (mm)** | **mean38** |
| **min size (mm)** | **38** |
| **max size (mm)** | **98** |

# 2003 Natural Habitat Size Frequency Distributions

## San Miguel Island - Wyckoff Ledge

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 16.7% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 33.3% |
| 80 - 99 | 16.7% |
| 100 - 119 | 0.0% |
| 120 - 139 | 0.0% |
| 140 - 159 | 0.0% |
| 160 - 179 | 0.0% |
| 180 - 199 | 16.7% |
| 200 - 219 | 0.0% |
| 220 - 239 | 16.7% |
| 240 - 259 | 0.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| (Cases) N= | 6 |
| mean | 110 |
| min size (mm) | 17 |
| max size (mm) | 220 |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 3.8% |
| 10 - 14 | 7.7% |
| 15 - 19 | 26.9% |
| 20 - 24 | 26.9% |
| 25 - 29 | 15.4% |
| 30 - 34 | 7.7% |
| 35 - 39 | 7.7% |
| 40 - 44 | 3.8% |
| 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= | 26 |
| mean | 23 |
| min size (mm) | 7 |
| max size (mm) | 41 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 0.0% |
| 10 - 14 | 0.0% |
| 15 - 19 | 2.5% |
| 20 - 24 | 4.9% |
| 25 - 29 | 13.8% |
| 30 - 34 | 5.9% |
| 35 - 39 | 3.9% |
| 40 - 44 | 2.0% |
| 45 - 49 | 3.4% |
| 50 - 54 | 1.5% |
| 55 - 59 | 2.0% |
| 60 - 64 | 3.4% |
| 65 - 69 | 3.0% |
| 70 - 74 | 7.9% |
| 75 - 79 | 7.4% |
| 80 - 84 | 10.3% |
| 85 - 89 | 11.3% |
| 90 - 94 | 6.4% |
| 95 - 99 | 3.9% |
| 100 - 104 | 3.0% |
| 105 - 109 | 2.5% |
| > 109 | 1.0% |
| (Cases) N= | 203 |
| mean | 63 |
| min size (mm) | 16 |
| max size (mm) | 114 |

# 2003 Natural Habitat Size Frequency Distributions

## San Miguel Island - Hare Rock

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 1.0% |
| 20 - 29 | 7.0% |
| 30 - 39 | 10.0% |
| 40 - 49 | 19.0% |
| 50 - 59 | 26.0% |
| 60 - 69 | 19.0% |
| 70 - 79 | 10.0% |
| 80 - 89 | 6.0% |
| 90 - 99 | 2.0% |
| > 99 | 0.0% |
| (Cases) N= | 100 |
| mean | 55 |
| min size (mm) | 17 |
| max size (mm) | 94 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.9% |
| 20 - 39 | 0.0% |
| 40 - 59 | 1.9% |
| 60 - 79 | 29.6% |
| 80 - 99 | 33.3% |
| 100 - 119 | 25.0% |
| 120 - 139 | 5.6% |
| 140 - 159 | 3.7% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 108 |
| mean | 91 |
| min size (mm) | 6 |
| max size (mm) | 155 |

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 4.8% |
| 80 - 99 | 19.0% |
| 100 - 119 | 9.5% |
| 120 - 139 | 23.8% |
| 140 - 159 | 23.8% |
| 160 - 179 | 0.0% |
| 180 - 199 | 9.5% |
| 200 - 219 | 9.5% |
| 220 - 239 | 0.0% |
| 240 - 259 | 0.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| (Cases) N= | 21 |
| mean | 135 |
| min size (mm) | 72 |
| max size (mm) | 212 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 1.0% |
| 10 - 14 | 1.5% |
| 15 - 19 | 5.0% |
| 20 - 24 | 5.0% |
| 25 - 29 | 5.4% |
| 30 - 34 | 5.9% |
| 35 - 39 | 3.5% |
| 40 - 44 | 1.5% |
| 45 - 49 | 2.0% |
| 50 - 54 | 3.5% |
| 55 - 59 | 2.5% |
| 60 - 64 | 5.0% |
| 65 - 69 | 7.9% |
| 70 - 74 | 13.4% |
| 75 - 79 | 8.9% |
| 80 - 84 | 12.9% |
| 85 - 89 | 5.9% |
| 90 - 94 | 4.5% |
| 95 - 99 | 3.0% |
| 100 - 104 | 1.0% |
| 105 - 109 | 1.0% |
| > 109 | 0.0% |
| (Cases) N= | 202 |
| mean | 61 |
| min size (mm) | 7 |
| max size (mm) | 106 |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 6.3% |
| 10 - 14 | 16.7% |
| 15 - 19 | 18.8% |
| 20 - 24 | 25.0% |
| 25 - 29 | 14.6% |
| 30 - 34 | 6.3% |
| 35 - 39 | 6.3% |
| 40 - 44 | 2.1% |
| 45 - 49 | 4.2% |
| 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= | 48 |
| mean | 22 |
| min size (mm) | 6 |
| max size (mm) | 49 |

## Santa Rosa Island - Johnson's Lee North

*Tethya aurantia*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 7.4% |
| 40 - 49 | 2.9% |
| 50 - 59 | 8.8% |
| 60 - 69 | 13.2% |
| 70 - 79 | 11.8% |
| 80 - 89 | 20.6% |
| 90 - 99 | 20.6% |
| > 99 | 14.7% |
| (Cases) N= | 68 |
| mean | 80 |
| min size (mm) | 30 |
| max size (mm) | 115 |

*Haliotis rufescens*

| | |
|---|---|
| <25 | 0.0% |
| 25 - 34 | 0.0% |
| 35 - 44 | 33.3% |
| 45 - 54 | 0.0% |
| 55 - 64 | 16.7% |
| 65 - 74 | 16.7% |
| 75 - 84 | 0.0% |
| 85 - 94 | 16.7% |
| 95 - 104 | 0.0% |
| 105 - 114 | 0.0% |
| 115 - 124 | 0.0% |
| 125 - 134 | 16.7% |
| 135 - 144 | 0.0% |
| 145 - 154 | 0.0% |
| 155 - 164 | 0.0% |
| 165 - 174 | 0.0% |
| 175 - 184 | 0.0% |
| 185 - 194 | 0.0% |
| >195 | 0.0% |
| (Cases) N= | 6 |
| mean | 71 |
| min size (mm) | 37 |
| max size (mm) | 126 |

*Megathura crenulata*

| | |
|---|---|
| <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 | 0.0% |
| 70 - 79 | 7.1% |
| 80 - 89 | 28.6% |
| 90 - 99 | 14.3% |
| 100 - 109 | 7.1% |
| 110 - 119 | 7.1% |
| > 119 | 35.7% |
| (Cases) N= | 14 |
| mean | 107 |
| min size (mm) | 79 |
| max size (mm) | 150 |

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 1.6% |
| 40 - 49 | 1.6% |
| 50 - 59 | 13.1% |
| 60 - 69 | 19.7% |
| 70 - 79 | 27.9% |
| 80 - 89 | 24.6% |
| 90 - 99 | 8.2% |
| > 99 | 3.3% |
| (Cases) N= | 61 |
| mean | 74 |
| mean | 74 |
| min size (mm) | 33 |
| max size (mm) | 103 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 8.5% |
| 60 - 79 | 40.8% |
| 80 - 99 | 25.4% |
| 100 - 119 | 21.1% |
| 120 - 139 | 1.4% |
| 140 - 159 | 0.0% |
| 160 - 179 | 1.4% |
| 180 - 199 | 1.4% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 71 |
| mean | 86 |
| min size (mm) | 45 |
| max size (mm) | 195 |

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 16.7% |
| 80 - 99 | 12.5% |
| 100 - 119 | 20.8% |
| 120 - 139 | 20.8% |
| 140 - 159 | 4.2% |
| 160 - 179 | 12.5% |
| 180 - 199 | 4.2% |
| 200 - 219 | 8.3% |
| 220 - 239 | 0.0% |
| 240 - 259 | 0.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| (Cases) N= | 24 |
| mean | 125 |
| min size (mm) | 69 |
| max size (mm) | 212 |

*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 | 0.9% |
| 35 - 39 | 0.5% |
| 40 - 44 | 0.9% |
| 45 - 49 | 50 - 540.5% |
| 45 - 49 | 0.5% |
| 50 - 54 | 4.1% |
| 55 - 59 | 1.8% |
| 60 - 64 | 4.1% |
| 65 - 69 | 10.0% |
| 70 - 74 | 8.6% |
| 75 - 79 | 14.9% |
| 80 - 84 | 15.4% |
| 85 - 89 | 19.9% |
| 90 - 94 | 11.3% |
| 95 - 99 | 5.9% |
| 100 - 104 | 1.4% |
| 105 - 109 | 0.0% |
| > 109 | 0.0% |
| (Cases) N= | 221 |
| mean | 79 |
| min size (mm) | 32 |
| max size (mm) | 104 |

## Santa Rosa Island - Johnson's Lee South

*Tethya aurantia*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **1.6%** |
| **30 - 39** | **3.2%** |
| **40 - 49** | **4.8%** |
| **50 - 59** | **9.7%** |
| **60 - 69** | **21.0%** |
| **70 - 79** | **24.2%** |
| **80 - 89** | **22.6%** |
| **90 - 99** | **6.5%** |
| **> 99** | **6.5%** |
| **(Cases) N=** | **62** |
| **mean** | **72** |
| **min size (mm)** | **24** |
| **max size (mm)** | **107** |

*Haliotis rufescens*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **100.0%** |
| **(Cases) N=** | **2** |
| **mean** | **228** |
| **min size (mm)** | **222** |
| **max size (mm)** | **234** |

*Kelletia kelletii*

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **16.7%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **33.3%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **33.3%** |
| **110 - 119** | **16.7%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **93** |
| **min size (mm)** | **62** |
| **max size (mm)** | **112** |

*Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **1.7%** |
| **30 - 39** | **8.3%** |
| **40 - 49** | **10.0%** |
| **50 - 59** | **30.0%** |
| **60 - 69** | **26.7%** |
| **70 - 79** | **23.3%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **60** |
| **mean** | **58** |
| **mean** | **58** |
| **min size (mm)** | **29** |
| **max size (mm)** | **78** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **70.6%** |
| **60 - 79** | **17.6%** |
| **80 - 99** | **5.9%** |
| **100 - 119** | **5.9%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **17** |
| **mean** | **59** |
| **min size (mm)** | **40** |
| **max size (mm)** | **115** |

*Pycnopodia helianthoides*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **1.7%** |
| **80 - 99** | **1.7%** |
| **100 - 119** | **10.2%** |
| **120 - 139** | **15.3%** |
| **140 - 159** | **25.4%** |
| **160 - 179** | **25.4%** |
| **180 - 199** | **5.1%** |
| **200 - 219** | **3.4%** |
| **220 - 239** | **6.8%** |
| **240 - 259** | **0.0%** |
| **260 - 279** | **3.4%** |
| **280 - 299** | **0.0%** |
| **> 299** | **1.7%** |
| **(Cases) N=** | **59** |
| **mean** | **161** |
| **min size (mm)** | **62** |
| **max size (mm)** | **370** |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **2.4%** |
| **25 - 29** | **3.9%** |
| **30 - 34** | **1.5%** |
| **35 - 39** | **5.8%** |
| **40 - 44** | **6.8%** |
| **45 - 49** | **50 - 543.4%** |
| **45 - 49** | **3.4%** |
| **50 - 54** | **3.4%** |
| **55 - 59** | **1.9%** |
| **60 - 64** | **6.3%** |
| **65 - 69** | **10.7%** |
| **70 - 74** | **8.3%** |
| **75 - 79** | **11.2%** |
| **80 - 84** | **10.2%** |
| **85 - 89** | **8.7%** |
| **90 - 94** | **11.2%** |
| **95 - 99** | **2.4%** |
| **100 - 104** | **1.5%** |
| **105 - 109** | **0.5%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **206** |
| **mean** | **68** |
| **min size (mm)** | **21** |
| **max size (mm)** | **106** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **15.4%** |
| **20 - 24** | **11.5%** |
| **25 - 29** | **38.5%** |
| **30 - 34** | **7.7%** |
| **35 - 39** | **7.7%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **11.5%** |
| **50 - 54** | **3.8%** |
| **55 - 59** | **0.0%** |
| **60 - 64** | **3.8%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **26** |
| **mean** | **30** |
| **min size (mm)** | **17** |
| **max size (mm)** | **63** |

# 2003 Natural Habitat Size Frequency Distributions

## Santa Rosa Island - Rodes Reef

*Tethya aurantia*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 2.3% |
| 40 - 49 | 11.6% |
| 50 - 59 | 7.0% |
| 60 - 69 | 27.9% |
| 70 - 79 | 16.3% |
| 80 - 89 | 20.9% |
| 90 - 99 | 9.3% |
| > 99 | 4.7% |
| (Cases) N= | 43 |
| mean | 71 |
| min size (mm) | 35 |
| max size (mm) | 110 |

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 1.3% |
| 20 - 29 | 11.8% |
| 30 - 39 | 32.9% |
| 40 - 49 | 15.8% |
| 50 - 59 | 21.1% |
| 60 - 69 | 10.5% |
| 70 - 79 | 5.3% |
| 80 - 89 | 1.3% |
| 90 - 99 | 0.0% |
| > 99 | 0.0% |
| (Cases) N= | 76 |
| mean | 44 |
| min size (mm) | 19 |
| max size (mm) | 80 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 2.9% |
| 40 - 59 | 52.9% |
| 60 - 79 | 32.4% |
| 80 - 99 | 7.4% |
| 100 - 119 | 2.9% |
| 120 - 139 | 0.0% |
| 140 - 159 | 0.0% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 1.5% |
| (Cases) N= | 68 |
| mean | 62 |
| min size (mm) | 38 |
| max size (mm) | 279 |

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 6.0% |
| 40 - 59 | 14.0% |
| 60 - 79 | 26.0% |
| 80 - 99 | 32.0% |
| 100 - 119 | 12.0% |
| 120 - 139 | 0.0% |
| 140 - 159 | 0.0% |
| 160 - 179 | 6.0% |
| 180 - 199 | 2.0% |
| 200 - 219 | 2.0% |
| 220 - 239 | 0.0% |
| 240 - 259 | 0.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| (Cases) N= | 50 |
| mean | 86 |
| min size (mm) | 27 |
| max size (mm) | 210 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 0.0% |
| 10 - 14 | 0.9% |
| 15 - 19 | 0.9% |
| 20 - 24 | 0.9% |
| 25 - 29 | 2.3% |
| 30 - 34 | 1.4% |
| 35 - 39 | 0.9% |
| 40 - 44 | 10.9% |
| 45 - 49 | 17.7% |
| 50 - 54 | 20.5% |
| 55 - 59 | 16.8% |
| 60 - 64 | 7.7% |
| 65 - 69 | 6.8% |
| 70 - 74 | 5.5% |
| 75 - 79 | 1.4% |
| 80 - 84 | 1.8% |
| 85 - 89 | 1.8% |
| 90 - 94 | 0.5% |
| 95 - 99 | 1.4% |
| 100 - 104 | 0.0% |
| 105 - 109 | 0.0% |
| > 109 | 0.0% |
| (Cases) N= | 220 |
| mean | 54 |
| min size (mm) | 12 |
| max size (mm) | 97 |

## Santa Cruz Island - Gull Island South

*Tethya aurantia*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **20.0%** |
| **40 - 49** | **40.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **40.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **61** |
| **min size (mm)** | **32** |
| **max size (mm)** | **95** |

*Lithopoma gibberosum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **100.0%** |
| **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** | **54** |
| **min size (mm)** | **54** |
| **max size (mm)** | **54** |

*Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **1.7%** |
| **40 - 49** | **13.3%** |
| **50 - 59** | **30.0%** |
| **60 - 69** | **25.0%** |
| **70 - 79** | **23.3%** |
| **80 - 89** | **5.0%** |
| **90 - 99** | **1.7%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **60** |
| **mean** | **63** |
| **min size (mm)** | **39** |
| **max size (mm)** | **92** |

*Kelletia kelletii*

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **33.3%** |
| **90 - 99** | **66.7%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **91** |
| **min size (mm)** | **88** |
| **max size (mm)** | **94** |

*Crassedoma giganteum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **16.7%** |
| **40 - 49** | **16.7%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **16.7%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **33.3%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **> 139** | **16.7%** |
| **(Cases) N=** | **6** |
| **mean** | **89** |
| **min size (mm)** | **37** |
| **max size (mm)** | **142** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **15.7%** |
| **80 - 99** | **15.7%** |
| **100 - 119** | **37.3%** |
| **120 - 139** | **19.6%** |
| **140 - 159** | **11.8%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **51** |
| **mean** | **109** |
| **min size (mm)** | **mean66** |
| **min size (mm)** | **66** |
| **max size (mm)** | **154** |

*Lithopoma undosum*

| | |
|---|---|
| **<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** | **0.0%** |
| **70 - 79** | **66.7%** |
| **80 - 89** | **33.3%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **79** |
| **min size (mm)** | **76** |
| **max size (mm)** | **83** |

# Santa Cruz Island - Gull Island South

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 0.0% |
| 80 - 99 | 0.0% |
| 100 - 119 | 27.8% |
| 120 - 139 | 55.6% |
| 140 - 159 | 11.1% |
| 160 - 179 | 5.6% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| 240 - 259 | 0.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| **(Cases) N=** | **18** |
| **mean** | **128** |
| **min size (mm)** | **100** |
| **max size (mm)** | **170** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 0.0% |
| 10 - 14 | 0.0% |
| 15 - 19 | 0.0% |
| 20 - 24 | 16.7% |
| 25 - 29 | 11.1% |
| 30 - 34 | 11.1% |
| 35 - 39 | 27.8% |
| 40 - 44 | 27.8% |
| 45 - 49 | 5.6% |
| 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=** | **18** |
| **mean** | **35** |
| **min size (mm)** | **22** |
| **max size (mm)** | **48** |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 0.0% |
| 10 - 14 | 0.0% |
| 15 - 19 | 2.9% |
| 20 - 24 | 8.6% |
| 25 - 29 | 2.9% |
| 30 - 34 | 2.9% |
| 35 - 39 | 2.9% |
| 40 - 44 | 0.0% |
| 45 - 49 | 0.0% |
| 50 - 54 | 11.4% |
| 55 - 59 | 0.0% |
| 60 - 64 | 8.6% |
| 65 - 69 | 5.7% |
| 70 - 74 | 14.3% |
| 75 - 79 | 11.4% |
| 80 - 84 | 11.4% |
| 85 - 89 | 8.6% |
| 90 - 94 | 5.7% |
| 95 - 99 | 0.0% |
| 100 - 104 | 2.9% |
| 105 - 109 | 0.0% |
| > 109 | 0.0% |
| **(Cases) N=** | **35** |
| **mean** | **64** |
| **min size (mm)** | **16** |
| **max size (mm)** | **104** |

## Santa Cruz Island - Fry's Harbor

*Kelletia kelletii*

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **100.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **85** |
| **min size (mm)** | **82** |
| **max size (mm)** | **88** |

*Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **6.5%** |
| **30 - 39** | **11.3%** |
| **40 - 49** | **11.3%** |
| **50 - 59** | **30.6%** |
| **60 - 69** | **19.4%** |
| **70 - 79** | **19.4%** |
| **80 - 89** | **1.6%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **62** |
| **mean** | **56** |
| **min size (mm)** | **27** |
| **max size (mm)** | **83** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **22.4%** |
| **60 - 79** | **39.7%** |
| **80 - 99** | **19.0%** |
| **100 - 119** | **8.6%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **8.6%** |
| **160 - 179** | **1.7%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **58** |
| **mean** | **80** |
| **min size (mm)** | **41** |
| **max size (mm)** | **177** |

*Pycnopodia helianthoides*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **9.4%** |
| **220 - 239** | **18.8%** |
| **240 - 259** | **23.4%** |
| **260 - 279** | **21.9%** |
| **280 - 299** | **14.1%** |
| **> 299** | **12.5%** |
| **(Cases) N=** | **64** |
| **mean** | **257** |
| **min size (mm)** | **200** |
| **max size (mm)** | **340** |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.9%** |
| **10 - 14** | **2.4%** |
| **15 - 19** | **3.8%** |
| **20 - 24** | **2.4%** |
| **25 - 29** | **3.3%** |
| **30 - 34** | **8.0%** |
| **35 - 39** | **9.9%** |
| **40 - 44** | **13.7%** |
| **45 - 49** | **17.5%** |
| **50 - 54** | **9.4%** |
| **55 - 59** | **6.1%** |
| **60 - 64** | **3.3%** |
| **65 - 69** | **5.2%** |
| **70 - 74** | **4.2%** |
| **75 - 79** | **0.9%** |
| **80 - 84** | **3.8%** |
| **85 - 89** | **1.9%** |
| **90 - 94** | **1.9%** |
| **95 - 99** | **1.4%** |
| **100 - 104** | **0.0%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **212** |
| **mean** | **48** |
| **min size (mm)** | **8** |
| **max size (mm)** | **98** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **1.3%** |
| **10 - 14** | **0.9%** |
| **15 - 19** | **9.6%** |
| **20 - 24** | **41.0%** |
| **25 - 29** | **32.8%** |
| **30 - 34** | **9.2%** |
| **35 - 39** | **1.3%** |
| **40 - 44** | **1.3%** |
| **45 - 49** | **1.3%** |
| **50 - 54** | **0.4%** |
| **55 - 59** | **0.9%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **229** |
| **mean** | **25** |
| **min size (mm)** | **6** |
| **max size (mm)** | **59** |

## Santa Cruz Island - Pelican Bay

### *Tethya aurantia*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **66.7%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **33.3%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **22** |
| **min size (mm)** | **12** |
| **max size (mm)** | **36** |

### *Kelletia kelletii*

| | |
|---|---|
| **< 40** | **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%** |
| **120 - 129** | **50.0%** |
| **130 - 139** | **33.3%** |
| **140 - 149** | **16.7%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **131** |
| **min size (mm)** | **122** |
| **max size (mm)** | **141** |

### *Lithopoma undosum*

| | |
|---|---|
| **<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** | **26.1%** |
| **70 - 79** | **39.1%** |
| **80 - 89** | **30.4%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **4.3%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **23** |
| **mean** | **75** |
| **min size (mm)** | **61** |
| **max size (mm)** | **108** |

### *Crassedoma giganteum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **22.2%** |
| **40 - 49** | **5.6%** |
| **50 - 59** | **5.6%** |
| **60 - 69** | **11.1%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **11.1%** |
| **90 - 99** | **11.1%** |
| **100 - 109** | **16.7%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **5.6%** |
| **130 - 139** | **0.0%** |
| **> 139** | **11.1%** |
| **(Cases) N=** | **18** |
| **mean** | **81** |
| **min size (mm)** | **31** |
| **max size (mm)** | **150** |

### *Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **1.5%** |
| **40 - 49** | **2.9%** |
| **50 - 59** | **17.6%** |
| **60 - 69** | **20.6%** |
| **70 - 79** | **20.6%** |
| **80 - 89** | **25.0%** |
| **90 - 99** | **11.8%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **68** |
| **mean** | **73** |
| **min size (mm)** | **37** |
| **max size (mm)** | **99** |

### *Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **10.3%** |
| **80 - 99** | **19.0%** |
| **100 - 119** | **31.0%** |
| **120 - 139** | **22.4%** |
| **140 - 159** | **8.6%** |
| **160 - 179** | **5.2%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **1.7%** |
| **220 - 239** | **1.7%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **58** |
| **mean** | **116** |
| **mean** | **116** |
| **min size (mm)** | **62** |
| **max size (mm)** | **229** |

### *Lytechinus anamesus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **14.1%** |
| **25 - 29** | **71.4%** |
| **30 - 34** | **14.1%** |
| **35 - 39** | **0.4%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.0%** |
| **> 49** | **0.0%** |
| **(Cases) N=** | **234** |
| **mean** | **27** |
| **min size (mm)** | **21** |
| **max size (mm)** | **35** |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.5%** |
| **15 - 19** | **0.5%** |
| **20 - 24** | **1.8%** |
| **25 - 29** | **4.1%** |
| **30 - 34** | **15.4%** |
| **35 - 39** | **23.1%** |
| **40 - 44** | **26.2%** |
| **45 - 49** | **14.5%** |
| **50 - 54** | **10.0%** |
| **55 - 59** | **2.3%** |
| **60 - 64** | **1.4%** |
| **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=** | **221** |
| **mean** | **40** |
| **min size (mm)** | **10** |
| **max size (mm)** | **65** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.4%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.4%** |
| **20 - 24** | **43.8%** |
| **25 - 29** | **45.5%** |
| **30 - 34** | **7.1%** |
| **35 - 39** | **2.2%** |
| **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=** | **224** |
| **mean** | **25** |
| **min size (mm)** | **5** |
| **max size (mm)** | **41** |

# 2003 Natural Habitat Size Frequency Distributions

## Santa Cruz Island - Scorpion Anchorage

*Tethya aurantia*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 12.5% |
| 30 - 39 | 31.3% |
| 40 - 49 | 18.8% |
| 50 - 59 | 12.5% |
| 60 - 69 | 25.0% |
| 70 - 79 | 0.0% |
| 80 - 89 | 0.0% |
| 90 - 99 | 0.0% |
| > 99 | 0.0% |
| (Cases) N= | 16 |
| mean | 43 |
| min size (mm) | 20 |
| max size (mm) | 67 |

*Megathura crenulata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 2.3% |
| 50 - 59 | 7.0% |
| 60 - 69 | 44.2% |
| 70 - 79 | 37.2% |
| 80 - 89 | 7.0% |
| 90 - 99 | 2.3% |
| 100 - 109 | 0.0% |
| 110 - 119 | 0.0% |
| > 119 | 0.0% |
| (Cases) N= | 43 |
| mean | 69 |
| min size (mm) | 40 |
| max size (mm) | 90 |

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 24.6% |
| 50 - 59 | 29.5% |
| 60 - 69 | 29.5% |
| 70 - 79 | 11.5% |
| 80 - 89 | 4.9% |
| 90 - 99 | 0.0% |
| > 99 | 0.0% |
| (Cases) N= | 61 |
| mean | 59 |
| min size (mm) | 41 |
| max size (mm) | 84 |

*Haliotis rufescens*

| | |
|---|---|
| <25 | 0.0% |
| 25 - 34 | 100.0% |
| 35 - 44 | 0.0% |
| 45 - 54 | 0.0% |
| 55 - 64 | 0.0% |
| 65 - 74 | 0.0% |
| 75 - 84 | 0.0% |
| 85 - 94 | 0.0% |
| 95 - 104 | 0.0% |
| 105 - 114 | 0.0% |
| 115 - 124 | 0.0% |
| 125 - 134 | 0.0% |
| 135 - 144 | 0.0% |
| 145 - 154 | 0.0% |
| 155 - 164 | 0.0% |
| 165 - 174 | 0.0% |
| 175 - 184 | 0.0% |
| 185 - 194 | 0.0% |
| >195 | 0.0% |
| (Cases) N= | 1 |
| mean | 29 |
| min size (mm) | 29 |
| max size (mm) | 29 |

*Crassedoma giganteum*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 6.3% |
| 50 - 59 | 3.1% |
| 60 - 69 | 6.3% |
| 70 - 79 | 9.4% |
| 80 - 89 | 12.5% |
| 90 - 99 | 21.9% |
| 100 - 109 | 12.5% |
| 110 - 119 | 3.1% |
| 120 - 129 | 9.4% |
| 130 - 139 | 3.1% |
| > 139 | 12.5% |
| (Cases) N= | 32 |
| mean | 100 |
| min size (mm) | 44 |
| max size (mm) | 182 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 18.5% |
| 80 - 99 | 55.6% |
| 100 - 119 | 22.2% |
| 120 - 139 | 0.0% |
| 140 - 159 | 3.7% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 27 |
| mean | 95 |
| mean | 95 |
| min size (mm) | 64 |
| max size (mm) | 140 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **0.4%** |
| **25 - 29** | **0.4%** |
| **30 - 34** | **2.1%** |
| **35 - 39** | **10.3%** |
| **40 - 44** | **21.4%** |
| **45 - 49** | **26.7%** |
| **50 - 54** | **18.1%** |
| **55 - 59** | **12.3%** |
| **60 - 64** | **5.3%** |
| **65 - 69** | **1.6%** |
| **70 - 74** | **0.8%** |
| **75 - 79** | **0.4%** |
| **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=** | **243** |
| **mean** | **48** |
| **min size (mm)** | **23** |
| **max size (mm)** | **77** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **1.2%** |
| **20 - 24** | **34.6%** |
| **25 - 29** | **47.6%** |
| **30 - 34** | **13.0%** |
| **35 - 39** | **3.3%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.3%** |
| **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=** | **332** |
| **mean** | **26** |
| **min size (mm)** | **18** |
| **max size (mm)** | **49** |

# Santa Cruz Island - Yellow Banks

*Tethya aurantia*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 66.7% |
| 50 - 59 | 33.3% |
| 60 - 69 | 0.0% |
| 70 - 79 | 0.0% |
| 80 - 89 | 0.0% |
| 90 - 99 | 0.0% |
| > 99 | 0.0% |
| (Cases) N= | 3 |
| mean | 49 |
| min size (mm) | 46 |
| max size (mm) | 52 |

*Lithopoma gibberosum*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 16.7% |
| 40 - 49 | 50.0% |
| 50 - 59 | 33.3% |
| 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= | 12 |
| mean | 46 |
| min size (mm) | 34 |
| max size (mm) | 52 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 13.0% |
| 60 - 79 | 8.7% |
| 80 - 99 | 26.1% |
| 100 - 119 | 8.7% |
| 120 - 139 | 21.7% |
| 140 - 159 | 8.7% |
| 160 - 179 | 4.3% |
| 180 - 199 | 4.3% |
| 200 - 219 | 0.0% |
| 220 - 239 | 4.3% |
| > 239 | 0.0% |
| (Cases) N= | 23 |
| mean | 112 |
| min size (mm) | 46 |
| max size (mm) | 239 |

*Kelletia kelletii*

| | |
|---|---|
| < 40 | 0.0% |
| 40 - 49 | 0.0% |
| 50 - 59 | 0.0% |
| 60 - 69 | 0.0% |
| 70 - 79 | 10.0% |
| 80 - 89 | 20.0% |
| 90 - 99 | 50.0% |
| 100 - 109 | 20.0% |
| 110 - 119 | 0.0% |
| 120 - 129 | 0.0% |
| 130 - 139 | 0.0% |
| 140 - 149 | 0.0% |
| > 149 | 0.0% |
| (Cases) N= | 10 |
| mean | 92 |
| min size (mm) | 75 |
| max size (mm) | 107 |

*Megathura crenulata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 0.0% |
| 50 - 59 | 7.7% |
| 60 - 69 | 38.5% |
| 70 - 79 | 15.4% |
| 80 - 89 | 15.4% |
| 90 - 99 | 23.1% |
| 100 - 109 | 0.0% |
| 110 - 119 | 0.0% |
| > 119 | 0.0% |
| (Cases) N= | 13 |
| mean | 76 |
| min size (mm) | 54 |
| max size (mm) | 94 |

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 0.0% |
| 80 - 99 | 0.0% |
| 100 - 119 | 4.0% |
| 120 - 139 | 0.0% |
| 140 - 159 | 0.0% |
| 160 - 179 | 0.0% |
| 180 - 199 | 8.0% |
| 200 - 219 | 12.0% |
| 220 - 239 | 20.0% |
| 240 - 259 | 24.0% |
| 260 - 279 | 16.0% |
| 280 - 299 | 16.0% |
| > 299 | 0.0% |
| (Cases) N= | 25 |
| mean | 235 |
| min size (mm) | 100 |
| max size (mm) | 290 |

*Lithopoma undosum*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 1.6% |
| 30 - 39 | 0.0% |
| 40 - 49 | 1.6% |
| 50 - 59 | 3.3% |
| 60 - 69 | 23.0% |
| 70 - 79 | 45.9% |
| 80 - 89 | 11.5% |
| 90 - 99 | 3.3% |
| 100 - 109 | 6.6% |
| 110 - 119 | 1.6% |
| > 119 | 1.6% |
| (Cases) N= | 61 |
| mean | 76 |
| min size (mm) | 24 |
| max size (mm) | 126 |

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 7.5% |
| 30 - 39 | 6.5% |
| 40 - 49 | 12.9% |
| 50 - 59 | 14.0% |
| 60 - 69 | 28.0% |
| 70 - 79 | 21.5% |
| 80 - 89 | 7.5% |
| 90 - 99 | 2.2% |
| > 99 | 0.0% |
| (Cases) N= | 93 |
| mean | 60 |
| min size (mm) | 24 |
| max size (mm) | 95 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **2.9%** |
| **10 - 14** | **17.3%** |
| **15 - 19** | **8.1%** |
| **20 - 24** | **0.6%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **1.2%** |
| **35 - 39** | **2.3%** |
| **40 - 44** | **0.6%** |
| **45 - 49** | **0.6%** |
| **50 - 54** | **1.7%** |
| **55 - 59** | **2.3%** |
| **60 - 64** | **2.3%** |
| **65 - 69** | **2.3%** |
| **70 - 74** | **4.0%** |
| **75 - 79** | **5.8%** |
| **80 - 84** | **6.4%** |
| **85 - 89** | **7.5%** |
| **90 - 94** | **12.7%** |
| **95 - 99** | **7.5%** |
| **100 - 104** | **7.5%** |
| **105 - 109** | **2.9%** |
| **> 109** | **3.5%** |
| **(Cases) N=** | **173** |
| **mean** | **63** |
| **min size (mm)** | **7** |
| **max size (mm)** | **117** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **1.6%** |
| **10 - 14** | **9.4%** |
| **15 - 19** | **26.6%** |
| **20 - 24** | **32.8%** |
| **25 - 29** | **12.5%** |
| **30 - 34** | **14.1%** |
| **35 - 39** | **3.1%** |
| **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=** | **64** |
| **mean** | **22** |
| **min size (mm)** | **5** |
| **max size (mm)** | **37** |

# Anacapa Island - Admiral's Reef

*Kelletia kelletii*

| | |
|---|---|
| < 40 | 0.0% |
| 40 - 49 | 0.0% |
| 50 - 59 | 0.0% |
| 60 - 69 | 0.0% |
| 70 - 79 | 0.0% |
| 80 - 89 | 10.0% |
| 90 - 99 | 40.0% |
| 100 - 109 | 0.0% |
| 110 - 119 | 30.0% |
| 120 - 129 | 20.0% |
| 130 - 139 | 0.0% |
| 140 - 149 | 0.0% |
| > 149 | 0.0% |
| (Cases) N= | 10 |
| mean | 107 |
| min size (mm) | 89 |
| max size (mm) | 124 |

*Lithopoma undosum*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 0.0% |
| 50 - 59 | 13.8% |
| 60 - 69 | 27.6% |
| 70 - 79 | 34.5% |
| 80 - 89 | 20.7% |
| 90 - 99 | 3.4% |
| 100 - 109 | 0.0% |
| 110 - 119 | 0.0% |
| > 119 | 0.0% |
| (Cases) N= | 29 |
| mean | 72 |
| min size (mm) | 53 |
| max size (mm) | 90 |

*Megathura crenulata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 3.7% |
| 50 - 59 | 18.5% |
| 60 - 69 | 51.9% |
| 70 - 79 | 22.2% |
| 80 - 89 | 3.7% |
| 90 - 99 | 0.0% |
| 100 - 109 | 0.0% |
| 110 - 119 | 0.0% |
| > 119 | 0.0% |
| (Cases) N= | 27 |
| mean | 65 |
| min size (mm) | 48 |
| max size (mm) | 86 |

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 1.3% |
| 40 - 49 | 12.0% |
| 50 - 59 | 24.0% |
| 60 - 69 | 22.7% |
| 70 - 79 | 22.7% |
| 80 - 89 | 9.3% |
| 90 - 99 | 5.3% |
| > 99 | 2.7% |
| (Cases) N= | 75 |
| mean | 66 |
| min size (mm) | 30 |
| max size (mm) | 101 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 0.0% |
| 80 - 99 | 0.0% |
| 100 - 119 | 10.0% |
| 120 - 139 | 0.0% |
| 140 - 159 | 40.0% |
| 160 - 179 | 40.0% |
| 180 - 199 | 10.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 10 |
| mean | 157 |
| min size (mm) | 114 |
| max size (mm) | 182 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 1.1% |
| 10 - 14 | 1.1% |
| 15 - 19 | 0.0% |
| 20 - 24 | 4.9% |
| 25 - 29 | 24.5% |
| 30 - 34 | 40.8% |
| 35 - 39 | 19.6% |
| 40 - 44 | 5.3% |
| 45 - 49 | 1.1% |
| 50 - 54 | 0.8% |
| 55 - 59 | 0.4% |
| 60 - 64 | 0.4% |
| 65 - 69 | 0.0% |
| 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= | 265 |
| mean | 32 |
| min size (mm) | 8 |
| max size (mm) | 63 |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 9 | 2.1% |
| 10 - 14 | 15 - 192.1% |
| 15 - 19 | 5.5% |
| 20 - 24 | 54.0% |
| 25 - 29 | 33.7% |
| 30 - 34 | 2.7% |
| 35 - 39 | 0.0% |
| 35 - 39 | 0.0% |
| 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= | 291 |
| mean | 23 |
| min size (mm) | 8 |
| max size (mm) | 33 |

# Anacapa Island - Cathedral Cove

*Lithopoma undosum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **8.1%** |
| **30 - 39** | **26.3%** |
| **40 - 49** | **21.2%** |
| **50 - 59** | **8.1%** |
| **60 - 69** | **14.1%** |
| **70 - 79** | **14.1%** |
| **80 - 89** | **6.1%** |
| **90 - 99** | **2.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **99** |
| **mean** | **51** |
| **min size (mm)** | **21** |
| **max size (mm)** | **95** |

*Crassedoma giganteum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **2.0%** |
| **40 - 49** | **9.8%** |
| **50 - 59** | **17.6%** |
| **60 - 69** | **25.5%** |
| **70 - 79** | **21.6%** |
| **80 - 89** | **7.8%** |
| **90 - 99** | **7.8%** |
| **100 - 109** | **3.9%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **3.9%** |
| **130 - 139** | **0.0%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **51** |
| **mean** | **69** |
| **min size (mm)** | **33** |
| **max size (mm)** | **121** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **20.0%** |
| **80 - 99** | **40.0%** |
| **100 - 119** | **20.0%** |
| **120 - 139** | **20.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **95** |
| **min size (mm)** | **74** |
| **max size (mm)** | **122** |

*Megathura crenulata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **25.0%** |
| **50 - 59** | **50.0%** |
| **60 - 69** | **25.0%** |
| **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=** | **4** |
| **mean** | **54** |
| **min size (mm)** | **43** |
| **max size (mm)** | **60** |

*Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **1.4%** |
| **20 - 29** | **13.0%** |
| **30 - 39** | **27.5%** |
| **40 - 49** | **31.9%** |
| **50 - 59** | **17.4%** |
| **60 - 69** | **8.7%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **69** |
| **mean** | **42** |
| **min size (mm)** | **17** |
| **max size (mm)** | **64** |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.3%** |
| **5 - 9** | **4.1%** |
| **10 - 14** | **1.0%** |
| **15 - 19** | **0.7%** |
| **20 - 24** | **0.3%** |
| **25 - 29** | **1.0%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **40 - 44** | **0.3%** |
| **45 - 49** | **1.4%** |
| **50 - 54** | **1.4%** |
| **55 - 59** | **4.1%** |
| **60 - 64** | **6.1%** |
| **65 - 69** | **1.7%** |
| **70 - 74** | **8.1%** |
| **75 - 79** | **6.8%** |
| **80 - 84** | **10.1%** |
| **85 - 89** | **8.1%** |
| **90 - 94** | **12.5%** |
| **95 - 99** | **13.9%** |
| **100 - 104** | **9.5%** |
| **105 - 109** | **2.7%** |
| **> 109** | **6.1%** |
| **(Cases) N=** | **296** |
| **mean** | **81** |
| **min size (mm)** | **4** |
| **max size (mm)** | **129** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **1.2%** |
| **5 - 9** | **2.4%** |
| **10 - 14** | **0.6%** |
| **15 - 19** | **0.6%** |
| **20 - 24** | **0.6%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **2.4%** |
| **35 - 39** | **7.7%** |
| **40 - 44** | **18.3%** |
| **45 - 49** | **19.5%** |
| **50 - 54** | **17.8%** |
| **55 - 59** | **14.2%** |
| **60 - 64** | **9.5%** |
| **65 - 69** | **3.0%** |
| **70 - 74** | **2.4%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **169** |
| **mean** | **48** |
| **min size (mm)** | **3** |
| **max size (mm)** | **72** |

## Anacapa Island - Landing Cove

### *Haliotis corrugata*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **100.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **157** |
| **min size (mm)** | **157** |
| **max size (mm)** | **157** |

### *Lithopoma undosum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **5.6%** |
| **40 - 49** | **25.0%** |
| **50 - 59** | **29.2%** |
| **60 - 69** | **19.4%** |
| **70 - 79** | **13.9%** |
| **80 - 89** | **2.8%** |
| **90 - 99** | **2.8%** |
| **100 - 109** | **1.4%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **72** |
| **mean** | **58** |
| **min size (mm)** | **31** |
| **max size (mm)** | **103** |

### *Megathura crenulata*

| | |
|---|---|
| **<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** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **100.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **87** |
| **mean** | **87** |
| **min size (mm)** | **87** |
| **max size (mm)** | **87** |

### *Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **60.0%** |
| **100 - 119** | **20.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **20.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **117** |
| **mean** | **117** |
| **min size (mm)** | **88** |
| **max size (mm)** | **196** |

### *Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **3.5%** |
| **10 - 14** | **5.8%** |
| **15 - 19** | **1.2%** |
| **20 - 24** | **2.3%** |
| **25 - 29** | **1.2%** |
| **30 - 34** | **0.6%** |
| **35 - 39** | **0.6%** |
| **40 - 44** | **0.6%** |
| **45 - 49** | **2.3%** |
| **50 - 54** | **1.8%** |
| **55 - 59** | **2.3%** |
| **60 - 64** | **0.6%** |
| **65 - 69** | **0.6%** |
| **70 - 74** | **75 - 792.3%** |
| **70 - 74** | **2.3%** |
| **75 - 79** | **3.5%** |
| **80 - 84** | **9.9%** |
| **85 - 89** | **7.6%** |
| **90 - 94** | **15.8%** |
| **95 - 99** | **10.5%** |
| **100 - 104** | **9.4%** |
| **105 - 109** | **8.8%** |
| **> 109** | **8.8%** |
| **(Cases) N=** | **171** |
| **mean** | **80** |
| **min size (mm)** | **7** |
| **max size (mm)** | **123** |

### *Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **8.1%** |
| **10 - 14** | **7.4%** |
| **15 - 19** | **2.7%** |
| **20 - 24** | **25 - 295.4%** |
| **20 - 24** | **5.4%** |
| **25 - 29** | **8.8%** |
| **30 - 34** | **8.1%** |
| **35 - 39** | **11.5%** |
| **40 - 44** | **15.5%** |
| **45 - 49** | **10.8%** |
| **50 - 54** | **12.8%** |
| **55 - 59** | **6.1%** |
| **60 - 64** | **2.7%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **148** |
| **mean** | **36** |
| **min size (mm)** | **5** |
| **max size (mm)** | **64** |

## Santa Barbara Island - SE Sea Lion Rookery

*Tethya aurantia*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 4.2% |
| 30 - 39 | 8.3% |
| 40 - 49 | 8.3% |
| 50 - 59 | 33.3% |
| 60 - 69 | 20.8% |
| 70 - 79 | 12.5% |
| 80 - 89 | 4.2% |
| 90 - 99 | 8.3% |
| > 99 | 0.0% |
| (Cases) N= | 24 |
| mean | 60 |
| min size (mm) | 24 |
| max size (mm) | 92 |

*Lithopoma undosum*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 5.0% |
| 20 - 29 | 17.5% |
| 30 - 39 | 17.5% |
| 40 - 49 | 49.2% |
| 50 - 59 | 5.8% |
| 60 - 69 | 3.3% |
| 70 - 79 | 1.7% |
| 80 - 89 | 0.0% |
| 90 - 99 | 0.0% |
| 100 - 109 | 0.0% |
| 110 - 119 | 0.0% |
| > 119 | 0.0% |
| (Cases) N= | 120 |
| mean | 39 |
| min size (mm) | 15 |
| max size (mm) | 72 |

*Megathura crenulata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 0.0% |
| 40 - 49 | 0.0% |
| 50 - 59 | 20.0% |
| 60 - 69 | 10.0% |
| 70 - 79 | 10.0% |
| 80 - 89 | 10.0% |
| 90 - 99 | 20.0% |
| 100 - 109 | 30.0% |
| 110 - 119 | 0.0% |
| > 119 | 0.0% |
| (Cases) N= | 10 |
| mean | 83 |
| min size (mm) | 51 |
| max size (mm) | 108 |

*Crassedoma giganteum*

| | |
|---|---|
| <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 | 0.0% |
| 70 - 79 | 0.0% |
| 80 - 89 | 0.0% |
| 90 - 99 | 0.0% |
| 100 - 109 | 0.0% |
| 110 - 119 | 100.0% |
| 120 - 129 | 0.0% |
| 130 - 139 | 0.0% |
| > 139 | 0.0% |
| (Cases) N= | 1 |
| mean | 110 |
| min size (mm) | 110 |
| max size (mm) | 110 |

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 0.0% |
| 20 - 29 | 0.0% |
| 30 - 39 | 6.5% |
| 40 - 49 | 8.6% |
| 50 - 59 | 19.4% |
| 60 - 69 | 28.0% |
| 70 - 79 | 30.1% |
| 80 - 89 | 5.4% |
| 90 - 99 | 2.2% |
| > 99 | 0.0% |
| (Cases) N= | 93 |
| mean | 64 |
| min size (mm) | 32 |
| max size (mm) | 93 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 0.0% |
| 80 - 99 | 3.8% |
| 100 - 119 | 42.3% |
| 120 - 139 | 42.3% |
| 140 - 159 | 11.5% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 26 |
| mean | 120 |
| mean | 120 |
| min size (mm) | 98 |
| max size (mm) | 159 |

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 0.0% |
| 80 - 99 | 0.0% |
| 100 - 119 | 0.0% |
| 120 - 139 | 0.0% |
| 140 - 159 | 50.0% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| 240 - 259 | 50.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| (Cases) N= | 4 |
| mean | 196 |
| min size (mm) | 146 |
| max size (mm) | 250 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **13.5%** |
| **10 - 14** | **4.3%** |
| **15 - 19** | **0.5%** |
| **20 - 24** | **3.2%** |
| **25 - 29** | **13.0%** |
| **30 - 34** | **11.4%** |
| **35 - 39** | **8.6%** |
| **40 - 44** | **6.5%** |
| **45 - 49** | **8.1%** |
| **50 - 54** | **7.6%** |
| **55 - 59** | **11.9%** |
| **60 - 64** | **5.4%** |
| **65 - 69** | **3.8%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **80 - 84** | **0.0%** |
| **85 - 89** | **0.0%** |
| **90 - 94** | **0.5%** |
| **95 - 99** | **0.0%** |
| **100 - 104** | **1.6%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **185** |
| **mean** | **38** |
| **min size (mm)** | **5** |
| **max size (mm)** | **104** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **1.3%** |
| **5 - 9** | **19.5%** |
| **10 - 14** | **23.5%** |
| **15 - 19** | **44.3%** |
| **20 - 24** | **8.7%** |
| **25 - 29** | **2.0%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.7%** |
| **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=** | **149** |
| **mean** | **15** |
| **min size (mm)** | **4** |
| **max size (mm)** | **38** |

## Santa Barbara Island - Arch Point

*Asterina miniata*

| | |
|---|---|
| <10 | 0.0% |
| 10 - 19 | 1.3% |
| 20 - 29 | 12.8% |
| 30 - 39 | 24.4% |
| 40 - 49 | 34.6% |
| 50 - 59 | 12.8% |
| 60 - 69 | 7.7% |
| 70 - 79 | 2.6% |
| 80 - 89 | 1.3% |
| 90 - 99 | 1.3% |
| > 99 | 1.3% |
| (Cases) N= | 78 |
| mean | 45 |
| min size (mm) | 18 |
| max size (mm) | 103 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 1.6% |
| 60 - 79 | 14.5% |
| 80 - 99 | 16.1% |
| 100 - 119 | 43.5% |
| 120 - 139 | 17.7% |
| 140 - 159 | 4.8% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 1.6% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 62 |
| mean | 105 |
| min size (mm) | 49 |
| max size (mm) | 211 |

*Pycnopodia helianthoides*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 0.0% |
| 80 - 99 | 0.0% |
| 100 - 119 | 0.0% |
| 120 - 139 | 0.0% |
| 140 - 159 | 100.0% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| 240 - 259 | 0.0% |
| 260 - 279 | 0.0% |
| 280 - 299 | 0.0% |
| > 299 | 0.0% |
| (Cases) N= | 1 |
| mean | 156 |
| min size (mm) | 156 |
| max size (mm) | 156 |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| < 5 | 0.3% |
| 5 - 9 | 23.7% |
| 10 - 14 | 38.7% |
| 15 - 19 | 3.3% |
| 20 - 24 | 2.5% |
| 25 - 29 | 0.8% |
| 30 - 34 | 0.8% |
| 35 - 39 | 2.5% |
| 40 - 44 | 3.6% |
| 45 - 49 | 5.6% |
| 50 - 54 | 5.3% |
| 55 - 59 | 3.1% |
| 60 - 64 | 1.4% |
| 65 - 69 | 2.8% |
| 70 - 74 | 2.5% |
| 75 - 79 | 1.4% |
| 80 - 84 | 0.8% |
| 85 - 89 | 0.6% |
| 90 - 94 | 0.0% |
| 95 - 99 | 0.3% |
| 100 - 104 | 0.0% |
| 105 - 109 | 0.0% |
| > 109 | 0.0% |
| (Cases) N= | 359 |
| mean | 24 |
| min size (mm) | 4 |
| max size (mm) | 97 |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| < 5 | 0.9% |
| 5 - 9 | 11.6% |
| 10 - 14 | 7.1% |
| 15 - 19 | 15.2% |
| 20 - 24 | 43.8% |
| 25 - 29 | 14.3% |
| 30 - 34 | 3.6% |
| 35 - 39 | 2.7% |
| 40 - 44 | 0.0% |
| 45 - 49 | 0.0% |
| 50 - 54 | 0.9% |
| 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= | 112 |
| mean | 20 |
| min size (mm) | 4 |
| max size (mm) | 52 |

## Santa Barbara Island - Cat Canyon

*Lithopoma undosum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **7.1%** |
| **30 - 39** | **9.5%** |
| **40 - 49** | **21.4%** |
| **50 - 59** | **21.4%** |
| **60 - 69** | **4.8%** |
| **70 - 79** | **7.1%** |
| **80 - 89** | **14.3%** |
| **90 - 99** | **11.9%** |
| **100 - 109** | **2.4%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **42** |
| **mean** | **60** |
| **min size (mm)** | **24** |
| **max size (mm)** | **102** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **12.5%** |
| **80 - 99** | **58.3%** |
| **100 - 119** | **25.0%** |
| **120 - 139** | **4.2%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **24** |
| **mean** | **96** |
| **min size (mm)** | **67** |
| **max size (mm)** | **128** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **26.7%** |
| **5 - 9** | **53.3%** |
| **10 - 14** | **10.0%** |
| **15 - 19** | **3.3%** |
| **20 - 24** | **0.0%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **3.3%** |
| **35 - 39** | **3.3%** |
| **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=** | **30** |
| **mean** | **8** |
| **min size (mm)** | **3** |
| **max size (mm)** | **36** |

*Megathura crenulata*

| | |
|---|---|
| **<10** | |
| **10 - 19** | |
| **20 - 29** | |
| **30 - 39** | |
| **40 - 49** | |
| **50 - 59** | |
| **60 - 69** | |
| **70 - 79** | |
| **80 - 89** | |
| **90 - 99** | |
| **100 - 109** | |
| **110 - 119** | |
| **> 119** | |
| **(Cases) N=** | |
| **mean** | |
| **min size (mm)** | **9** |
| **max size (mm)** | **9** |

*Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **1.4%** |
| **5 - 9** | **21.6%** |
| **10 - 14** | **44.3%** |
| **15 - 19** | **3.1%** |
| **20 - 24** | **0.0%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **40 - 44** | **0.7%** |
| **45 - 49** | **0.3%** |
| **50 - 54** | **5.8%** |
| **55 - 59** | **3.8%** |
| **60 - 64** | **5.8%** |
| **65 - 69** | **5.2%** |
| **70 - 74** | **3.4%** |
| **75 - 79** | **3.1%** |
| **80 - 84** | **1.0%** |
| **85 - 89** | **0.3%** |
| **90 - 94** | **0.0%** |
| **95 - 99** | **0.0%** |
| **100 - 104** | **0.0%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **291** |
| **mean** | **26** |
| **min size (mm)** | **3** |
| **max size (mm)** | **85** |

*Asterina miniata*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **30.0%** |
| **40 - 49** | **40.0%** |
| **50 - 59** | **10.0%** |
| **60 - 69** | **10.0%** |
| **70 - 79** | **10.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **10** |
| **mean** | **46** |
| **min size (mm)** | **31** |
| **max size (mm)** | **72** |

## San Clemente Island - Northwest Harbor

### *Haliotis corrugata*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **33.3%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **33.3%** |
| **175 - 184** | **33.3%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **152** |
| **min size (mm)** | **110** |
| **max size (mm)** | **176** |

### *Kelletia kelletii*

| | |
|---|---|
| **< 40** | **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** | **12.5%** |
| **120 - 129** | **37.5%** |
| **130 - 139** | **50.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **8** |
| **mean** | **128** |
| **min size (mm)** | **119** |
| **max size (mm)** | **136** |

### *Lithopoma undosum*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **10.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **20.0%** |
| **80 - 89** | **20.0%** |
| **90 - 99** | **30.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **20.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **10** |
| **mean** | **85** |
| **mean** | **85** |
| **min size (mm)** | **39** |
| **max size (mm)** | **110** |

### *Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **7.1%** |
| **80 - 99** | **39.3%** |
| **100 - 119** | **42.9%** |
| **120 - 139** | **10.7%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **28** |
| **mean** | **100** |
| **mean** | **100** |
| **min size (mm)** | **69** |
| **max size (mm)** | **138** |

### *Strongylocentrotus franciscanus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **0.0%** |
| **25 - 29** | **0.6%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.0%** |
| **50 - 54** | **1.1%** |
| **55 - 59** | **0.0%** |
| **60 - 64** | **1.7%** |
| **65 - 69** | **7.2%** |
| **70 - 74** | **75 - 798.8%** |
| **70 - 74** | **8.8%** |
| **75 - 79** | **12.2%** |
| **80 - 84** | **14.9%** |
| **85 - 89** | **14.4%** |
| **90 - 94** | **14.9%** |
| **95 - 99** | **11.0%** |
| **100 - 104** | **6.6%** |
| **105 - 109** | **5.5%** |
| **> 109** | **1.1%** |
| **(Cases) N=** | **181** |
| **mean** | **86** |
| **min size (mm)** | **25** |
| **max size (mm)** | **130** |

### *Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **25 - 292.0%** |
| **20 - 24** | **2.0%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **3.9%** |
| **35 - 39** | **17.6%** |
| **40 - 44** | **21.6%** |
| **45 - 49** | **11.8%** |
| **50 - 54** | **11.8%** |
| **55 - 59** | **13.7%** |
| **60 - 64** | **5.9%** |
| **65 - 69** | **5.9%** |
| **70 - 74** | **5.9%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **51** |
| **mean** | **49** |
| **min size (mm)** | **22** |
| **max size (mm)** | **72** |

# San Clemente Island - Boy Scout Camp

*Haliotis corrugata*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **66.7%** |
| **165 - 174** | **33.3%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **164** |
| **min size (mm)** | **160** |
| **max size (mm)** | **170** |

*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** | **1.4%** |
| **45 - 49** | **0.0%** |
| **50 - 54** | **1.4%** |
| **55 - 59** | **1.4%** |
| **60 - 64** | **2.7%** |
| **65 - 69** | **1.4%** |
| **70 - 74** | **2.7%** |
| **75 - 79** | **1.4%** |
| **80 - 84** | **4.1%** |
| **85 - 89** | **10.8%** |
| **90 - 94** | **8.1%** |
| **95 - 99** | **10.8%** |
| **100 - 104** | **10.8%** |
| **105 - 109** | **9.5%** |
| **> 109** | **33.8%** |
| **(Cases) N=** | **74** |
| **mean** | **99** |
| **min size (mm)** | **43** |
| **max size (mm)** | **133** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 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** | **50.0%** |
| **50 - 54** | **0.0%** |
| **55 - 59** | **0.0%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **50.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **60** |
| **min size (mm)** | **48** |
| **max size (mm)** | **72** |

*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** | **2.9%** |
| **40 - 44** | **17.6%** |
| **45 - 49** | **8.8%** |
| **50 - 54** | **8.8%** |
| **55 - 59** | **0.0%** |
| **60 - 64** | **17.6%** |
| **65 - 69** | **8.8%** |
| **70 - 74** | **8.8%** |
| **75 - 79** | **5.9%** |
| **> 79** | **20.6%** |
| **(Cases) N=** | **34** |
| **mean** | **64** |
| **mean** | **64** |
| **min size (mm)** | **38** |
| **max size (mm)** | **116** |

## San Clemente Island - Eel Point

*Haliotis corrugata*

| | |
|---|---|
| <25 | 0.0% |
| 25 - 34 | 0.0% |
| 35 - 44 | 0.0% |
| 45 - 54 | 0.0% |
| 55 - 64 | 0.0% |
| 65 - 74 | 0.0% |
| 75 - 84 | 20.0% |
| 85 - 94 | 0.0% |
| 95 - 104 | 0.0% |
| 105 - 114 | 0.0% |
| 115 - 124 | 40.0% |
| 125 - 134 | 20.0% |
| 135 - 144 | 20.0% |
| 145 - 154 | 0.0% |
| 155 - 164 | 0.0% |
| 165 - 174 | 0.0% |
| 175 - 184 | 0.0% |
| 185 - 194 | 0.0% |
| >195 | 0.0% |
| (Cases) N= | 5 |
| mean | 118 |
| min size (mm) | 76 |
| max size (mm) | 138 |

*Kelletia kelletii*

| | |
|---|---|
| < 40 | 0.0% |
| 40 - 49 | 0.0% |
| 50 - 59 | 0.0% |
| 60 - 69 | 0.0% |
| 70 - 79 | 0.0% |
| 80 - 89 | 1.0% |
| 90 - 99 | 7.0% |
| 100 - 109 | 48.0% |
| 110 - 119 | 35.0% |
| 120 - 129 | 9.0% |
| 130 - 139 | 0.0% |
| 140 - 149 | 0.0% |
| > 149 | 0.0% |
| (Cases) N= | 100 |
| mean | 109 |
| min size (mm) | 82 |
| max size (mm) | 129 |

*Lithopoma undosum*

| | |
|---|---|
| <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 | 3.8% |
| 70 - 79 | 15.1% |
| 80 - 89 | 45.3% |
| 90 - 99 | 18.9% |
| 100 - 109 | 13.2% |
| 110 - 119 | 0.0% |
| > 119 | 3.8% |
| (Cases) N= | 53 |
| mean | 89 |
| mean | 89 |
| min size (mm) | 64 |
| max size (mm) | 125 |

*Megathura crenulata*

| | |
|---|---|
| <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 | 0.0% |
| 70 - 79 | 0.0% |
| 80 - 89 | 7.1% |
| 90 - 99 | 50.0% |
| 100 - 109 | 28.6% |
| 110 - 119 | 7.1% |
| > 119 | 7.1% |
| (Cases) N= | 14 |
| mean | 99 |
| mean | 99 |
| min size (mm) | 83 |
| max size (mm) | 123 |

*Pisaster giganteus*

| | |
|---|---|
| < 20 | 0.0% |
| 20 - 39 | 0.0% |
| 40 - 59 | 0.0% |
| 60 - 79 | 11.1% |
| 80 - 99 | 59.3% |
| 100 - 119 | 25.9% |
| 120 - 139 | 3.7% |
| 140 - 159 | 0.0% |
| 160 - 179 | 0.0% |
| 180 - 199 | 0.0% |
| 200 - 219 | 0.0% |
| 220 - 239 | 0.0% |
| > 239 | 0.0% |
| (Cases) N= | 27 |
| mean | 92 |
| mean | 92 |
| min size (mm) | 76 |
| max size (mm) | 123 |

*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 | 0.0% |
| 45 - 49 | 0.0% |
| 50 - 54 | 0.0% |
| 55 - 59 | 0.7% |
| 60 - 64 | 2.5% |
| 65 - 69 | 4.7% |
| 70 - 74 | 75 - 798.6% |
| 70 - 74 | 8.6% |
| 75 - 79 | 10.4% |
| 80 - 84 | 13.3% |
| 85 - 89 | 15.5% |
| 90 - 94 | 15.1% |
| 95 - 99 | 10.8% |
| 100 - 104 | 7.9% |
| 105 - 109 | 3.2% |
| > 109 | 7.2% |
| (Cases) N= | 278 |
| mean | 88 |
| min size (mm) | 55 |
| max size (mm) | 132 |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.6%** |
| **20 - 24** | **2.5%** |
| **25 - 29** | **7.5%** |
| **30 - 34** | **11.3%** |
| **35 - 39** | **16.3%** |
| **40 - 44** | **20.6%** |
| **45 - 49** | **15.0%** |
| **50 - 54** | **11.3%** |
| **55 - 59** | **7.5%** |
| **60 - 64** | **6.3%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.6%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.6%** |
| **(Cases) N=** | **160** |
| **mean** | **43** |
| **min size (mm)** | **16** |
| **max size (mm)** | **82** |

## San Clemente Island - Horse Beach Cove

*Tethya aurantia*

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **66.7%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **33.3%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **43** |
| **min size (mm)** | **36** |
| **max size (mm)** | **56** |

*Kelletia kelletii*

| | |
|---|---|
| **< 40** | **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** | **9.1%** |
| **120 - 129** | **63.6%** |
| **130 - 139** | **18.2%** |
| **140 - 149** | **9.1%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **11** |
| **mean** | **128** |
| **min size (mm)** | **119** |
| **max size (mm)** | **145** |

*Megathura crenulata*

| | |
|---|---|
| **<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** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **16.7%** |
| **90 - 99** | **50.0%** |
| **100 - 109** | **33.3%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **94** |
| **min size (mm)** | **84** |
| **max size (mm)** | **104** |

*Haliotis corrugata*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **7.7%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **7.7%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **7.7%** |
| **125 - 134** | **7.7%** |
| **135 - 144** | **15.4%** |
| **145 - 154** | **7.7%** |
| **155 - 164** | **23.1%** |
| **165 - 174** | **7.7%** |
| **175 - 184** | **7.7%** |
| **185 - 194** | **7.7%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **13** |
| **mean** | **142** |
| **min size (mm)** | **59** |
| **max size (mm)** | **186** |

*Lithopoma undosum*

| | |
|---|---|
| **<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** | **10.5%** |
| **70 - 79** | **15.8%** |
| **80 - 89** | **5.3%** |
| **90 - 99** | **42.1%** |
| **100 - 109** | **26.3%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **19** |
| **mean** | **89** |
| **mean** | **89** |
| **min size (mm)** | **61** |
| **max size (mm)** | **107** |

*Pisaster giganteus*

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **28.6%** |
| **100 - 119** | **57.1%** |
| **120 - 139** | **14.3%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **7** |
| **mean** | **106** |
| **mean** | **106** |
| **min size (mm)** | **93** |
| **max size (mm)** | **135** |

*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** | **0.0%** |
| **45 - 49** | **0.0%** |
| **50 - 54** | **1.6%** |
| **55 - 59** | **1.6%** |
| **60 - 64** | **4.7%** |
| **65 - 69** | **2.4%** |
| **70 - 74** | **10.2%** |
| **75 - 79** | **10.2%** |
| **80 - 84** | **11.8%** |
| **85 - 89** | **8.7%** |
| **90 - 94** | **11.0%** |
| **95 - 99** | **13.4%** |
| **100 - 104** | **9.4%** |
| **105 - 109** | **8.7%** |
| **> 109** | **6.3%** |
| **(Cases) N=** | **127** |
| **mean** | **88** |
| **min size (mm)** | **51** |
| **max size (mm)** | **138** |

*Strongylocentrotus purpuratus*

| | |
|---|---|
| **< 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** | **8.3%** |
| **40 - 44** | **16.7%** |
| **45 - 49** | **25.0%** |
| **50 - 54** | **16.7%** |
| **55 - 59** | **8.3%** |
| **60 - 64** | **25.0%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **12** |
| **mean** | **51** |
| **min size (mm)** | **39** |
| **max size (mm)** | **62** |

*Haliotis rufescens*

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.5%** |
| **75 - 84** | **0.5%** |
| **85 - 94** | **1.1%** |
| **95 - 104** | **1.6%** |
| **105 - 114** | **1.6%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **1.1%** |
| **145 - 154** | **5.8%** |
| **155 - 164** | **9.0%** |
| **165 - 174** | **21.2%** |
| **175 - 184** | **21.2%** |
| **185 - 194** | **16.4%** |
| **>195** | **18.0%** |
| **(Cases) N=** | **189** |
| **mean** | **175** |
| **min size (mm)** | **72** |
| **max size (mm)** | **217** |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## San Miguel Island - Wyckoff Ledge

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

| | |
|---|---|
| **< 3** | **14.1%** |
| **3 - 5** | **14.1%** |
| **6 - 8** | **26.9%** |
| **9 - 11** | **6.4%** |
| **12 - 14** | **11.5%** |
| **15 - 17** | **7.7%** |
| **18 - 20** | **7.7%** |
| **21 - 23** | **3.8%** |
| **24 - 26** | **1.3%** |
| **27 - 29** | **3.8%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **2.6%** |
| **36 - 38** | **0.0%** |
| **39 - 41** | **0.0%** |
| **42 - 44** | **0.0%** |
| **> 44** | **0.0%** |
| **(Cases) N=** | **78** |
| **mean** | **11** |
| **min number** | **1** |
| **max number** | **34** |

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

| | |
|---|---|
| **< 6** | **1.3%** |
| **6 - 11** | **14.1%** |
| **12 - 17** | **23.1%** |
| **18 - 23** | **17.9%** |
| **24 - 29** | **12.8%** |
| **30 - 35** | **14.1%** |
| **36 - 41** | **14.1%** |
| **42 - 47** | **2.6%** |
| **48 - 53** | **0.0%** |
| **54 - 59** | **0.0%** |
| **60 - 65** | **0.0%** |
| **66 - 71** | **0.0%** |
| **72 - 77** | **0.0%** |
| **78 - 83** | **0.0%** |
| **84 - 89** | **0.0%** |
| **> 89** | **0.0%** |
| **(Cases) N=** | **78** |
| **mean** | **23** |
| **min width (cm)** | **5** |
| **max width (cm)** | **45** |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## San Miguel Island - Hare Rock

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| **< 3** | **6.9%** | **< 6** | **1.0%** |
| **3 - 5** | **23.8%** | **6 - 11** | **9.9%** |
| **6 - 8** | **27.7%** | **12 - 17** | **34.7%** |
| **9 - 11** | **18.8%** | **18 - 23** | **25.7%** |
| **12 - 14** | **11.9%** | **24 - 29** | **19.8%** |
| **15 - 17** | **5.0%** | **30 - 35** | **5.0%** |
| **18 - 20** | **2.0%** | **36 - 41** | **3.0%** |
| **21 - 23** | **1.0%** | **42 - 47** | **1.0%** |
| **24 - 26** | **1.0%** | **48 - 53** | **0.0%** |
| **27 - 29** | **2.0%** | **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=** | **101** | **(Cases) N=** | **101** |
| **mean** | **9** | **mean** | **19** |
| **min number** | **1** | **min width (cm)** | **5** |
| **max number** | **28** | **max width (cm)** | **44** |

## Santa Rosa Island - Johnson's Lee North

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| **< 3** | **4.6%** | **< 6** | **1.9%** |
| **3 - 5** | **19.4%** | **6 - 11** | **2.8%** |
| **6 - 8** | **35.2%** | **12 - 17** | **11.1%** |
| **9 - 11** | **22.2%** | **18 - 23** | **14.8%** |
| **12 - 14** | **10.2%** | **24 - 29** | **36.1%** |
| **15 - 17** | **5.6%** | **30 - 35** | **15.7%** |
| **18 - 20** | **2.8%** | **36 - 41** | **14.8%** |
| **21 - 23** | **0.0%** | **42 - 47** | **0.0%** |
| **24 - 26** | **0.0%** | **48 - 53** | **2.8%** |
| **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=** | **108** | **(Cases) N=** | **108** |
| **mean** | **8** | **mean** | **27** |
| **min number** | **1** | **min width (cm)** | **4** |
| **max number** | **20** | **max width (cm)** | **51** |

# 2003 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 | 6.4% | < 6 | 0.0% |
| 3 - 5 | 22.0% | 6 - 11 | 6.4% |
| 6 - 8 | 32.1% | 12 - 17 | 18.3% |
| 9 - 11 | 25.7% | 18 - 23 | 32.1% |
| 12 - 14 | 9.2% | 24 - 29 | 23.9% |
| 15 - 17 | 4.6% | 30 - 35 | 11.9% |
| 18 - 20 | 0.0% | 36 - 41 | 5.5% |
| 21 - 23 | 0.0% | 42 - 47 | 1.8% |
| 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= | 109 | (Cases) N= | 109 |
| mean | 8 | mean | 23 |
| min number | 1 | min width (cm) | 8 |
| max number | 17 | max width (cm) | 46 |

## Santa Rosa Island - Rodes Reef

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 52.3% | < 6 | 31.4% |
| 3 - 5 | 28.8% | 6 - 11 | 36.6% |
| 6 - 8 | 17.6% | 12 - 17 | 23.5% |
| 9 - 11 | 0.7% | 18 - 23 | 7.8% |
| 12 - 14 | 0.7% | 24 - 29 | 0.7% |
| 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= | 153 | (Cases) N= | 153 |
| mean | 3 | mean | 9 |
| min number | 1 | min width (cm) | 2 |
| max number | 12 | max width (cm) | 24 |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## Santa Cruz Island - Gull Island South

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

| | |
|---|---|
| < 3 | 0.8% |
| 3 - 5 | 9.7% |
| 6 - 8 | 15.3% |
| 9 - 11 | 20.2% |
| 12 - 14 | 16.9% |
| 15 - 17 | 22.6% |
| 18 - 20 | 9.7% |
| 21 - 23 | 1.6% |
| 24 - 26 | 0.0% |
| 27 - 29 | 2.4% |
| 30 - 32 | 0.0% |
| 33 - 35 | 0.8% |
| 36 - 38 | 0.0% |
| 39 - 41 | 0.0% |
| 42 - 44 | 0.0% |
| > 44 | 0.0% |
| (Cases) N= | 124 |
| mean | 12 |
| min number | 1 |
| max number | 35 |

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

| | |
|---|---|
| < 6 | 0.0% |
| 6 - 11 | 4.8% |
| 12 - 17 | 4.8% |
| 18 - 23 | 11.3% |
| 24 - 29 | 21.8% |
| 30 - 35 | 29.8% |
| 36 - 41 | 15.3% |
| 42 - 47 | 5.6% |
| 48 - 53 | 4.0% |
| 54 - 59 | 0.8% |
| 60 - 65 | 0.8% |
| 66 - 71 | 0.8% |
| 72 - 77 | 0.0% |
| 78 - 83 | 0.0% |
| 84 - 89 | 0.0% |
| > 89 | 0.0% |
| (Cases) N= | 124 |
| mean | 31 |
| min width (cm) | 6 |
| max width (cm) | 70 |

## Santa Cruz Island - Yellow Banks

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

| | |
|---|---|
| < 3 | 58.5% |
| 3 - 5 | 28.5% |
| 6 - 8 | 10.8% |
| 9 - 11 | 1.5% |
| 12 - 14 | 0.0% |
| 15 - 17 | 0.8% |
| 18 - 20 | 0.0% |
| 21 - 23 | 0.0% |
| 24 - 26 | 0.0% |
| 27 - 29 | 0.0% |
| 30 - 32 | 0.0% |
| 33 - 35 | 0.0% |
| 36 - 38 | 0.0% |
| 39 - 41 | 0.0% |
| 42 - 44 | 0.0% |
| > 44 | 0.0% |
| (Cases) N= | 130 |
| mean | 3 |
| min number | 1 |
| max number | 17 |

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

| | |
|---|---|
| < 6 | 7.7% |
| 6 - 11 | 42.3% |
| 12 - 17 | 28.5% |
| 18 - 23 | 16.9% |
| 24 - 29 | 3.1% |
| 30 - 35 | 1.5% |
| 36 - 41 | 0.0% |
| 42 - 47 | 0.0% |
| 48 - 53 | 0.0% |
| 54 - 59 | 0.0% |
| 60 - 65 | 0.0% |
| 66 - 71 | 0.0% |
| 72 - 77 | 0.0% |
| 78 - 83 | 0.0% |
| 84 - 89 | 0.0% |
| > 89 | 0.0% |
| (Cases) N= | 130 |
| mean | 13 |
| min width (cm) | 4 |
| max width (cm) | 34 |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## Anacapa Island - Admiral's Reef

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 80.0% | < 6 | 0.0% |
| 3 - 5 | 10.0% | 6 - 11 | 70.0% |
| 6 - 8 | 10.0% | 12 - 17 | 30.0% |
| 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= | 10 | (Cases) N= | 10 |
| mean | 3 | mean | 9 |
| min number | 2 | min width (cm) | 6 |
| max number | 6 | max width (cm) | 13 |

## Anacapa Island - Cathedral Cove

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 27.6% | < 6 | 2.3% |
| 3 - 5 | 39.1% | 6 - 11 | 27.6% |
| 6 - 8 | 19.5% | 12 - 17 | 43.7% |
| 9 - 11 | 2.3% | 18 - 23 | 9.2% |
| 12 - 14 | 2.3% | 24 - 29 | 6.9% |
| 15 - 17 | 2.3% | 30 - 35 | 3.4% |
| 18 - 20 | 1.1% | 36 - 41 | 2.3% |
| 21 - 23 | 1.1% | 42 - 47 | 2.3% |
| 24 - 26 | 0.0% | 48 - 53 | 1.1% |
| 27 - 29 | 0.0% | 54 - 59 | 1.1% |
| 30 - 32 | 1.1% | 60 - 65 | 0.0% |
| 33 - 35 | 0.0% | 66 - 71 | 0.0% |
| 36 - 38 | 1.1% | 72 - 77 | 0.0% |
| 39 - 41 | 1.1% | 78 - 83 | 0.0% |
| 42 - 44 | 0.0% | 84 - 89 | 0.0% |
| > 44 | 1.1% | > 89 | 0.0% |
| (Cases) N= | 87 | (Cases) N= | 87 |
| mean | 7 | mean | 16 |
| min number | 1 | min width (cm) | 4 |
| max number | 53 | max width (cm) | 56 |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## Anacapa Island - Landing Cove

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 81.3% | < 6 | 12.0% |
| 3 - 5 | 14.0% | 6 - 11 | 71.3% |
| 6 - 8 | 0.7% | 12 - 17 | 12.7% |
| 9 - 11 | 1.3% | 18 - 23 | 0.7% |
| 12 - 14 | 0.7% | 24 - 29 | 1.3% |
| 15 - 17 | 0.0% | 30 - 35 | 0.7% |
| 18 - 20 | 0.0% | 36 - 41 | 0.7% |
| 21 - 23 | 0.0% | 42 - 47 | 0.0% |
| 24 - 26 | 0.7% | 48 - 53 | 0.0% |
| 27 - 29 | 0.0% | 54 - 59 | 0.7% |
| 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 | 0.7% | 78 - 83 | 0.0% |
| 42 - 44 | 0.7% | 84 - 89 | 0.0% |
| > 44 | 0.0% | > 89 | 0.0% |
| (Cases) N= | 150 | (Cases) N= | 150 |
| mean | 3 | mean | 9 |
| min number | 1 | min width (cm) | 3 |
| max number | 42 | max width (cm) | 56 |

## Santa Barbara Island - SE Sea Lion Rookery

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 71.4% | < 6 | 40.8% |
| 3 - 5 | 19.4% | 6 - 11 | 45.9% |
| 6 - 8 | 5.1% | 12 - 17 | 6.1% |
| 9 - 11 | 0.0% | 18 - 23 | 5.1% |
| 12 - 14 | 2.0% | 24 - 29 | 2.0% |
| 15 - 17 | 1.0% | 30 - 35 | 0.0% |
| 18 - 20 | 0.0% | 36 - 41 | 0.0% |
| 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= | 98 | (Cases) N= | 98 |
| mean | 3 | mean | 8 |
| min number | 1 | min width (cm) | 2 |
| max number | 21 | max width (cm) | 24 |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## Santa Barbara Island - Cat Canyon

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| **< 3** | **35.9%** | **< 6** | **2.6%** |
| **3 - 5** | **46.2%** | **6 - 11** | **51.3%** |
| **6 - 8** | **17.9%** | **12 - 17** | **38.5%** |
| **9 - 11** | **0.0%** | **18 - 23** | **7.7%** |
| **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=** | **39** | **(Cases) N=** | **39** |
| **mean** | **4** | **mean** | **11** |
| **min number** | **2** | **min width (cm)** | **5** |
| **max number** | **7** | **max width (cm)** | **18** |

## San Clemente Island - Northwest Harbor

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| **< 3** | **3.8%** | **< 6** | **1.5%** |
| **3 - 5** | **9.1%** | **6 - 11** | **3.0%** |
| **6 - 8** | **3.0%** | **12 - 17** | **2.3%** |
| **9 - 11** | **11.4%** | **18 - 23** | **6.1%** |
| **12 - 14** | **25.0%** | **24 - 29** | **22.7%** |
| **15 - 17** | **17.4%** | **30 - 35** | **25.8%** |
| **18 - 20** | **15.9%** | **36 - 41** | **18.2%** |
| **21 - 23** | **8.3%** | **42 - 47** | **14.4%** |
| **24 - 26** | **5.3%** | **48 - 53** | **6.1%** |
| **27 - 29** | **0.8%** | **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=** | **132** | **(Cases) N=** | **132** |
| **mean** | **14** | **mean** | **32** |
| **min number** | **1** | **min width (cm)** | **4** |
| **max number** | **27** | **max width (cm)** | **53** |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## San Clemente Island - Boy Scout Camp

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| **< 3** | **37.6%** | **< 6** | **34.7%** |
| **3 - 5** | **16.8%** | **6 - 11** | **17.8%** |
| **6 - 8** | **5.0%** | **12 - 17** | **2.0%** |
| **9 - 11** | **7.9%** | **18 - 23** | **1.0%** |
| **12 - 14** | **5.0%** | **24 - 29** | **5.0%** |
| **15 - 17** | **3.0%** | **30 - 35** | **5.0%** |
| **18 - 20** | **3.0%** | **36 - 41** | **5.0%** |
| **21 - 23** | **5.0%** | **42 - 47** | **5.9%** |
| **24 - 26** | **2.0%** | **48 - 53** | **5.0%** |
| **27 - 29** | **1.0%** | **54 - 59** | **5.0%** |
| **30 - 32** | **5.0%** | **60 - 65** | **4.0%** |
| **33 - 35** | **2.0%** | **66 - 71** | **5.0%** |
| **36 - 38** | **3.0%** | **72 - 77** | **1.0%** |
| **39 - 41** | **0.0%** | **78 - 83** | **3.0%** |
| **42 - 44** | **1.0%** | **84 - 89** | **0.0%** |
| **> 44** | **3.0%** | **> 89** | **1.0%** |
| **(Cases) N=** | **101** | **(Cases) N=** | **101** |
| **mean** | **11** | **mean** | **26** |
| **min number** | **1** | **min width (cm)** | **2** |
| **max number** | **55** | **max width (cm)** | **95** |

## San Clemente Island - Eel Point

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| **< 3** | **24.8%** | **< 6** | **12.4%** |
| **3 - 5** | **30.7%** | **6 - 11** | **21.2%** |
| **6 - 8** | **13.9%** | **12 - 17** | **13.9%** |
| **9 - 11** | **10.9%** | **18 - 23** | **24.8%** |
| **12 - 14** | **10.2%** | **24 - 29** | **10.9%** |
| **15 - 17** | **3.6%** | **30 - 35** | **12.4%** |
| **18 - 20** | **1.5%** | **36 - 41** | **3.6%** |
| **21 - 23** | **2.2%** | **42 - 47** | **0.7%** |
| **24 - 26** | **0.7%** | **48 - 53** | **0.0%** |
| **27 - 29** | **0.0%** | **54 - 59** | **0.0%** |
| **30 - 32** | **1.5%** | **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=** | **137** | **(Cases) N=** | **137** |
| **mean** | **7** | **mean** | **18** |
| **min number** | **1** | **min width (cm)** | **3** |
| **max number** | **32** | **max width (cm)** | **43** |

# 2003 Macrocystis pyrifera Size Frequency Distributions

## San Clemente Island - Horse Beach Cove

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 8.5% | < 6 | 4.2% |
| 3 - 5 | 9.3% | 6 - 11 | 8.5% |
| 6 - 8 | 11.9% | 12 - 17 | 16.9% |
| 9 - 11 | 16.1% | 18 - 23 | 15.3% |
| 12 - 14 | 11.9% | 24 - 29 | 14.4% |
| 15 - 17 | 12.7% | 30 - 35 | 13.6% |
| 18 - 20 | 11.0% | 36 - 41 | 14.4% |
| 21 - 23 | 11.9% | 42 - 47 | 6.8% |
| 24 - 26 | 4.2% | 48 - 53 | 3.4% |
| 27 - 29 | 0.8% | 54 - 59 | 0.8% |
| 30 - 32 | 0.8% | 60 - 65 | 0.0% |
| 33 - 35 | 0.0% | 66 - 71 | 0.8% |
| 36 - 38 | 0.0% | 72 - 77 | 0.8% |
| 39 - 41 | 0.0% | 78 - 83 | 0.0% |
| 42 - 44 | 0.8% | 84 - 89 | 0.0% |
| > 44 | 0.0% | > 89 | 0.0% |
| (Cases) N= | 118 | (Cases) N= | 118 |
| mean | 13 | mean | 27 |
| min number | 1 | min width (cm) | 2 |
| max number | 44 | max width (cm) | 72 |

## San Miguel Island - Miracle Mile

| *Macrocystis pyrifera Ad.(>1m) number of stipes* | | *Macrocystis pyrifera Ad.(>1m) holdfast diameters* | |
|---|---|---|---|
| < 3 | 27.1% | < 6 | 0.9% |
| 3 - 5 | 18.7% | 6 - 11 | 23.4% |
| 6 - 8 | 16.8% | 12 - 17 | 20.6% |
| 9 - 11 | 7.5% | 18 - 23 | 15.0% |
| 12 - 14 | 8.4% | 24 - 29 | 13.1% |
| 15 - 17 | 0.9% | 30 - 35 | 4.7% |
| 18 - 20 | 9.3% | 36 - 41 | 10.3% |
| 21 - 23 | 0.9% | 42 - 47 | 4.7% |
| 24 - 26 | 0.9% | 48 - 53 | 4.7% |
| 27 - 29 | 1.9% | 54 - 59 | 1.9% |
| 30 - 32 | 3.7% | 60 - 65 | 0.9% |
| 33 - 35 | 0.0% | 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 | 1.9% | > 89 | 0.0% |
| (Cases) N= | 107 | (Cases) N= | 107 |
| mean | 10 | mean | 23 |
| min number | 1 | min width (cm) | 4 |
| max number | 50 | max width (cm) | 60 |

# 2003 Gorgonian/Stylaster californica Size Frequency Distributions

## Santa Cruz Island - Gull Island South

*Stylaster californica heights*

| | |
|---|---|
| < 3 | 10.0% |
| 3 - 4 | 16.0% |
| 5 - 6 | 26.0% |
| 7 - 8 | 10.0% |
| 9 - 10 | 12.0% |
| 11 - 12 | 14.0% |
| 13 - 14 | 6.0% |
| 15 - 16 | 4.0% |
| 17 - 18 | 2.0% |
| 19 - 20 | 0.0% |
| 21 - 22 | 0.0% |
| 23 - 24 | 0.0% |
| 25 - 26 | 0.0% |
| 27 - 28 | 0.0% |
| 29 - 30 | 0.0% |
| > 30 | 0.0% |
| **(Cases) N=** | **50** |
| **mean** | **7** |
| **min height (cm)** | **1** |
| **max height (cm)** | **18** |

*Stylaster californica widths*

| | |
|---|---|
| < 3 | 8.0% |
| 3 - 4 | 4.0% |
| 5 - 6 | 6.0% |
| 7 - 8 | 10.0% |
| 9 - 10 | 8.0% |
| 1 - 12 | 12.0% |
| 13 - 14 | 6.0% |
| 15 - 16 | 14.0% |
| 17 - 18 | 6.0% |
| 19 - 20 | 6.0% |
| 21 - 22 | 4.0% |
| 23 - 24 | 2.0% |
| 25 - 26 | 4.0% |
| 27 - 28 | 2.0% |
| 29 - 30 | 4.0% |
| > 30 | 4.0% |
| **(Cases) N=** | **50** |
| **mean** | **14** |
| **min width (cm)** | **1** |
| **max width (cm)** | **44** |

*Lophogorgia chilensis heights*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 8 | 0.0% |
| 9 - 12 | 10.0% |
| 13 - 16 | 0.0% |
| 17 - 20 | 20.0% |
| 21 - 24 | 10.0% |
| 25 - 28 | 0.0% |
| 29 - 32 | 20.0% |
| 33 - 36 | 0.0% |
| 37 - 40 | 10.0% |
| 41 - 44 | 20.0% |
| 45 - 48 | 0.0% |
| 49 - 52 | 10.0% |
| 53 - 56 | 0.0% |
| 57 - 60 | 0.0% |
| 61 - 64 | 0.0% |
| 65 - 68 | 0.0% |
| 69 - 72 | 0.0% |
| 73 - 76 | 0.0% |
| 77 - 80 | 0.0% |
| 81 - 84 | 0.0% |
| 85 - 88 | 0.0% |
| 89 - 92 | 0.0% |
| 93 - 96 | 0.0% |
| 97 - 100 | 0.0% |
| > 100 | 0.0% |
| **(Cases) N=** | **10** |
| **mean** | **31** |
| **min height (cm)** | **12** |
| **max height (cm)** | **50** |

*Lophogorgia chilensis widths*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 8 | 10.0% |
| 9 - 12 | 20.0% |
| 13 - 16 | 20.0% |
| 17 - 20 | 0.0% |
| 21 - 24 | 0.0% |
| 24 - 28 | 0.0% |
| 29 - 32 | 10.0% |
| 33 - 36 | 10.0% |
| 37 - 40 | 10.0% |
| 41 - 44 | 10.0% |
| 45 - 48 | 10.0% |
| 49 - 52 | 0.0% |
| 53 - 56 | 0.0% |
| 57 - 60 | 0.0% |
| 61 - 64 | 0.0% |
| 65 - 68 | 0.0% |
| 69 - 72 | 0.0% |
| 73 - 76 | 0.0% |
| 77 - 80 | 0.0% |
| 81 - 84 | 0.0% |
| 85 - 88 | 0.0% |
| 89 - 92 | 0.0% |
| 93 - 96 | 0.0% |
| 97 - 100 | 0.0% |
| > 100 | 0.0% |
| **(Cases) N=** | **10** |
| **mean** | **25** |
| **min width (cm)** | **7** |
| **max width (cm)** | **46** |

# 2003 Gorgonian/Stylaster californica Size Frequency Distributions

## Anacapa Island - Admiral's Reef

*Lophogorgia chilensis heights*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 8 | 0.0% |
| 9 - 12 | 2.8% |
| 13 - 16 | 2.8% |
| 17 - 20 | 5.6% |
| 21 - 24 | 5.6% |
| 25 - 28 | 8.3% |
| 29 - 32 | 5.6% |
| 33 - 36 | 11.1% |
| 37 - 40 | 16.7% |
| 41 - 44 | 11.1% |
| 45 - 48 | 11.1% |
| 49 - 52 | 2.8% |
| 53 - 56 | 13.9% |
| 57 - 60 | 2.8% |
| 61 - 64 | 0.0% |
| 65 - 68 | 0.0% |
| 69 - 72 | 0.0% |
| 73 - 76 | 0.0% |
| 77 - 80 | 0.0% |
| 81 - 84 | 0.0% |
| 85 - 88 | 0.0% |
| 89 - 92 | 0.0% |
| 93 - 96 | 0.0% |
| 97 - 100 | 0.0% |
| > 100 | 0.0% |
| **(Cases) N=** | **36** |
| **mean** | **37** |
| **min height (cm)** | **12** |
| **max height (cm)** | **57** |

*Lophogorgia chilensis widths*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 8 | 0.0% |
| 9 - 12 | 5.6% |
| 13 - 16 | 2.8% |
| 17 - 20 | 8.3% |
| 21 - 24 | 8.3% |
| 24 - 28 | 2.8% |
| 29 - 32 | 8.3% |
| 33 - 36 | 13.9% |
| 37 - 40 | 5.6% |
| 41 - 44 | 5.6% |
| 45 - 48 | 5.6% |
| 49 - 52 | 8.3% |
| 53 - 56 | 22.2% |
| 57 - 60 | 2.8% |
| 61 - 64 | 0.0% |
| 65 - 68 | 0.0% |
| 69 - 72 | 0.0% |
| 73 - 76 | 0.0% |
| 77 - 80 | 0.0% |
| 81 - 84 | 0.0% |
| 85 - 88 | 0.0% |
| 89 - 92 | 0.0% |
| 93 - 96 | 0.0% |
| 97 - 100 | 0.0% |
| > 100 | 0.0% |
| **(Cases) N=** | **36** |
| **mean** | **37** |
| **min width (cm)** | **12** |
| **max width (cm)** | **60** |

## San Clemente Island - Horse Beach Cove

*Muricea fruticosa heights*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 8 | 0.0% |
| 9 - 12 | 0.0% |
| 13 - 16 | 0.0% |
| 17 - 20 | 0.0% |
| 21 - 24 | 100.0% |
| 25 - 28 | 0.0% |
| 29 - 32 | 0.0% |
| 33 - 36 | 0.0% |
| 37 - 40 | 0.0% |
| 41 - 44 | 0.0% |
| 45 - 48 | 0.0% |
| 49 - 52 | 0.0% |
| 53 - 56 | 0.0% |
| 57 - 60 | 0.0% |
| 61 - 64 | 0.0% |
| 65 - 68 | 0.0% |
| 69 - 72 | 0.0% |
| 73 - 76 | 0.0% |
| 77 - 80 | 0.0% |
| 81 - 84 | 0.0% |
| 85 - 88 | 0.0% |
| 89 - 92 | 0.0% |
| 93 - 96 | 0.0% |
| 97 - 100 | 0.0% |
| > 100 | 0.0% |
| **(Cases) N=** | **1** |
| **mean** | **21** |
| **min height (cm)** | **21** |
| **max height (cm)** | **21** |

*Muricea fruticosa widths*

| | |
|---|---|
| < 5 | 0.0% |
| 5 - 8 | 0.0% |
| 9 - 12 | 0.0% |
| 13 - 16 | 0.0% |
| 17 - 20 | 0.0% |
| 21 - 24 | 0.0% |
| 24 - 28 | 0.0% |
| 29 - 32 | 0.0% |
| 33 - 36 | 100.0% |
| 37 - 40 | 0.0% |
| 41 - 44 | 0.0% |
| 45 - 48 | 0.0% |
| 49 - 52 | 0.0% |
| 53 - 56 | 0.0% |
| 57 - 60 | 0.0% |
| 61 - 64 | 0.0% |
| 65 - 68 | 0.0% |
| 69 - 72 | 0.0% |
| 73 - 76 | 0.0% |
| 77 - 80 | 0.0% |
| 81 - 84 | 0.0% |
| 85 - 88 | 0.0% |
| 89 - 92 | 0.0% |
| 93 - 96 | 0.0% |
| 97 - 100 | 0.0% |
| > 100 | 0.0% |
| **(Cases) N=** | **1** |
| **mean** | **34** |
| **min width (cm)** | **34** |
| **max width (cm)** | **34** |

# 2003 Gorgonian/Stylaster californica Size Frequency Distributions

| *Muricea californica heights* | | *Muricea californica widths* | |
|---|---|---|---|
| **< 5** | **2.6%** | **< 5** | **2.6%** |
| **5 - 8** | **15.8%** | **5 - 8** | **2.6%** |
| **9 - 12** | **39.5%** | **9 - 12** | **26.3%** |
| **13 - 16** | **5.3%** | **13 - 16** | **18.4%** |
| **17 - 20** | **5.3%** | **17 - 20** | **13.2%** |
| **21 - 24** | **10.5%** | **21 - 24** | **5.3%** |
| **25 - 28** | **2.6%** | **24 - 28** | **7.9%** |
| **29 - 32** | **5.3%** | **29 - 32** | **0.0%** |
| **33 - 36** | **0.0%** | **33 - 36** | **7.9%** |
| **37 - 40** | **2.6%** | **37 - 40** | **2.6%** |
| **41 - 44** | **0.0%** | **41 - 44** | **0.0%** |
| **45 - 48** | **5.3%** | **45 - 48** | **0.0%** |
| **49 - 52** | **0.0%** | **49 - 52** | **0.0%** |
| **53 - 56** | **2.6%** | **53 - 56** | **13.2%** |
| **57 - 60** | **0.0%** | **57 - 60** | **0.0%** |
| **61 - 64** | **0.0%** | **61 - 64** | **0.0%** |
| **65 - 68** | **2.6%** | **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%** |
| **(Cases) N=** | **38** | **(Cases) N=** | **38** |
| **mean** | **18** | **mean** | **22** |
| **min height (cm)** | **3** | **min width (cm)** | **4** |
| **max height (cm)** | **68** | **max width (cm)** | **56** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Rosa Island - Johnson's Lee North

*Haliotis rufescens*

Number of ARMs sampled: 9

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **50.0%** |
| **35 - 44** | **0.0%** |
| **45 - 54** | **50.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **39** |
| **min size (mm)** | **31** |
| **max size (mm)** | **47** |

*Cypraea spadicea*

Number of ARMs sampled: 9

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **0.0%** |
| **36 - 38** | **0.0%** |
| **39 - 41** | **9.5%** |
| **42 - 44** | **23.8%** |
| **45 - 47** | **26.2%** |
| **48 - 50** | **9.5%** |
| **51 - 53** | **26.2%** |
| **54 - 56** | **4.8%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **42** |
| **mean** | **47** |
| **min size (mm)** | **39** |
| **max size (mm)** | **55** |

*Crassedoma giganteum*

Number of ARMs sampled: 9

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **33.3%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **66.7%** |
| **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%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **34** |
| **mean** | **34** |
| **min size (mm)** | **12** |
| **max size (mm)** | **47** |

*Asterina miniata*

Number of ARMs sampled: 9

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **5.6%** |
| **20 - 29** | **27.8%** |
| **30 - 39** | **16.7%** |
| **40 - 49** | **33.3%** |
| **50 - 59** | **11.1%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **5.6%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **18** |
| **mean** | **39** |
| **mean** | **39** |
| **min size (mm)** | **19** |
| **max size (mm)** | **82** |

*Pisaster giganteus*

Number of ARMs sampled: 9

| | |
|---|---|
| **< 20** | **4.0%** |
| **20 - 39** | **16.0%** |
| **40 - 59** | **52.0%** |
| **60 - 79** | **28.0%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **25** |
| **mean** | **50** |
| **min size (mm)** | **mean7** |
| **min size (mm)** | **7** |
| **max size (mm)** | **79** |

*Pycnopodia helianthoides*

Number of ARMs sampled: 9

| | |
|---|---|
| **< 20** | **20 - 390.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **33.3%** |
| **80 - 99** | **50.0%** |
| **100 - 119** | **16.7%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **240 - 259** | **0.0%** |
| **260 - 279** | **0.0%** |
| **280 - 299** | **> 2990.0%** |
| **280 - 299** | **0.0%** |
| **> 299** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **85** |
| **min size (mm)** | **67** |
| **max size (mm)** | **100** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Rosa Island - Johnson's Lee North

*Strongylocentrotus franciscanus*

Number of ARMs sampled: 9

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.9%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **0.9%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **3.6%** |
| **35 - 39** | **5.4%** |
| **40 - 44** | **5.4%** |
| **45 - 49** | **9.0%** |
| **50 - 54** | **3.6%** |
| **55 - 59** | **13.5%** |
| **60 - 64** | **11.7%** |
| **65 - 69** | **10.8%** |
| **70 - 74** | **9.0%** |
| **75 - 79** | **9.9%** |
| **80 - 84** | **7.2%** |
| **85 - 89** | **4.5%** |
| **90 - 94** | **1.8%** |
| **95 - 99** | **0.9%** |
| **100 - 104** | **1.8%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **111** |
| **mean** | **62** |
| **min size (mm)** | **12** |
| **max size (mm)** | **101** |

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 9

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **16.7%** |
| **15 - 19** | **33.3%** |
| **20 - 24** | **16.7%** |
| **25 - 29** | **16.7%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.0%** |
| **50 - 54** | **0.0%** |
| **55 - 59** | **16.7%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **26** |
| **min size (mm)** | **14** |
| **max size (mm)** | **57** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Rosa Island - Johnson's Lee South

## *Haliotis rufescens*

Number of ARMs sampled: 7

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **12.5%** |
| **35 - 44** | **25.0%** |
| **45 - 54** | **37.5%** |
| **55 - 64** | **12.5%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **12.5%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **8** |
| **mean** | **50** |
| **min size (mm)** | **31** |
| **max size (mm)** | **81** |

## *Cypraea spadicea*

Number of ARMs sampled: 7

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **0.0%** |
| **36 - 38** | **0.0%** |
| **39 - 41** | **0.0%** |
| **42 - 44** | **33.3%** |
| **45 - 47** | **33.3%** |
| **48 - 50** | **33.3%** |
| **51 - 53** | **0.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **46** |
| **min size (mm)** | **43** |
| **max size (mm)** | **49** |

## *Kelletia kelletii*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **100.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **65** |
| **mean** | **65** |
| **min size (mm)** | **64** |
| **max size (mm)** | **65** |

## *Megathura crenulata*

Number of ARMs sampled: 7

| | |
|---|---|
| **<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** | **100.0%** |
| **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** | **62** |
| **mean** | **62** |
| **min size (mm)** | **62** |
| **max size (mm)** | **62** |

## *Crassedoma giganteum*

Number of ARMs sampled: 7

| | |
|---|---|
| **<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** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **100.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **> 139** | **0.0%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **112** |
| **min size (mm)** | **112** |
| **max size (mm)** | **112** |

## *Asterina miniata*

Number of ARMs sampled: 7

Number of ARMs sampled: 7

| | |
|---|---|
| **<10** | **4.3%** |
| **10 - 19** | **18.6%** |
| **20 - 29** | **20.0%** |
| **30 - 39** | **15.7%** |
| **40 - 49** | **14.3%** |
| **50 - 59** | **18.6%** |
| **60 - 69** | **7.1%** |
| **70 - 79** | **1.4%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **70** |
| **mean** | **35** |
| **mean** | **35** |
| **min size (mm)** | **8** |
| **max size (mm)** | **72** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Rosa Island - Johnson's Lee South

## *Pisaster giganteus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 20** | **12.5%** |
| **20 - 39** | **37.5%** |
| **40 - 59** | **37.5%** |
| **60 - 79** | **12.5%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **8** |
| **mean** | **39** |
| **min size (mm)** | **19** |
| **max size (mm)** | **71** |

## *Pycnopodia helianthoides*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **50.0%** |
| **120 - 139** | **50.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **240 - 259** | **0.0%** |
| **260 - 279** | **0.0%** |
| **280 - 299** | **0.0%** |
| **> 299** | **0.0%** |
| **(Cases) N=** | **4** |
| **mean** | **121** |
| **min size (mm)** | **115** |
| **max size (mm)** | **126** |

## *Strongylocentrotus franciscanus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.3%** |
| **15 - 19** | **1.4%** |
| **20 - 24** | **3.8%** |
| **25 - 29** | **9.0%** |
| **30 - 34** | **7.3%** |
| **35 - 39** | **8.0%** |
| **40 - 44** | **6.6%** |
| **45 - 49** | **6.9%** |
| **50 - 54** | **8.3%** |
| **55 - 59** | **6.6%** |
| **60 - 64** | **6.6%** |
| **65 - 69** | **15.3%** |
| **70 - 74** | **8.7%** |
| **75 - 79** | **5.6%** |
| **80 - 84** | **3.1%** |
| **85 - 89** | **1.7%** |
| **90 - 94** | **0.0%** |
| **95 - 99** | **0.3%** |
| **100 - 104** | **0.3%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **288** |
| **mean** | **53** |
| **min size (mm)** | **12** |
| **max size (mm)** | **104** |

## *Strongylocentrotus purpuratus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **1.2%** |
| **10 - 14** | **6.0%** |
| **15 - 19** | **36.1%** |
| **20 - 24** | **28.9%** |
| **25 - 29** | **8.4%** |
| **30 - 34** | **6.0%** |
| **35 - 39** | **6.0%** |
| **40 - 44** | **1.2%** |
| **45 - 49** | **1.2%** |
| **50 - 54** | **2.4%** |
| **55 - 59** | **1.2%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **1.2%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **83** |
| **mean** | **24** |
| **min size (mm)** | **9** |
| **max size (mm)** | **65** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Gull Island South

## *Cypraea spadicea*

Number of ARMs sampled: 14

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **2.6%** |
| **36 - 38** | **9.4%** |
| **39 - 41** | **20.8%** |
| **42 - 44** | **26.0%** |
| **45 - 47** | **29.2%** |
| **48 - 50** | **9.4%** |
| **51 - 53** | **2.6%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **192** |
| **mean** | **43** |
| **min size (mm)** | **33** |
| **max size (mm)** | **52** |

## *Kelletia kelletii*

Number of ARMs sampled: 14

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **100.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **74** |
| **min size (mm)** | **71** |
| **max size (mm)** | **77** |

## *Megathura crenulata*

Number of ARMs sampled: 14

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **100.0%** |
| **20 - 29** | **0.0%** |
| **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=** | **3** |
| **mean** | **16** |
| **min size (mm)** | **15** |
| **max size (mm)** | **17** |

## *Crassedoma giganteum*

Number of ARMs sampled: 14

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **33.3%** |
| **20 - 29** | **16.7%** |
| **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** | **16.7%** |
| **100 - 109** | **33.3%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **59** |
| **min size (mm)** | **10** |
| **max size (mm)** | **105** |

## *Haliotis assimilis*

Number of ARMs sampled: 14

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **33.3%** |
| **45 - 54** | **33.3%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **33.3%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **52** |
| **min size (mm)** | **38** |
| **max size (mm)** | **70** |

## *Asterina miniata*

Number of ARMs sampled: 14

| | |
|---|---|
| **<10** | **1.8%** |
| **10 - 19** | **36.4%** |
| **20 - 29** | **30.9%** |
| **30 - 39** | **14.5%** |
| **40 - 49** | **9.1%** |
| **50 - 59** | **5.5%** |
| **60 - 69** | **1.8%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **55** |
| **mean** | **26** |
| **min size (mm)** | **9** |
| **max size (mm)** | **65** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Gull Island South

## *Pisaster giganteus*

Number of ARMs sampled: 14

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **20.0%** |
| **60 - 79** | **20.0%** |
| **80 - 99** | **60.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **82** |
| **min size (mm)** | **56** |
| **max size (mm)** | **98** |

## *Pycnopodia helianthoides*

Number of ARMs sampled: 14

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **33.3%** |
| **140 - 159** | **33.3%** |
| **160 - 179** | **33.3%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **240 - 259** | **0.0%** |
| **260 - 279** | **0.0%** |
| **280 - 299** | **0.0%** |
| **> 299** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **146** |
| **min size (mm)** | **123** |
| **max size (mm)** | **165** |

## *Strongylocentrotus franciscanus*

Number of ARMs sampled: 14

| | |
|---|---|
| **< 5** | **0.3%** |
| **5 - 9** | **20.7%** |
| **10 - 14** | **29.0%** |
| **15 - 19** | **6.4%** |
| **20 - 24** | **7.0%** |
| **25 - 29** | **5.1%** |
| **30 - 34** | **3.2%** |
| **35 - 39** | **3.2%** |
| **40 - 44** | **1.6%** |
| **45 - 49** | **4.1%** |
| **50 - 54** | **3.8%** |
| **55 - 59** | **3.8%** |
| **60 - 64** | **4.5%** |
| **65 - 69** | **4.1%** |
| **70 - 74** | **2.2%** |
| **75 - 79** | **0.6%** |
| **80 - 84** | **0.3%** |
| **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=** | **314** |
| **mean** | **26** |
| **min size (mm)** | **4** |
| **max size (mm)** | **81** |

## *Strongylocentrotus purpuratus*

Number of ARMs sampled: 14

| | |
|---|---|
| **< 5** | **6.5%** |
| **5 - 9** | **32.4%** |
| **10 - 14** | **19.4%** |
| **15 - 19** | **28.8%** |
| **20 - 24** | **12.2%** |
| **25 - 29** | **0.7%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **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=** | **139** |
| **mean** | **12** |
| **min size (mm)** | **2** |
| **max size (mm)** | **25** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Fry's Harbor

## *Cypraea spadicea*

Number of ARMs sampled: 5

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **10.5%** |
| **36 - 38** | **31.6%** |
| **39 - 41** | **36.8%** |
| **42 - 44** | **21.1%** |
| **45 - 47** | **0.0%** |
| **48 - 50** | **0.0%** |
| **51 - 53** | **0.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **19** |
| **mean** | **39** |
| **min size (mm)** | **35** |
| **max size (mm)** | **42** |

## *Kelletia kelletii*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 40** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **33.3%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **33.3%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **33.3%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **92** |
| **min size (mm)** | **69** |
| **max size (mm)** | **115** |

## *Crassedoma giganteum*

Number of ARMs sampled: 5

| | |
|---|---|
| **<10** | **10.0%** |
| **10 - 19** | **40.0%** |
| **20 - 29** | **10.0%** |
| **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** | **10.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **20.0%** |
| **> 139** | **10.0%** |
| **(Cases) N=** | **10** |
| **mean** | **63** |
| **min size (mm)** | **9** |
| **max size (mm)** | **163** |

## *Asterina miniata*

Number of ARMs sampled: 5

| | |
|---|---|
| **<10** | **2.1%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **36.2%** |
| **30 - 39** | **17.0%** |
| **40 - 49** | **19.1%** |
| **50 - 59** | **23.4%** |
| **60 - 69** | **2.1%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **47** |
| **mean** | **37** |
| **min size (mm)** | **4** |
| **max size (mm)** | **64** |

## *Pisaster giganteus*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **46.7%** |
| **40 - 59** | **26.7%** |
| **60 - 79** | **26.7%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **15** |
| **mean** | **44** |
| **mean** | **44** |
| **min size (mm)** | **24** |
| **max size (mm)** | **71** |

## *Pycnopodia helianthoides*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **100.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **240 - 259** | **0.0%** |
| **260 - 279** | **0.0%** |
| **280 - 299** | **0.0%** |
| **> 299** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **154** |
| **min size (mm)** | **154** |
| **max size (mm)** | **154** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Fry's Harbor

*Strongylocentrotus franciscanus*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **1.4%** |
| **10 - 14** | **1.4%** |
| **15 - 19** | **7.2%** |
| **20 - 24** | **7.2%** |
| **25 - 29** | **8.7%** |
| **30 - 34** | **13.0%** |
| **35 - 39** | **26.1%** |
| **40 - 44** | **21.7%** |
| **45 - 49** | **10.1%** |
| **50 - 54** | **2.9%** |
| **55 - 59** | **0.0%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **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=** | **69** |
| **mean** | **34** |
| **min size (mm)** | **9** |
| **max size (mm)** | **50** |

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 5** | **14.3%** |
| **5 - 9** | **14.3%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **14.3%** |
| **20 - 24** | **42.9%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **14.3%** |
| **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=** | **7** |
| **mean** | **19** |
| **min size (mm)** | **4** |
| **max size (mm)** | **39** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Pelican Bay

## *Cypraea spadicea*

Number of ARMs sampled: 6

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **0.0%** |
| **36 - 38** | **7.9%** |
| **39 - 41** | **36.8%** |
| **42 - 44** | **39.5%** |
| **45 - 47** | **10.5%** |
| **48 - 50** | **0.0%** |
| **51 - 53** | **2.6%** |
| **54 - 56** | **2.6%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **38** |
| **mean** | **42** |
| **min size (mm)** | **37** |
| **max size (mm)** | **55** |

## *Asterina miniata*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **3.2%** |
| **20 - 29** | **16.1%** |
| **30 - 39** | **25.8%** |
| **40 - 49** | **9.7%** |
| **50 - 59** | **19.4%** |
| **60 - 69** | **19.4%** |
| **70 - 79** | **3.2%** |
| **80 - 89** | **3.2%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **31** |
| **mean** | **45** |
| **min size (mm)** | **19** |
| **max size (mm)** | **81** |

## *Strongylocentrotus franciscanus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **5.3%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **0.0%** |
| **25 - 29** | **5.3%** |
| **30 - 34** | **33.3%** |
| **35 - 39** | **26.3%** |
| **40 - 44** | **12.3%** |
| **45 - 49** | **10.5%** |
| **50 - 54** | **1.8%** |
| **55 - 59** | **5.3%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **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=** | **57** |
| **mean** | **37** |
| **min size (mm)** | **10** |
| **max size (mm)** | **59** |

## *Crassedoma giganteum*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **60.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **20.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **> 139** | **20.0%** |
| **(Cases) N=** | **5** |
| **mean** | **56** |
| **min size (mm)** | **23** |
| **max size (mm)** | **142** |

## *Pisaster giganteus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **40.0%** |
| **60 - 79** | **20.0%** |
| **80 - 99** | **30.0%** |
| **100 - 119** | **10.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **10** |
| **mean** | **70** |
| **min size (mm)** | **44** |
| **max size (mm)** | **107** |

## *Strongylocentrotus purpuratus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **15 - 190.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **1.1%** |
| **25 - 29** | **56.8%** |
| **30 - 34** | **28.4%** |
| **35 - 39** | **10.5%** |
| **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=** | **95** |
| **mean** | **30** |
| **min size (mm)** | **24** |
| **max size (mm)** | **43** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Scorpion Anchorage

*Cypraea spadicea*

Number of ARMs sampled: 6

| | |
|---|---|
| **<30** | **2.4%** |
| **30 - 32** | **7.1%** |
| **33 - 35** | **21.4%** |
| **36 - 38** | **26.2%** |
| **39 - 41** | **20.2%** |
| **42 - 44** | **13.1%** |
| **45 - 47** | **8.3%** |
| **48 - 50** | **1.2%** |
| **51 - 53** | **0.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **84** |
| **mean** | **38** |
| **min size (mm)** | **27** |
| **max size (mm)** | **48** |

*Crassedoma giganteum*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **14.3%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **7.1%** |
| **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** | **21.4%** |
| **120 - 129** | **21.4%** |
| **130 - 139** | **21.4%** |
| **> 139** | **14.3%** |
| **(Cases) N=** | **14** |
| **mean** | **107** |
| **min size (mm)** | **12** |
| **max size (mm)** | **163** |

*Pisaster giganteus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **0.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **20.0%** |
| **80 - 99** | **40.0%** |
| **100 - 119** | **20.0%** |
| **120 - 139** | **20.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **100** |
| **mean** | **100** |
| **min size (mm)** | **77** |
| **max size (mm)** | **131** |

*Megathura crenulata*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **33.3%** |
| **40 - 49** | **33.3%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **33.3%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **55** |
| **min size (mm)** | **37** |
| **max size (mm)** | **84** |

*Asterina miniata*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **25.0%** |
| **30 - 39** | **12.5%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **25.0%** |
| **60 - 69** | **25.0%** |
| **70 - 79** | **12.5%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **8** |
| **mean** | **50** |
| **min size (mm)** | **28** |
| **max size (mm)** | **77** |

*Strongylocentrotus franciscanus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 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** | **9.6%** |
| **35 - 39** | **23.1%** |
| **40 - 44** | **50.0%** |
| **45 - 49** | **11.5%** |
| **50 - 54** | **3.8%** |
| **55 - 59** | **1.9%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **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=** | **52** |
| **mean** | **41** |
| **min size (mm)** | **31** |
| **max size (mm)** | **58** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Scorpion Anchorage

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **1.6%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **17.2%** |
| **25 - 29** | **47.5%** |
| **30 - 34** | **26.2%** |
| **35 - 39** | **6.6%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.8%** |
| **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=** | **122** |
| **mean** | **28** |
| **min size (mm)** | **8** |
| **max size (mm)** | **46** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Yellow Banks

## *Haliotis rufescens*

Number of ARMs sampled: 15

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **100.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **38** |
| **min size (mm)** | **38** |
| **max size (mm)** | **38** |

## *Cypraea spadicea*

Number of ARMs sampled: 15

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **2.4%** |
| **33 - 35** | **17.1%** |
| **36 - 38** | **26.8%** |
| **39 - 41** | **29.3%** |
| **42 - 44** | **17.1%** |
| **45 - 47** | **4.9%** |
| **48 - 50** | **2.4%** |
| **51 - 53** | **0.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **41** |
| **mean** | **39** |
| **min size (mm)** | **32** |
| **max size (mm)** | **49** |

## *Kelletia kelletii*

Number of ARMs sampled: 15

| | |
|---|---|
| **< 40** | **37.5%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **12.5%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **12.5%** |
| **90 - 99** | **25.0%** |
| **100 - 109** | **12.5%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **140 - 149** | **0.0%** |
| **> 149** | **0.0%** |
| **(Cases) N=** | **8** |
| **mean** | **60** |
| **mean** | **60** |
| **min size (mm)** | **16** |
| **max size (mm)** | **101** |

## *Lithopoma undosum*

Number of ARMs sampled: 15

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **50.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **50.0%** |
| **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=** | **2** |
| **mean** | **44** |
| **mean** | **44** |
| **min size (mm)** | **21** |
| **max size (mm)** | **67** |

## *Lithopoma gibberosum*

Number of ARMs sampled: 15

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **100.0%** |
| **20 - 29** | **0.0%** |
| **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** | **17** |
| **mean** | **17** |
| **min size (mm)** | **17** |
| **max size (mm)** | **17** |

## *Megathura crenulata*

Number of ARMs sampled: 15

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **0.0%** |
| **30 - 39** | **50.0%** |
| **40 - 49** | **12.5%** |
| **50 - 59** | **12.5%** |
| **60 - 69** | **12.5%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **12.5%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **8** |
| **mean** | **48** |
| **mean** | **48** |
| **min size (mm)** | **32** |
| **max size (mm)** | **85** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Yellow Banks

## *Crassedoma giganteum*

Number of ARMs sampled: 15

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **47.1%** |
| **20 - 29** | **23.5%** |
| **30 - 39** | **11.8%** |
| **40 - 49** | **11.8%** |
| **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%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **5.9%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **17** |
| **mean** | **30** |
| **min size (mm)** | **10** |
| **max size (mm)** | **132** |

## *Haliotis assimilis*

Number of ARMs sampled: 15

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **20.0%** |
| **35 - 44** | **80.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **36** |
| **min size (mm)** | **29** |
| **max size (mm)** | **39** |

## *Asterina miniata*

Number of ARMs sampled: 15

| | |
|---|---|
| **<10** | **1.1%** |
| **10 - 19** | **42.7%** |
| **20 - 29** | **37.1%** |
| **30 - 39** | **14.6%** |
| **40 - 49** | **2.2%** |
| **50 - 59** | **1.1%** |
| **60 - 69** | **1.1%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **89** |
| **mean** | **23** |
| **mean** | **23** |
| **min size (mm)** | **9** |
| **max size (mm)** | **65** |

## *Pisaster giganteus*

Number of ARMs sampled: 15

| | |
|---|---|
| **< 20** | **0.0%** |
| **20 - 39** | **37.8%** |
| **40 - 59** | **43.2%** |
| **60 - 79** | **5.4%** |
| **80 - 99** | **5.4%** |
| **100 - 119** | **8.1%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **37** |
| **mean** | **50** |
| **mean** | **50** |
| **min size (mm)** | **22** |
| **max size (mm)** | **107** |

## *Lytechinus anamesus*

Number of ARMs sampled: 15

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **0.0%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **0.0%** |
| **20 - 24** | **100.0%** |
| **25 - 29** | **0.0%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.0%** |
| **> 49** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **23** |
| **mean** | **23** |
| **min size (mm)** | **23** |
| **max size (mm)** | **23** |

## *Strongylocentrotus franciscanus*

Number of ARMs sampled: 11

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **9.8%** |
| **10 - 14** | **32.9%** |
| **15 - 19** | **12.4%** |
| **20 - 24** | **2.1%** |
| **25 - 29** | **4.5%** |
| **30 - 34** | **7.6%** |
| **35 - 39** | **7.4%** |
| **40 - 44** | **7.5%** |
| **45 - 49** | **8.0%** |
| **50 - 54** | **4.1%** |
| **55 - 59** | **2.1%** |
| **60 - 64** | **1.2%** |
| **65 - 69** | **0.2%** |
| **70 - 74** | **75 - 790.0%** |
| **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=** | **838** |
| **mean** | **25** |
| **min size (mm)** | **6** |
| **max size (mm)** | **66** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Santa Cruz Island - Yellow Banks

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 11

| | |
|---|---|
| **< 5** | **4.6%** |
| **5 - 9** | **23.0%** |
| **10 - 14** | **24.1%** |
| **15 - 19** | **12.6%** |
| **20 - 24** | **16.1%** |
| **25 - 29** | **9.2%** |
| **30 - 34** | **5.7%** |
| **35 - 39** | **2.3%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **1.1%** |
| **50 - 54** | **1.1%** |
| **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=** | **87** |
| **mean** | **17** |
| **min size (mm)** | **3** |
| **max size (mm)** | **50** |

*Centrostephanus coronatus*

Number of ARMs sampled: 15

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **50.0%** |
| **10 - 14** | **50.0%** |
| **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** | **0.0%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **11** |
| **min size (mm)** | **9** |
| **max size (mm)** | **13** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Anacapa Island - Admiral's Reef

## *Cypraea spadicea*

Number of ARMs sampled: 6

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **0.0%** |
| **36 - 38** | **0.0%** |
| **39 - 41** | **50.0%** |
| **42 - 44** | **0.0%** |
| **45 - 47** | **0.0%** |
| **48 - 50** | **0.0%** |
| **51 - 53** | **50.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **2** |
| **mean** | **46** |
| **min size (mm)** | **41** |
| **max size (mm)** | **51** |

## *Megathura crenulata*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **25.0%** |
| **20 - 29** | **25.0%** |
| **30 - 39** | **25.0%** |
| **40 - 49** | **25.0%** |
| **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=** | **4** |
| **mean** | **29** |
| **min size (mm)** | **17** |
| **max size (mm)** | **43** |

## *Crassedoma giganteum*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **20.0%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **0.0%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **20.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **20.0%** |
| **90 - 99** | **20.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **20.0%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **5** |
| **mean** | **81** |
| **min size (mm)** | **22** |
| **max size (mm)** | **138** |

## *Asterina miniata*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **7.3%** |
| **10 - 19** | **25.0%** |
| **20 - 29** | **42.7%** |
| **30 - 39** | **21.9%** |
| **40 - 49** | **2.1%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **1.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **96** |
| **mean** | **23** |
| **min size (mm)** | **5** |
| **max size (mm)** | **60** |

## *Strongylocentrotus franciscanus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **2.5%** |
| **10 - 14** | **6.3%** |
| **15 - 19** | **1.3%** |
| **20 - 24** | **10.1%** |
| **25 - 29** | **38.0%** |
| **30 - 34** | **32.9%** |
| **35 - 39** | **8.9%** |
| **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%** |
| **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=** | **79** |
| **mean** | **27** |
| **min size (mm)** | **8** |
| **max size (mm)** | **37** |

## *Strongylocentrotus purpuratus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **23.9%** |
| **10 - 14** | **19.6%** |
| **15 - 19** | **8.7%** |
| **20 - 24** | **34.8%** |
| **25 - 29** | **13.0%** |
| **30 - 34** | **0.0%** |
| **35 - 39** | **0.0%** |
| **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=** | **92** |
| **mean** | **16** |
| **min size (mm)** | **6** |
| **max size (mm)** | **29** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Anacapa Island - Admiral's Reef

*Centrostephanus coronatus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 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** | **100.0%** |
| **60 - 64** | **0.0%** |
| **65 - 69** | **0.0%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **56** |
| **min size (mm)** | **56** |
| **max size (mm)** | **56** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Anacapa Island - Cathedral Cove

*Cypraea spadicea*

Number of ARMs sampled: 7

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **11.1%** |
| **33 - 35** | **11.1%** |
| **36 - 38** | **31.1%** |
| **39 - 41** | **23.3%** |
| **42 - 44** | **11.1%** |
| **45 - 47** | **10.0%** |
| **48 - 50** | **2.2%** |
| **51 - 53** | **0.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **90** |
| **mean** | **38** |
| **min size (mm)** | **30** |
| **max size (mm)** | **50** |

*Megathura crenulata*

Number of ARMs sampled: 7

| | |
|---|---|
| **<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** | **23** |
| **min size (mm)** | **23** |
| **max size (mm)** | **23** |

*Asterina miniata*

Number of ARMs sampled: 7

| | |
|---|---|
| **<10** | **4.5%** |
| **10 - 19** | **27.0%** |
| **20 - 29** | **23.6%** |
| **30 - 39** | **14.6%** |
| **40 - 49** | **24.7%** |
| **50 - 59** | **4.5%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **1.1%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **89** |
| **mean** | **29** |
| **min size (mm)** | **6** |
| **max size (mm)** | **86** |

*Lithopoma undosum*

Number of ARMs sampled: 7

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **0.0%** |
| **20 - 29** | **14.3%** |
| **30 - 39** | **42.9%** |
| **40 - 49** | **14.3%** |
| **50 - 59** | **0.0%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **28.6%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **> 119** | **0.0%** |
| **(Cases) N=** | **7** |
| **mean** | **47** |
| **min size (mm)** | **28** |
| **max size (mm)** | **78** |

*Crassedoma giganteum*

Number of ARMs sampled: 7

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **18.8%** |
| **20 - 29** | **6.3%** |
| **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** | **6.3%** |
| **100 - 109** | **25.0%** |
| **110 - 119** | **18.8%** |
| **120 - 129** | **18.8%** |
| **130 - 139** | **6.3%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **16** |
| **mean** | **90** |
| **min size (mm)** | **12** |
| **max size (mm)** | **130** |

*Pisaster giganteus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 20** | **44.8%** |
| **20 - 39** | **24.1%** |
| **40 - 59** | **24.1%** |
| **60 - 79** | **6.9%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **29** |
| **mean** | **28** |
| **min size (mm)** | **mean5** |
| **min size (mm)** | **5** |
| **max size (mm)** | **71** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Anacapa Island - Cathedral Cove

*Strongylocentrotus franciscanus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **2.0%** |
| **10 - 14** | **8.5%** |
| **15 - 19** | **25.4%** |
| **20 - 24** | **11.9%** |
| **25 - 29** | **4.0%** |
| **30 - 34** | **7.3%** |
| **35 - 39** | **10.5%** |
| **40 - 44** | **9.9%** |
| **45 - 49** | **8.5%** |
| **50 - 54** | **4.8%** |
| **55 - 59** | **2.5%** |
| **60 - 64** | **1.4%** |
| **65 - 69** | **1.4%** |
| **70 - 74** | **0.0%** |
| **75 - 79** | **0.3%** |
| **80 - 84** | **0.3%** |
| **85 - 89** | **0.6%** |
| **90 - 94** | **0.6%** |
| **95 - 99** | **0.3%** |
| **100 - 104** | **0.0%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **354** |
| **mean** | **31** |
| **min size (mm)** | **8** |
| **max size (mm)** | **96** |

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 5** | **0.6%** |
| **5 - 9** | **3.1%** |
| **10 - 14** | **12.6%** |
| **15 - 19** | **15.6%** |
| **20 - 24** | **6.1%** |
| **25 - 29** | **4.7%** |
| **30 - 34** | **2.7%** |
| **35 - 39** | **3.8%** |
| **40 - 44** | **8.3%** |
| **45 - 49** | **7.9%** |
| **50 - 54** | **13.8%** |
| **55 - 59** | **10.8%** |
| **60 - 64** | **6.4%** |
| **65 - 69** | **2.8%** |
| **70 - 74** | **0.5%** |
| **75 - 79** | **0.2%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **636** |
| **mean** | **36** |
| **min size (mm)** | **3** |
| **max size (mm)** | **75** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Anacapa Island - Landing Cove

## *Haliotis corrugata*

Number of ARMs sampled: 7

| | |
|---|---|
| **<25** | **0.0%** |
| **25 - 34** | **0.0%** |
| **35 - 44** | **100.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **0.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **0.0%** |
| **125 - 134** | **0.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **38** |
| **min size (mm)** | **38** |
| **max size (mm)** | **38** |

## *Cypraea spadicea*

Number of ARMs sampled: 7

| | |
|---|---|
| **<30** | **0.0%** |
| **30 - 32** | **0.0%** |
| **33 - 35** | **6.1%** |
| **36 - 38** | **12.1%** |
| **39 - 41** | **18.2%** |
| **42 - 44** | **24.2%** |
| **45 - 47** | **18.2%** |
| **48 - 50** | **21.2%** |
| **51 - 53** | **0.0%** |
| **54 - 56** | **0.0%** |
| **>56** | **0.0%** |
| **(Cases) N=** | **33** |
| **mean** | **43** |
| **min size (mm)** | **34** |
| **max size (mm)** | **50** |

## *Megathura crenulata*

Number of ARMs sampled: 7

| | |
|---|---|
| **<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=** | **2** |
| **mean** | **22** |
| **mean** | **22** |
| **min size (mm)** | **21** |
| **max size (mm)** | **23** |

## *Crassedoma giganteum*

Number of ARMs sampled: 7

| | |
|---|---|
| **<10** | **0.0%** |
| **10 - 19** | **18.2%** |
| **20 - 29** | **18.2%** |
| **30 - 39** | **0.0%** |
| **40 - 49** | **9.1%** |
| **50 - 59** | **4.5%** |
| **60 - 69** | **4.5%** |
| **70 - 79** | **13.6%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **9.1%** |
| **100 - 109** | **13.6%** |
| **110 - 119** | **4.5%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **4.5%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **22** |
| **mean** | **61** |
| **min size (mm)** | **12** |
| **max size (mm)** | **136** |

## *Asterina miniata*

Number of ARMs sampled: 7

| | |
|---|---|
| **<10** | **1.2%** |
| **10 - 19** | **25.0%** |
| **20 - 29** | **44.0%** |
| **30 - 39** | **15.5%** |
| **40 - 49** | **13.1%** |
| **50 - 59** | **1.2%** |
| **60 - 69** | **0.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **84** |
| **mean** | **26** |
| **min size (mm)** | **mean8** |
| **min size (mm)** | **8** |
| **max size (mm)** | **50** |

## *Pisaster giganteus*

Number of ARMs sampled: 7

| | |
|---|---|
| **< 20** | **20.0%** |
| **20 - 39** | **60.0%** |
| **40 - 59** | **20.0%** |
| **60 - 79** | **0.0%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **10** |
| **mean** | **31** |
| **mean** | **31** |
| **min size (mm)** | **9** |
| **max size (mm)** | **45** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# Anacapa Island - Landing Cove

*Strongylocentrotus franciscanus*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **4.8%** |
| **10 - 14** | **16.9%** |
| **15 - 19** | **24.2%** |
| **20 - 24** | **4.8%** |
| **25 - 29** | **4.6%** |
| **30 - 34** | **9.1%** |
| **35 - 39** | **6.7%** |
| **40 - 44** | **5.4%** |
| **45 - 49** | **5.4%** |
| **50 - 54** | **5.1%** |
| **55 - 59** | **3.0%** |
| **60 - 64** | **2.2%** |
| **65 - 69** | **2.7%** |
| **70 - 74** | **2.2%** |
| **75 - 79** | **0.5%** |
| **80 - 84** | **1.3%** |
| **85 - 89** | **0.8%** |
| **90 - 94** | **0.3%** |
| **95 - 99** | **0.0%** |
| **100 - 104** | **0.0%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **372** |
| **mean** | **30** |
| **min size (mm)** | **5** |
| **max size (mm)** | **91** |

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 5

| | |
|---|---|
| **< 5** | **0.1%** |
| **5 - 9** | **15.3%** |
| **10 - 14** | **27.0%** |
| **15 - 19** | **14.6%** |
| **20 - 24** | **4.8%** |
| **25 - 29** | **3.1%** |
| **30 - 34** | **2.8%** |
| **35 - 39** | **2.1%** |
| **40 - 44** | **3.5%** |
| **45 - 49** | **5.7%** |
| **50 - 54** | **7.5%** |
| **55 - 59** | **7.4%** |
| **60 - 64** | **4.1%** |
| **65 - 69** | **1.8%** |
| **70 - 74** | **0.1%** |
| **75 - 79** | **0.0%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **707** |
| **mean** | **26** |
| **min size (mm)** | **3** |
| **max size (mm)** | **73** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
## San Miguel Island - Miracle Mile

### *Haliotis rufescens*

Number of ARMs sampled: 6

| | |
|---|---|
| **<25** | **10.0%** |
| **25 - 34** | **20.0%** |
| **35 - 44** | **20.0%** |
| **45 - 54** | **0.0%** |
| **55 - 64** | **0.0%** |
| **65 - 74** | **0.0%** |
| **75 - 84** | **0.0%** |
| **85 - 94** | **20.0%** |
| **95 - 104** | **0.0%** |
| **105 - 114** | **0.0%** |
| **115 - 124** | **10.0%** |
| **125 - 134** | **20.0%** |
| **135 - 144** | **0.0%** |
| **145 - 154** | **0.0%** |
| **155 - 164** | **0.0%** |
| **165 - 174** | **0.0%** |
| **175 - 184** | **0.0%** |
| **185 - 194** | **0.0%** |
| **>195** | **0.0%** |
| **(Cases) N=** | **10** |
| **mean** | **71** |
| **min size (mm)** | **14** |
| **max size (mm)** | **134** |

### *Lithopoma gibberosum*

Number of ARMs sampled: 6

| | |
|---|---|
| **<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=** | **2** |
| **mean** | **46** |
| **min size (mm)** | **45** |
| **max size (mm)** | **46** |

### *Crassedoma giganteum*

Number of ARMs sampled: 6

| | |
|---|---|
| **<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** | **100.0%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **100 - 109** | **0.0%** |
| **110 - 119** | **0.0%** |
| **120 - 129** | **0.0%** |
| **130 - 139** | **0.0%** |
| **> 139** | **0.0%** |
| **(Cases) N=** | **1** |
| **mean** | **60** |
| **mean** | **60** |
| **min size (mm)** | **60** |
| **max size (mm)** | **60** |

### *Asterina miniata*

Number of ARMs sampled: 6

| | |
|---|---|
| **<10** | **3.6%** |
| **10 - 19** | **8.9%** |
| **20 - 29** | **30.4%** |
| **30 - 39** | **23.2%** |
| **40 - 49** | **12.5%** |
| **50 - 59** | **17.9%** |
| **60 - 69** | **3.6%** |
| **70 - 79** | **0.0%** |
| **80 - 89** | **0.0%** |
| **90 - 99** | **0.0%** |
| **> 99** | **0.0%** |
| **(Cases) N=** | **56** |
| **mean** | **34** |
| **mean** | **34** |
| **min size (mm)** | **9** |
| **max size (mm)** | **63** |

### *Pisaster giganteus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 20** | **16.7%** |
| **20 - 39** | **50.0%** |
| **40 - 59** | **16.7%** |
| **60 - 79** | **16.7%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **0.0%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **> 239** | **0.0%** |
| **(Cases) N=** | **6** |
| **mean** | **36** |
| **min size (mm)** | **mean19** |
| **min size (mm)** | **19** |
| **max size (mm)** | **68** |

### *Pycnopodia helianthoides*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 20** | **20 - 390.0%** |
| **40 - 59** | **0.0%** |
| **60 - 79** | **33.3%** |
| **80 - 99** | **0.0%** |
| **100 - 119** | **0.0%** |
| **120 - 139** | **0.0%** |
| **140 - 159** | **33.3%** |
| **160 - 179** | **0.0%** |
| **180 - 199** | **0.0%** |
| **200 - 219** | **0.0%** |
| **220 - 239** | **0.0%** |
| **240 - 259** | **0.0%** |
| **260 - 279** | **0.0%** |
| **280 - 299** | **> 2990.0%** |
| **280 - 299** | **0.0%** |
| **> 299** | **0.0%** |
| **(Cases) N=** | **3** |
| **mean** | **81** |
| **min size (mm)** | **33** |
| **max size (mm)** | **144** |

# 2003 Artificial Recruitment Modules Size Frequency Distributions
# San Miguel Island - Miracle Mile

*Strongylocentrotus franciscanus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **1.9%** |
| **10 - 14** | **0.0%** |
| **15 - 19** | **1.9%** |
| **20 - 24** | **3.8%** |
| **25 - 29** | **3.8%** |
| **30 - 34** | **9.4%** |
| **35 - 39** | **5.7%** |
| **40 - 44** | **24.5%** |
| **45 - 49** | **11.3%** |
| **50 - 54** | **5.7%** |
| **55 - 59** | **9.4%** |
| **60 - 64** | **5.7%** |
| **65 - 69** | **3.8%** |
| **70 - 74** | **5.7%** |
| **75 - 79** | **3.8%** |
| **80 - 84** | **0.0%** |
| **85 - 89** | **0.0%** |
| **90 - 94** | **1.9%** |
| **95 - 99** | **1.9%** |
| **100 - 104** | **0.0%** |
| **105 - 109** | **0.0%** |
| **> 109** | **0.0%** |
| **(Cases) N=** | **53** |
| **mean** | **48** |
| **min size (mm)** | **6** |
| **max size (mm)** | **95** |

*Strongylocentrotus purpuratus*

Number of ARMs sampled: 6

| | |
|---|---|
| **< 5** | **0.0%** |
| **5 - 9** | **4.5%** |
| **10 - 14** | **2.3%** |
| **15 - 19** | **2.3%** |
| **20 - 24** | **9.1%** |
| **25 - 29** | **6.8%** |
| **30 - 34** | **2.3%** |
| **35 - 39** | **0.0%** |
| **40 - 44** | **0.0%** |
| **45 - 49** | **0.0%** |
| **50 - 54** | **4.5%** |
| **55 - 59** | **9.1%** |
| **60 - 64** | **31.8%** |
| **65 - 69** | **18.2%** |
| **70 - 74** | **2.3%** |
| **75 - 79** | **6.8%** |
| **> 79** | **0.0%** |
| **(Cases) N=** | **44** |
| **mean** | **52** |
| **min size (mm)** | **5** |
| **max size (mm)** | **76** |

Appendix K.

**2003 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: | 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 |
| CHLOROPHYTA | | | | | | | | | | | | | | | | | | | | |
| **BRYOPSIS SP.** | | | | | | | | | | | | | | 1 | | | X | | | |
| **CHAETOMORPHA SP.** | | | | | | | | | | | | | | | | X | | | | |
| **CHAETOMORPHA SPIRALIS** | | | | | | | | | | | | | | | | | 1 | 2 | 1 | |
| **CODIUM CUNEATUM** | | | | | | | | | | | | | 2 | | | | | | | |
| **CODIUM FRAGILE** | | X | | | | | 3 | 2 | 1 | | 2 | X | | 2 | 2 | 2 | | | | |
| **CODIUM HUBBSII/SETCHELLII** | | | | X | | 1 | | | | | | | | 3 | 2 | 2 | | | | 1 |
| **CODIUM JOHNSTONEI** | | | | | | | | | | | 2 | | | | | | | | | |
| **CODIUM SETCHELLII** | | | | | X | | | X | X | | | | | 4 | | | | | | |
| **DERBESIA MARINA** | | | | | | | | | | | | | 2 | | | | | | | |
| **ENTEROMORPHA SP.** | | | | | | | | | | | | | | | | X | | | | |
| **HALICYSTIS OVALIS** | | | | | | | | | | | | | 2 | X | 2 | 2 | X | | X | |
| **ULVA SP.** | | 4 | | | | | | | | | | | | | | | | | | |
| PHAEOPHYTA | | | | | | | | | | | | | | | | | | | | |
| **AGARUM FIMBRIATUM** | | | | | | 1 | | | | | | | | | | | | 2 | | |
| **COLPOMENIA SP.** | | | | | | | 1 | 1 | 2 | | X | 2 | | 2 | 2 | 3 | | | | |
| **COLPOMENIA PEREGRINA** | | | | | | | | | | | | | 2 | 2 | | | | | | |
| **CYSTOSEIRA SP.** | 2 | 0 | 3 | 2 | 1 | | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 3 | 2 | 1 | X | 0 | 2 | 2 |
| **CYSTOSEIRA OSMUNDACEA** | 2 | | 3 | 2 | | | | | | | | | 2 | 3 | | | | | | |
| **CYSTOSEIRA SETCHELLII** | | | | | | | | | | | | | | | | | | 2 | | 2 |
| **DESMARESTIA SP.** | 1 | 3 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| **DESMARESTIA LIGULATA** | 2 | 3 | | | | | | | | | | | | 2 | | | | | | |
| **DICTYONEUROPSIS RETICULATA** | 2 | | | | | | | | | | | | | | | | | | | |
| **DICTYOPTERIS NEW SP.** | | | | | | | | | | | | | X | | | | | | | |
| **DICTYOPTERIS UNDULATA** | | | | | | | | | | | | | X | 3 | | | | X | | 2 |
| **DICTYOTA SP.** | | | | | | | | | | | | | | 2 | | | | 3 | | 2 |
| **DICTYOTA FLABELLATA** | | | | | | | | | | | | | 2 | | | | | | | |
| **DICTYOTA/PACHYDICTYON** | | | X | X | | | | 1 | 1 | X | 1 | X | 2 | 2 | 2 | 2 | | | | |
| **EGREGIA MENZIESII** | d | 1 | | | | | | | | | | | d | 2 | | | | | | |
| **EISENIA ARBOREA** | 1 | J1 | 1/J2 | 1/J1 | 0 | 2/J2 | 0/J1 | 0 | 0/J1 | 0/J1 | 1/J2 | 2/J1 | 2/J2 | 2/J2 | 2/J3 | 2/J2 | 2/J1 | 2/J2 | 2/J1 | 2/J2 |
| **LAMINARIA FARLOWII** | 0 | 0 | 1/J1 | 2/J1 | 0/J1 | 0/J1 | 0 | 0 | 0 | 0/J1 | 0 | 1 | 2 | 0 | 0 | 0 | 1/J1 | | 3/J4 | 2/J2 |
| **MACROCYSTIS PYRIFERA** | 3/J2 | 2/J2 | 4/J3 | 3/J2 | 2/J3 | 3/J2 | 0 | 0 | 0/J1 | 4/J4 | 1/J1 | 2/J2 | 3/3 | 3/J3 | 1/J1 | 2/J2 | 4/J3 | 3/J4 | 4/J4 | 4/J4 |
| **PACHYDICTYON CORIACEUM** | | | | | | | | | | | | | | 2 | | | 2 | 3 | 3 | |
| **PTERYGOPHORA CALIFORNICA** | 2/J2 | 0/J1 | 2/J2 | 2/J2 | 0/J1 | | 0 | 0 | 0 | 2/J2 | 0 | 0 | 2/J2 | 0 | 0 | 0 | 0/J1 | | 1 | |
| **SARGASSUM SP.** | | | | | | | | | | | | | | | X | | | | | |
| **ZONARIA FARLOWII** | | | | | | | | | | | | | | | | | | X | | 2 |
| RHODOPHYTA | | 2 | 2 | 3 | | | 2 | | | 2 | 2 | | | 2 | 3 | 2 | | | | |
| **BONNEMAISONIA HAMIFERA** | | | | | | | | | | | | | | 2 | | | | | | |
| **BOSSIELLA SP.** | | | | | | | | | | | | | | 2 | X | X | | | | |
| **BOSSIELLA ORBIGNIANA** | | | | | | | | | | | | | | | | | 3 | | 4 | |
| **BOSSIELLA/CALLIARTHRON** | | | | | | | | | | | | | 2 | | | | | | | |
| **BOTRYOCLADIA SP.** | | X | | | | | | | | | | | | | | | | | | |
| **BOTRYOCLADIA PSEUDODICHOTOMA** | | | | | | | | | | | | | | | | | X | | X | |

| 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 |
| CALLIARTHRON SP. | | | | | | | | | | | | | | | | | | | | 3 |
| CALLIARTHRON CHEILOSPORIOIDES | X | | | | | | | | | | | | | | | | | | | |
| CALLOPHYLLIS SP. | | | X | | | | | | | | | | | | | | | | | |
| CARPOPELTIS BUSHIAE | | | | | | | | | | | | | 2 | | | | | | | |
| CORALLINA SP. | | | | | | | | | | | | | | 2 | X | X | | | | |
| CORALLINA OFFICINALIS | | | | | | | | | | | | | | | | | X | | | 3 |
| CORALLINES - ENCRUSTING | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 |
| CORALLINES - ERECT | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 4 | 3 |
| GELIDIUM SP. | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 0 | | | | |
| GELIDIUM NUDIFRONS | | | | | | | | | | | | | | | | | 3 | | 2 | 2 |
| GELIDIUM ROBUSTUM | | | | | | | 1 | | | | | | 3 | | 2 | | X | | X | |
| GIGARTINA SP. | 2 | 1 | 2 | 2 | 1 | X | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 1 | 1 | | | | |
| GIGARTINA CORYMBIFERA | 2 | 1 | 2 | 2 | X | | | | | | | | 2 | 1 | 1 | 1 | | | | |
| GRACILARIA ROBUSTA | | | | | | | | | | | | | | 1 | | | | | | |
| GRATELOUPIA DORYPHORA | | | | | | | | | | | | | | 2 | | | | | | |
| HALIPTYLON GRACILE | | | | | | | | | | | | | | | | | X | | X | X |
| LAURENCIA SP. | | | | | 2 | | | | | | | | 2 | | | | X | | 2 | X |
| LAURENCIA PACIFICA | | 1 | | | | X | 2 | 2 | 2 | | 3 | X | | 4 | 3 | 2 | | | | |
| LEPTOCLADIA BINGHAMIAE | | | | | | | | | | | | | | | | | | | | 1 |
| LITHOTHAMNION/LITHOPHYLUM | | | | | | | | | | | | | X | | | | X | | | |
| MARIPELTA ROTATA | 1 | | | | | | | | | | | | | | | | | | | |
| PLOCAMIUM SP. | | X | | | | | | | | | | | | | | | | | | |
| PLOCAMIUM CARTILAGINEUM | | | | | | | | | | | | | 3 | | | | | | X | 1 |
| POLYSIPHONIA SP. | | | | | | | | | | | | | | 3 | | | | | | |
| PRIOPELTIS | | | | | | | | | | | | | | | | | | | | 2 |
| PTEROCLADIA SP. | | | | | | | | | | | | | | | | | | | | 2 |
| RHODOGLOSSUM SP. | | | | | | | | | | | | | | | | | X | | X | |
| RHODYMENIA SP. | | | | | X | | | | | | | | 2 | | | | | 2 | | |
| RHODYMENIA ARBORESCENS | | | | | | | | | | | | | 2 | | | | | | | |
| RHODYMENIA CALIFORNICA | | | | | | | | | | | | | | | | | X | | | |
| SARCODIOTHECA GAUDICHAUDII | X | | | | | | | | | | | | | | | | | | | |
| SCHIZYMENIA SP. | | | | | 2 | | | | | | | | | | | | | | | |
| SCHIZYMENIA EPIPHYTICA | | | | | | X | | | | | | | | 2 | | | | | | |
| SCIADOPHYCUS STELLATUS | | | | | | | | | | | | | 3 | | | | | | | |
| SCINAIA SP. | | | | | | | | | | | | | | | | | | | | 1 |
| SCINAIA ARTICULATA | | | | | | | | | | | | | | 1 | | | | | | |
| FILAMENTOUS RED ALGAE | | X | | | X | | X | 3 | X | | 2 | | | 4 | 2 | 2 | 2 | | | X |
| HYPSYPOPS TURF NEST | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 4 | 1 | 0 | 0 | 0 | 1 |
| ANGIOSPERMA | | | | | | | | | | | | | | | | | | | | |
| PHYLLOSPADIX SP. | d | | | | | | | | | | | | d | | | | | | | |
| PHYLLOSPADIX TORREYI | | | | | | | | | | | | | | | | | | | | d |
| ZOSTERA MARINA | | | | | | | | | | | | | d | | | | | | | |

| 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 |
| BACTERIA | | | | | | | | | | | | | | | | | | | | |
| DIATOMS | | | | | | | | | | | | | | 2 | 2 | 2 | | | | |
| **DIATOM FILM** | 1 | | | | | | 1 | 2 | 1 | 1 | 1 | | | | | | | | | |
| PROTOZOA | | | | | | | | | | | | | | | | | | | | |
| **HOMOTREMA RUBRUM** | | | | | | 2 | X | | X | X | | | X | | | | | | | |
| PORIFERA | | | 2 | 3 | 2 | | 2 | 1 | 2 | 2 | 3 | | 2 | 2 | 1 | 1 | 2 | | 2 | |
| **CLATHRINA BLANCA** | | | | | | | | | | | | | | | | 1 | X | | | 2 |
| **LEUCETTA LOSANGELENSIS** | | | | | | | | | | | | | X | | | | | | | |
| **LEUCILLA NUTTINGI** | | | | | | | | | | | | | X | | | | X | | X | |
| **LEUCOSOLENIA ELEANOR** | | | | | | | | | | | | | | | | | X | 2 | | 1 |
| **YELLOW SPONGE W/TALL PORES** | X | | X | | X | | | | | | | | | | | | | | | |
| **CLIONA SP.** | 3 | X | 3 | X | X | | | | | | | | | | | | | | | |
| **CLIONA CELATA** | 3 | | | | | | | | | | X | | | | | | | | | |
| **HALICLONA SP.** | | | | | | | | | | | | | | | | | | | | X |
| **HALICLONA PERMOLLIS** | | | | | | | | | | | | | X | | | | | | | |
| **HYMENAMPHIASTRA CYANOCRYPTA** | | | 2 | | | X | | | | | 2 | | 2 | | | | X | | | 1 |
| **LISSODENDORYX TOPSENTI** | | | | | | | | | | | | | X | | | | | | | |
| **OPHALITASPONGIA PENNATA** | | | | | | | | | | | | | X | | | | | | | |
| **PENARES CORTIUS** | | | | | | | | | | | | | X | | | | | | | |
| **POLYMASTIA PACHYMASTIA** | 2 | X | | | | | | | | | | | | | | | | | | |
| **RED SPONGES - ENCRUSTING** | X | | 3 | X | X | X | | X | X | X | X | X | X | X | | | X | X | X | X |
| **SPHECIOSPONGIA CONFOEDERATA** | | | | X | | | | | | | | | | | | | | | | |
| **TETHYA AURANTIA** | 3 | 1 | 3 | 3 | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 0 | 1 | 3 | 1 | 0 | 1 | 0 | 0 | 1 |
| **TETILLA ARB** | X | | | | 2 | | | | | | | | | | | | | | | |
| **VERONGIA AUREA** | | | | | | | | | | | | | X | | | | | | | X |
| **XESTOSPONGIA TRINDINAEA** | 2 | | X | | 2 | | | | | | X | | X | | | | | | | |
| **XESTOSPONGIA VANILLA** | | | X | | | | | | | | | | | | | | | | | |
| CNIDARIA | | | | | | | | | | | | | | | | | | | | |
| HYDROZOA | | | | | | | | | | | 3 | 3 | | | | | 2 | | | |
| **ABIETINARIA SP.** | X | | | | | | | | | | | | | | | | | | | |
| **AGLAOPHENIA SP.** | 2 | | | | | | | | | | | | 2 | | | | | | | |
| **ALLOPORA CALIFORNICA (STYLASTER CALIFORNICUS)** | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| **GARVEIA ANNULATA** | 3 | | | | | 2 | | | | | | | | | | | | | | |
| **LYTOCARPUS NUTTINGI** | | | | | | | | | | | | | | | | | | 1 | | |
| **OBELIA SP.** | X | X | X | X | | X | | | | | 2 | X | 3 | X | X | X | 2 | | | X |
| **PLUMULARIA SP.** | X | X | | X | 2 | X | | | | | 2 | 2 | 2 | | | | | | | |
| **SERTULARELLA SP./SERTULARIA SP.** | X | X | | X | | X | X | X | X | X | 2 | X | | X | X | | | | | |
| **PACHYCERIANTHUS FIMBRIATUS** | 2 | 2 | X | X | X | | 2 | X | 2 | 3 | 2 | X | X | X | X | | | | | |
| **HYDRACTINIA MILLERI** | 2 | | | | X | | 2 | X | | | X | X | | | X | | | | | |

| 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 |
| **SIPHONOPHORES** | | | | | X | | | | | | | | | | | | | 1 | | |
| ANTHOZOA | | | | | | | | | | | | | | | | | | | | |
| **EUGORGIA RUBENS** | | | | | 0 | 0 | 2 | | | | 4 | | | | | | | 2 | | |
| **LOPHOGORGIA CHILENSIS** | 0 | 0 | 2 | 2 | 1 | 2 | 4 | 3 | 1 | 2 | 2 | 1 | 1 | 3 | 1 | 0 | 0 | 1 | 0 | 1 |
| **MURICEA CALIFORNICA** | 0 | 0 | 2 | 1 | 0 | 2 | 1 | 1 | 0 | 2 | 3 | | | 3 | 2 | 0 | 0 | 2 | 0 | 2 |
| **MURICEA FRUTICOSA** | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 2 | 0 | 1 |
| **CORYNACTIS CALIFORNICA** | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 0 |
| **ANTHOPLEURA ARTEMISIA** | | | | | | | | | | | | | 1 | | | | | | | 1 |
| **ANTHOPLEURA SOLA** | X | X | 2 | | | | | | | | | X | 1 | | X | X | | | | |
| **CACTOSOMA/SAGARTIA** | | | | | | | | | | | 2 | | | X | X | X | | | | |
| **CACTOSOMA ARENARIA** | | | | | | | | | | | | | | | | | | | | 1 |
| **EPIACTIS PROLIFERA** | X | X | 2 | X | 2 | | | | | | | | | | | | X | | | |
| **HALCAMPA DECEMTENTACULATA** | | X | | | | | | | | | | | | | | | | | | |
| **TEALIA COLUMBIANA** | | | | X | X | | | | | | | | | | | | | | | |
| **TEALIA CORIACEA** | | X | X | X | 2 | X | 1 | | | X | 2 | X | | 3 | | | | | | |
| **TEALIA CRASSICORNIS** | | | | | X | | | | | | | | X | | | | | | | |
| **TEALIA LOFOTENSIS** | 4 | 1 | 2 | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| **ZAOLUTUS ACTIUS** | X | | | | | | | | | | | | | | | | | | | |
| ORDER MADREPORARIA | | | | | | | | | | | | | | | | | | | | |
| **ASTRANGIA LAJOLLENSIS (=A. HAIMEI)** | 1 | 3 | 2 | 2 | 3 | 1 | 4 | 4 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| **BALANOPHYLLIA ELEGANS** | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 0 |
| **COENOCYATHUS BOWERSI** | | | | | | | | | | | 2 | | 3 | | | | | X | | |
| **PARACYATHUS STEARNSI (=P. STEARNSII)** | X | X | X | X | X | 2 | X | | X | 2 | X | X | 2 | | | | | | | |
| CTENOPHORA | | | | | | | | | | | | | | | | | | | | |
| PLATYHELMINTHES | | | | | X | X | | X | X | | | 2 | X | | | | | | | |
| **PROSTHECERAEUS BELLOSTRIATUS** | | | | | | | | | | | | | X | | | | | | | |
| NEMERTEA | | | | | 2 | | | | | | | | | | | | | | | |
| SIPUNCULA | | | | | X | | | | | | | | | | | | | | | |
| ECHIURA | | | | | | | | | | | | | | | | | | | | |
| ANNELIDA | | | | | | | | | | | | | | | | | | | | |
| POLYCHAETA | | | | | | | | | | | | | | | | | | | | |
| **APHRODITE** | | X | | | | | | | | | | | | | | | | | | |
| **ARCTONOE SP.** | | | | | | | | | | | | | X | | | | | | | |
| **CHAETOPTERUS VARIOPEDATUS** | X | X | | | 2 | 2 | 2 | 3 | 2 | X | X | X | X | 2 | 2 | 2 | | | X | X |
| **DIOPATRA ORNATA** | 3 | 2 | 3 | 1 | 2 | 2 | 0 | | | 2 | | 1 | | 1 | 1 | 1 | | 2 | X | 2 |
| **DODECACERIA FEWKESI** | 2 | 3 | | | 2 | | X | | | | 2 | | | | | | | | | |
| **EUDISTYLIA POLYMORPHA** | 2 | 2 | 2 | 2 | X | X | | X | | | X | | 1 | | | | | | | |
| **MYXICOLA INFUNDIBULUM** | X | | | | 2 | | X | | X | X | | X | | | | | | | | |
| **PHRAGMATOPOMA CALIFORNICA** | 1 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| **PISTA ELONGATA** | 2 | 2 | 2 | 2 | 2 | 2 | X | X | X | 2 | X | X | X | X | X | | | | | 2 |

| 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 |
| **SABELLID** | | | | | | | | | | | | | | | | | | | | X |
| **SALMACINA TRIBRANCHIATA** | | X | 2 | X | X | 2 | X | | | X | 2 | X | 2 | X | X | X | | | | |
| **SPIROBRANCHUS SPINOSUS** | | | 2 | | | X | 3 | 4 | 3 | X | 3 | 3 | 3 | 2 | 3 | 3 | 1 | | 1 | 1 |
| **SPIRORBID** | X | 3 | | | | | | | | | | | | | | | X | | | |
| **TEREBELLID** | | 2 | | | | | | X | | | | | | | | | | | | |
| **POLYCHAETE "BALLOONS"** | | X | | | | | | | X | | | X | | | | | | | | |
| ARTHROPODA | | | | | | | | | | | | | | | | | | | | |
| PYCNOGONIDA | | | | | | | | | | | | | | | | | | | | |
| CRUSTACEA | | | | | | | | | | | | | | | | | | | | |
| CIRRIPEDIA/THORACIA | | | | | | | | | | | | | | | | | | | | |
| **BALANUS SP.** | | | | | | X | 3 | X | | | 2 | | | | | | X | | | |
| **BALANUS AQUILA/NUBILUS** | X | | | X | | S | | | | | | | | | | | | | | |
| **BALANUS NUBILUS** | | | | | X | | | | | | | | | | | | | | | |
| **CONOPEA GALEATA** | | | | | | | | | | | | | | X | | | | | | |
| **MEGABALANUS CALIFORNICUS** | | | | | | | | | | | X | | | | | | | | | |
| MALACOSTRACA | | | | | | | | | | | | | | | | | | | | |
| **MYSIDS (brown canopy dwellers)** | X | | | | 2 | X | | | | | | | | | | | | | | |
| ISOPODA | | | | | | | | | | | | | | | | | | | | |
| **COLIDOTEA SP.** | | | | | | | | | | | | X | X | | | | | | | |
| **IDOTEA RESECATA** | 3 | 2 | 4 | 4 | 2 | 2 | 0 | 0 | 0 | 1 | | | | 0 | 0 | 0 | 2 | | X | |
| AMPHIPODA | | | | | | | | | | | | | | | | | | | | |
| **AMPHIPOD TUBE MASSES** | 3 | 2 | 2 | 2 | 1 | 3 | | | | 2 | 3 | X | | 3 | 3 | X | | | | |
| GAMMARIDEA | | | | | | | | | | | | | | | | | | | | |
| CAPRELLIDEA | | | | | | | | | | | | | | | | | | | | |
| EUPHSUSIACEA | | | | | | | | | | | | | | | | | | | | |
| **COPEPODS ON MEGATHURA CRENULATA** | | | | | | | | | | | | X | | | | | | | | |
| **COPEPODS ON FISH** | | | | X | 3 | X | X | | | | X | X | X | | X | | | 2 | | |
| DECAPODA | | | | | | | | | | | | | | | | | | | | |
| **ALPHEUS SP.** | X | | | | | X | | | | | | | X | | | | | | | |
| **ALPHEUS CLAMATOR** | | | | | | | | | X | | | | | | | | | | | |
| **BETAEUS MACGINITIEAE** | X | 2 | 2 | 2 | | X | | | | 0 | | | X | | | X | | | | |
| **LYSMATA CALIFORNICA** | | | | | | | | X | | | | | X | | | | | | | |
| **PANDALUS DANAE** | 2 | 2 | 2 | 2 | X | 3 | X | | X | 2 | 2 | | X | X | | | | | | |
| **SPIRONTOCARIS PRIONATA** | X | X | | X | X | X | | | | | | | | | | | | | | |
| **PANULIRUS INTERRUPTUS** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 0 | 3 | 3 | 0 | 3 | 2 | 3 | 1 | 1 | 3 |
| **HAPALOGASTER CAVICAUDA** | X | | X | X | X | X | | | | X | | | | | | | | | | |
| **PAGURISTES SP.** | X | X | | | X | X | X | | | X | X | X | X | | | | X | | | 3 |
| **PAGURUS SP.** | | | | | X | X | X | X | X | X | X | X | X | | | | | | | |
| **PETROLISTHES SP.** | | X | | | X | | | X | | | | X | X | | | | | | | |
| **PETROLISTHES CABRILLOI** | X | | | | | | | | | | | | | | | | | | | |
| **CANCER SP.** | | | X | | | X | | | | | | | | | | | | | | |
| **CANCER ANTENNARIUS** | 2 | X | | X | 2 | 1 | X | | | | | | | | | | | | | |
| **CANCER PRODUCTUS** | 2 | | | | 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** |
| **HERBSTIA PARVIFRONS** | | | X | | X | X | X | X | X | | X | X | X | | X | | | | | X |
| **LOXORHYNCHUS CRISPATUS** | 2 | X | | | | | | | | | 0 | | | | | | | | | |
| **LOXORHYNCHUS GRANDIS** | 0 | 0 | 0 | 0 | | | | | | | 0 | | | 1 | | | | | | |
| **PARAXANTHIAS TAYLORI** | | | | | X | X | | X | X | | | 3 | X | s | s | s | | | | |
| **PELIA TUMIDA** | | | | | | | | | | | | X | X | | | | | | | |
| **PHYLLOLITHODES PAPILLOSUS** | | | | X | | | | | | | | | | | | | | | | |
| **PODOCHELA HEMPHILLI** | | | | | | X | | | | | | | | | | | | | | |
| **PUGETTIA SP.** | | | | | | X | | | | | | | | | | | | | | |
| **PUGETTIA PRODUCTA** | 2 | X | | | | X | | | | | | | | X | | | | | | |
| **PUGETTIA RICHII** | X | | | | | | | | | | | | | | | | | | | |
| **TALIEPUS NUTTALLI** | | | | | | | | | | | | | | | | | X | | | |
| ARACHNIDA | | | | | | | | | | | | | | | | | | | | |
| ACARINA | | | | | | | | | | | | | | | | | | | | |
| INSECTA | | | | | | | | | | | | | | | | | | | | |
| DIPTERA | | | | | | | | | | | | | | | | | | | | |
| CHLOROPIDAE | | | | | | | | | | | | | | | | | | | | |
| CHIRONOMIDAE | | | | | | | | | | | | | | | | | | | | |
| COELOPIDAE | | | | | | | | | | | | | | | | | | | | |
| EPHYDRIDAE | | | | | | | | | | | | | | | | | | | | |
| COLEPTERA | | | | | | | | | | | | | | | | | | | | |
| STAPHYLINIDAE | | | | | | | | | | | | | | | | | | | | |
| CARABIDAE | | | | | | | | | | | | | | | | | | | | |
| HYDRAENIDAE | | | | | | | | | | | | | | | | | | | | |
| CURCULIONIDAE | | | | | | | | | | | | | | | | | | | | |
| HISTERIDAE | | | | | | | | | | | | | | | | | | | | |
| HYDROPHILIDAE | | | | | | | | | | | | | | | | | | | | |
| HEMIPTERA | | | | | | | | | | | | | | | | | | | | |
| SALIDIIDAE | | | | | | | | | | | | | | | | | | | | |
| MOLLUSCA | | | | | | | | | | | | | | | | | | | | |
| GASTROPODA | | | | | | | | | | | | | | | | | | | | |
| **ACMAEA MITRA** | 4 | | | | | | | | | | | | | | | | | | | |
| **AMPHISSA VERSICOLOR** | | | X | X | X | X | X | | X | 2 | | | | | | | | | | |
| **LITHOPOMA GIBBEROSUM (=Astraea gibberosa)** | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2/J0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **LITHOPOMA UNDOSUM (=Astraea undosa)** | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 2/J1 | 2/J0 | 2/J2 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| **BURSA CALIFORNICA (=Crossata californica)** | 2 | | X | | | | | | | X | X | | | X | X | | | | | |
| **CALLIOSTOMA SP.** | | X | | | 3 | X | | | 2 | | | | | | | | | | | |
| **CALLIOSTOMA GLORIOSUM** | X | | | | | | | | | | | | | | | | | | | |
| **CERATOSTOMA FOLIATUM** | X | 2 | | | | | | | | | | | | | | | | | | |
| **CERATOSTOMA NUTTALLI** | | | | | | | | 3 | 4 | X | 3 | | X | | | | X | | | X |
| **CONUS CALIFORNICUS** | 2 | | X | | | X | | X | X | X | X | X | X | X | X | X | X | | X | X |
| **CREPIDULA SP.** | | X | X | | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| **CREPIDULA DORSATA** | X | | | | | | | | | | | | | | | | | | | |

| 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 |
| CREPIDULA NORRISARUM | X | | | | | | | | | | | | | | | | | | | |
| CREPIPATELLA LINGULATA | X | | | | | | | | | | | | 4 | | | | | | | X |
| CYPRAEA SPADICEA | 2 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | | 1 | X |
| DIODORA SP. | | X | | X | X | | | | | | | | | | | | | | | |
| DIODORA ARNOLDI | X | | | | | | | | | | | | | | | | | | | |
| FUSINUS KOBELTI | | | X | | | | | | | | | | | | | | | | | |
| FUSINUS LUTEOPICTUS | | | | | | X | | | | | | | | | | | | | | |
| HALIOTIS CORRUGATA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1/J1 | 0 | 0 | 0 | 1 | 2 | 1 | 2 |
| HALIOTIS CRACHERODII | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HALIOTIS FULGENS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HALIOTIS RUFESCENS | 3/J2 | 0 | 1/J1 | 1/J1 | 0/J1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HALIOTIS SORENSENI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HALIOTIS WALALLENSIS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HALIOTIS ASSIMILIS | 0 | 0 | 0 | 0 | 0 | X | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIPPONIX SP. | | | | | | | | 0 | 0 | | | | | | | | | | | |
| HOMALOPOMA SP. | | | X | | X | X | | | | X | | | | | | | | | | |
| KELLETIA KELLETII | 3 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2/J1 | 2 | 1 | X | 1 | 1 | 1 | 2 | 1 | 2/e | 2 |
| LAMELLARIA SP. | | | | | | X | | | | | | | | | | | | | | |
| MAXWELLIA GEMMA | | | X | | | | | | | | X | X | | | X | | | | | X |
| MEGATHURA CRENULATA | 1 | 2 | 2 | 2 | 3/0 | 1/J1 | 3 | 1 | 2 | 2/J2 | 3/J2 | 1 | 1/X | 2 | 1 | 1 | 1 | 0 | 2 | 2 |
| MITRA IDAE | X | | X | | X | X | | | | | | | | | | | X | | | |
| NORRISIA NORRISI | 2 | X | | | | | | | | | | X | | | | | 2 | 2 | 2 | 2 |
| OLIVELLA SP. | | | | | | | | | X | | | | | | | | | | | |
| POLINICES SP. | | | | | | | | | | | | | | | | | | | e | |
| SERPULORBIS SQUAMIGERUS | 1 | 2 | 2 | 1 | 1 | 0 | 1 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 3 | 4 |
| TEGULA SP. | | | | | | | X | 2 | 2 | X | | 2 | | | | | | | | |
| TEGULA EISENI | | | | | | | | | | | 2 | 2 | 2 | X | 2 | 2 | 2 | 2 | 2 | 2 |
| TEGULA REGINA | 0 | 0 | 0 | 0 | | 2/J2 | X | X | X | 2 | 2/J2 | 2 | X | 2 | 1 | 1 | 1 | | | 1 |
| TRIVIA CALIFORNIANA | | | | | | | | | | | | | | | | | | | X | |
| TRIVIA SOLANDRI | | | X | | 2 | X | | | | | | X | X | | | | | | | X |
| VOLVARINA TAENIOLATA | | | | | | X | | | | | | X | X | | | | | | | |
| OPISTOBRANCHIA | | | | | | | | | | | | | | | | | | | | |
| APLYSIA CALIFORNICA | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 0 | 0 | 0 | 0 |
| APLYSIA VACCARIA | | | | | | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| BERTHELLINA ENGELI | | | | | | | | | | | X | X | X | | | | | | | |
| NAVANAX INERMIS | | | | | | | | | | | | 2 | | | | | | | | |
| HAMINOEA VIRESCENS EGGS | | | | | | | | | | | | | | | X | X | | | | |
| NUDIBRANCHIA | | | | | | | | | | | | | | | | | | | | |
| ANISODORIS NOBILIS | X | X | | | | | | | | | | | | | | | | | | |
| CADLINA LUTEOMARGINATA | X | | | | | | | | | | | | | | | | | | | |
| CORYPHELLA TRILINEATA | X | | | | | | | | | | | | | | | | | | | |
| DIAULULA SANDIEGENSIS | X | | | | X | X | | | | | 2 | | | | | | | | | |
| DORIOPSILLA ALBOPUNCTATA | X | X | | | | X | | | | X | | | X | | | | | | | |
| FLABELLINOPSIS IODINEA | | | | | | X | 2 | X | X | | 2 | X | | 1 | 2 | 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 |
| (=Coryphella iodinea) | | | | | | | | | | | | | | | | | | | | |
| HERMISSENDA CRASSICORNIS | X | X | X | | | X | X | | | X | | | | | | | X | | X | X |
| MEXICHROMIS PORTERAE | | | | | | X | | | X | | | | X | | | | | | | |
| PHIDIANA PUGNAX | | | | | X | | | | | | | | | | | | | | | |
| TRIOPHA CATALINAE | X | X | | | X | X | | | | | | | X | | | | | | | |
| TRIOPHA MACULATA | | | X | X | | X | | | | | | | | | | | | | | |
| TRITONIA FESTIVA | | | X | X | | | | | | X | | | | | | | | | | |
| PULM0NATA | | | | | | | | | | | | | | | | | | | | |
| POLYPLACOPHORA | | | | | | | | | | X | X | | X | | | | | | | |
| CRYPTOCHITON STELLERI | 2 | | | | | | | | | | | | | | | | | | | |
| TONICELLA LINEATA | 2 | X | X | X | X | | | | | | | | | | | | | | | |
| BIVALVIA | | | | | | | | | | | | | | | | | | | | |
| CHAMA ARCANA | | | | | | X | 2 | | X | | 2 | 2 | X | | X | | | X | | |
| DIPLODONTA ORBELLUS | X | | | | | X | | | | | | | | | | | | | | s |
| GARI CALIFORNICA | | | | | | | | | s | s | | | | | | | | | | |
| CRASSEDOMA GIGANTEUM (=Hinnites giganteus) | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 2/J1 | 2/J1 | 3 | 1 | 2 | 1 | 1 | 1 | 0 | 0 |
| LIMA HEMPHILLI | s | | | s | s | s | | s | X | s | X | X | s | | | s | | | | |
| PHOLAD | X | | X | 2 | X | | X | | | X | | | | | | | | | | |
| PODODESMUS CEPIO | 3 | X | 2 | 2 | X | X | X | X | X | 2 | X | X | X | | | | | | | |
| PTERIA STERNA | | | | | | | | | | | 1 | | | 1 | | | | | | |
| SEMELE SP. | | | | | | | | X | | X | | | | | | | | | | |
| TRACHYCARDIUM QUADRAGENARIUM | s | | | | | | | | | | | | | | | | | | | |
| VENTRICOLARIA FORDII | | | | | X | | | | | | | | | | | | | | | |
| CEPHALAPODA | | | | | | | | | | | | | | | | | | | | |
| OCTOPUS SP. | X | | X | X | X | 2 | | | X | | | | | | | | | | | |
| OCTOPUS BIMACULATUS/BIMACULOIDES | | | | | | | | X | | | 0 | X | X | | X | | X | X | | X |
| ECTOPROCTA | | | | | | | | | | | | | | | | | | | | |
| AETEA SP. | | | | | | | | | | | | | X | | | | | | | X |
| ANTROPORA TINCTA | | | | | | X | | | | | | | | | | | | | | |
| BUGULA CALIFORNICA | | 1 | X | X | | | 3 | 3 | X | X | X | X | X | 2 | 3 | 2 | | | | |
| BUGULA NERITINA | 1 | 1 | X | X | X | X | X | | | X | X | X | X | | X | X | X | X | | 1 |
| COSTAZIA ROBERTSONIAE | X | | 1 | 2 | X | 2 | X | | | X | | | | X | | X | | | | |
| CRISIA SP. | X | | | | | | | | | | | | | | | | | | | |
| DIAPEROECIA CALIFORNICA | 2 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 | 0 | 2 |
| EURYSTOMELLA BILABIATA | | | | | | | | | | | | | X | | | | | | | X |
| FLUSTRELLIDRA SP. | X | | | | | | | | | | | | | | | | | | | |
| HIPPODIPLOSIA INSCULPTA | X | 2 | 4 | 2 | | 2 | X | | | | | | X | | | | | | | |
| LICHENOPORA NOVAE-ZELANDIAE | | | X | | | 3 | X | 1 | 1 | | | | | 2 | X | X | | | | |
| MEMBRANIPORA SP. | 2 | 2 | 4 | 2 | X | 3 | 3 | 1 | 1 | X | 2 | X | X | 3 | 2 | 2 | X | X | X | X |
| MEMBRANIPORA MEMBRANACEA | | | | | | | | | | | | | X | | | | | | | X |
| MEMBRANIPORA | | | | | | | | | | | | | X | | | | | | | |

| 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 |
| **TUBERCULATA** | | | | | | | | | | | | | | | | | | | | |
| **PARASMITTINA/RHYNCHOZOON** | | | | | | | | | | | | | X | | | | | | | X |
| **PHIDOLOPORA SP.** | | | | | | | | | | | | | | | | | | | | X |
| **PHIDOLOPORA PACIFICA** | | | X | X | | 3 | | | | | 2 | | | | | | | | | |
| **THALAMOPORELLA CALIFORNICA** | | | X | X | | X | | X | | | | X | X | | | | | | | X |
| ENTOPROCTA | | | | | | | | | | | | | | | | | | | | |
| PHORONIDA | | | | | | | | | | | | | | | | | | | | |
| **PHORONIS VANCOUVERENSIS** | | | | | | | | 2 | X | | | | | | | | | | | |
| BRACHIOPODA | | | | | | | | | | | | | | | | | | | | |
| ECHINODERMATA | | | | | | | | | | | | | | | | | | | | |
| ASTEROIDEA | | | | | | | | | | | | | | | | | | | | |
| **DERMASTERIAS IMBRICATA** | 2 | 2 | | 2 | 1 | | | | | 1 | | | | | | | | | | |
| **HENRICIA SP.** | | | | | | | | X | X | X | | | | | | | | | 1 | |
| **HENRICIA LEVIUSCULA** | 2 | X | | | 2 | 2 | 2 | | | | 2 | | | | | | | | | |
| **LINCKIA COLUMBIAE** | 0 | 0 | 0 | 0 | 0 | | | 2 | 2 | | 3 | X | X | | X | | 4 | 2 | 2 | 2 |
| **MEDIASTER AEQUALIS** | 0 | 0 | 0 | 0 | 0 | 2 | | | | | | | | | | | | | | |
| **ORTHASTERIAS KOEHLERI** | X | X | 1 | 1 | X | | | | | | | | | X | | | 1 | | | |
| **ASTERINA MINIATA (=Patiria miniata)** | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 0 |
| **PISASTER BREVISPINUS** | | | 1 | | 2 | | 1 | | | | | | | | | | 0 | 0 | 0 | 0 |
| **PISASTER GIGANTEUS** | 2/J3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 |
| **PISASTER OCHRACEUS** | | | | | | | | | | | | | | | | | 1 | | 0 | |
| **PYCNOPODIA HELIANTHOIDES** | 2 | 3 | 3 | 3 | 3/J3 | 3 | 3 | 0 | 1 | 3 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| **diseased seastars** | 0 | | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | |
| ECHINOIDEA | | | | | | | | | | | | | | | | | | | | |
| **ARBACIA INCISA** | | | | | | | | | | | 1 | | | | | | | | | |
| **CENTROSTEPHANUS CORONATUS** | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 2 | 1/J1 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 2 | 1 | 2 |
| **LYTECHINUS ANAMESUS** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **LYTECHINUS ANAMESUS JUVENILES** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **STRONGYLOCENTROTUS FRANCISCANUS** | 3 | 4 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | 2 |
| **S. FRANCISCANUS JUV.** | 1 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 2 | 2 | 3 | 3 | 0 | 0 | 0 | 0 |
| **STRONGYLOCENTROTUS PURPURATUS** | 1 | 1 | 1 | 1 | 0 | 1 | 2 | 4 | 4 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 |
| **S. PURPURATUS JUV.** | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 0 | 0 | 0 |
| **diseased urchins** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OPHIUROIDEA | | | | | | | | | | | | | | | | | | | | |
| **OPHIODERMA PANAMENSE** | | | | | | X | | | | X | X | X | X | | | | | | | |
| **OPHIOPLOCUS ESMARKI** | X | | X | X | | X | | | | X | | X | X | | | | | | | X |
| **OPHIOPSILLA CALIFORNICA** | | | | | | | | | X | | | | | | | | | | | |
| **OPHIOPTERIS PAPILLOSA** | | | X | X | 2 | X | X | | | X | X | X | X | | | | | | X | X |

| 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 |
| **OPHIOTHRIX SPICULATA** | | | | | 1 | | 2 | | | 2 | 4 | | | | | | | | | |
| HOLOTHUROIDEA | | | | | | | | | | | | | | | | | | | | |
| **CUCUMARIA SP.** | | | 2 | 2 | 2 | X | | | | | | | | | | | | | | |
| **CUCUMARIA MINIATA** | X | | | | | | | | | | | | X | | | | | | | |
| **CUCUMARIA PIPERATA** | X | X | | | 2 | X | 3 | 2 | 2 | X | 2 | X | X | X | X | X | | | | |
| **CUCUMARIA SALMA** | | | | | | | X | | | | X | X | 3 | | | | | | | 1 |
| **EUPENTACTA QUINQUESEMITA** | X | | | | | | | | | | | | | | | | | | | |
| **PACHYTHYONE RUBRA** | | | 0 | 0 | | 1 | | 0 | 0 | | 0 | 0 | | | | | | | | |
| **PARASTICHOPUS CALIFORNICUS** | 1 | 1 | | | 0 | 1 | 0 | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **PARASTICHOPUS PARVIMENSIS** | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0/J2 | 2 | 2/J2 | 2 | 2 | 2 | 1 | 2 | 2 | 3 |
| CHORDATA | | | | | | | | | | | | | | | | | | | | |
| UROCHORDATA (TUNICATA) | 3 | 1 | | | | | | | | | | | | | | | 3 | 2 | 2 | 3 |
| **APLIDIUM SP.** | | | 4 | | X | | 2 | X | X | | | 2 | X | X | 3 | 2 | 2 | | | 3 |
| **ARCHIDISTOMA SP.** | | | | | | X | | | | | | | | | | | | | | |
| **BOLTENIA VILLOSA** | X | 1 | | | 2 | | | | | | | | | | | | | | | |
| **BOTRYLLUS/BOTRYLLOIDES** | X | | | | | | | | | | | | | | | | | | | |
| **CLAVELINA HUNTSMANI** | X | 1 | 1 | | | | | | | | | X | | 1 | 1 | 1 | 2 | | | 1 |
| **CNEMIDOCARPA FINMARKIENSIS** | | | | | | | | | | | | | | | | | | | | |
| **CYSTODYTES LOBATUS** | X | 1 | 2 | 2 | 2 | X | | 1 | | | | | | | | | | | | |
| **DIDEMNUM SP.** | | | | | | | | | | | | | | X | X | X | | | | 3 |
| **DIDEMNUM/TRIDIDEMNUM** | X | | | | X | X | | | | | X | X | X | | | | 2 | | 2 | |
| **DISTAPLIA OCCIDENTALIS** | | X | | X | | | | | | | X | | | | X | X | X | | | |
| **EUHERDMANIA CLAVIFORMIS** | | | | | | | | | | | | | | | | | | | | X |
| **HALOCYNTHIA HILGENDORFI IGABOJA** | | | | | | X | | | | | | | | | | | | | | |
| **METANDROCARPA TAYLORI** | | | | | X | | | | | | | | X | | | | X | | X | 3 |
| **PEROPHORA ANNECTENS** | | | | | | | | | | | | | X | | | | | | | |
| **POLYCLINUM PLANUM** | X | | 4 | 2 | | | | | | | | | | | | | | | | |
| **PYCNOCLAVELLA STANLEYI** | | | 2 | 2 | | | | | | | | X | | 3 | 2 | 2 | | | | |
| **PYURA HAUSTOR** | | | X | 2 | 2 | | | | | | | | | | X | | | | | X |
| **PYURA MIRABILIS** | | | | | | | | | | | | | X | | | | | | | |
| **STYELA MONTEREYENSIS** | X | 0 | 3/J3 | 2/J1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| **TRIDIDEMNUM OPACUM** | | | | | | | | | | | | | | X | X | | | | | |
| SALPS | | | | | | | | | | | | | | | | | | | | |
| **THETYS VAGINA** | | | | | | | | | | | X | | | | | | | | | |
| VERTEBRATA | | | | | | | | | | | | | | | | | | | | |
| CHONDRICHTYES | | | | | | | | | | | | | | | | | | | | |
| **CEPHALOSCYLLIUM VENTRIOSUM** | | | X | X | | 1 | X | | | | | | | | | | | | | |
| **HETERODONTUS FRANCISCI** | | | | | | | | | X | | | | X | | | | 1 | | | X |
| **MYLIOBATIS CALIFORNICA** | | | | X | | | | X | X | | | | | X | | X | 1 | 1 | 1 | |
| **SQUATINA CALIFORNICA** | | | | | | | 1 | | | | | | | | | | | | | |
| **TRIAKIS SEMIFASCIATA** | | | | | | | | | | | | | | | | | | X | | |

| 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 |
| OSTEICHTHYES | | | | | | | | | | | | | | | | | | | | |
| GYMNOTHORAX MORDAX | | | | | | | | 1 | | | | | | | | | | | | |
| GOBIESOX SP. | | | | | | | | X | | | | | | | | | | | | |
| SARDINOPS SAGAX | | | | | | | | | | | | | | | | | | | | X |
| ATHERINOPS AFFINIS | | X | | | X | X | X | | X | X | | X | X | X | | X | | X | | |
| AULORHYNCHUS FLAVIDUS | 4 | 2 | | | | | | | | | | | | 3 | | | | | | |
| SYNGNATHUS CALIFORNIENSIS | | | X | | | X | | | | | | | | | | | | | | |
| AGONIDAE | | | | | | | | | | | | | | | | | | | | |
| RATHBUNELLA HYPOPLECTA | | X | | | 2 | | X | | | | | | | | | | | | | |
| LIPARIS PULCHELLINI | | | | | | X | | | | | | | | | | | | | | |
| TRACHURUS SYMMETRICUS | X | | | X | | X | | | | X | | | | | | | | | | X |
| ALLOCLINUS HOLDERI | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 4 | 2 | 1 | 1 | 1 |
| GIBBONSIA SP. | | X | X | | | X | X | | | | X | X | X | X | X | | X | X | | 1 |
| GIBBONSIA ELEGANS | X | X | | | | | | | | | | | X | | | | | | | |
| HETEROSTICHUS ROSTRATUS | 1 | | | | X | | | | | | | | X | X | X | | | | | |
| H. ROSTRATUS (JUVENILES) | | X | | | | | | | | | | X | X | 1 | | X | | X | X | X |
| NEOCLINUS SP. | | | | | | | | X | X | X | | | | | | X | | | | |
| NEOCLINUS STEPHANSAE | X | | | | | | | | | | | | | | | | | | | |
| COTTIDAE | | | | | | | | | | | | | | | | | | | | |
| ARTEDIUS CORALLINUS | | X | X | X | X | X | X | | X | X | X | | | X | X | | | | | |
| ORTHONOPIAS TRIACIS | X | X | X | X | 2 | X | X | | X | | | X | | 2 | 2 | 2 | 1 | | | |
| SCORPAENODES XYRIS | | | | | | | | | | | | 2 | | | | | 1 | | | |
| SCORPAENICHTHYS MARMORATUS | X | X | 1 | X | 1 | 2 | X | 1 | | X | 2 | X | 2 | 1 | 1 | | | | 1 | |
| BRACHYISTIUS FRENATUS | | | 3 | 1 | 2 | 2 | | | | 2 | | 3 | 4 | x | | | 2 | 2 | 2 | X |
| RHACOCHILUS VACCA | 2/J2 | 2/J2 | 2 | 2/J2 | 2/J2 | 1/J1 | 2 | 2 | 2 | 2 | 1/J0 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | |
| EMBIOTOCA JACKSONI | 2 | 2 | 4/J2 | 4/J2 | 2/J2 | 2/J2 | 1 | 3 | 3 | 2 | 1/J0 | 2 | 2 | | | | 1 | 2 | 2 | 2 |
| EMBIOTOCA LATERALIS | 2/J2 | 2/J2 | 4/J2 | 4/J2 | 2/J1 | 2/J1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | | 0 | 0 | 0 | 0 |
| HYPSURUS CARYI | 2 | 2 | 3 | 2 | 1 | 1 | | | | 1 | | | | | | | | | | 1 |
| PHANERODON FURCATUS | | | | | | | | | | | | | | | | | | 1 | | |
| RHACOCHILUS TOXOTES | | X | X | 2 | X | X | X | 2 | | | X | | X | | | | 0 | 0 | 0 | 1 |
| CORYPHOPTERUS NICHOLSI | 2 | 4 | 2 | 2 | 2 | 2 | 3 | 4 | 3 | 2 | 3 | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 1 | 1 |
| LYTHRYPNUS DALLI | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 2 |
| LYTHRYPNUS ZEBRA | | | | | | 0 | | 1 | | | 0 | | 2 | | | | | 1 | | |
| OPHIODON ELONGATUS | 3 | 2 | 2 | 2 | | 2 | 2 | | | 1 | | | | | | | | | | |
| OXYLEBIUS PICTUS | 3 | 2 | 3 | 2 | 3 | 3/J2 | 3 | 2 | 2 | 2 | 3/J2 | 2 | 3 | 3 | 3 | 2 | 1 | 0 | 1 | 1 |
| GIRELLA NIGRICANS | 1 | 0 | 2 | 2 | 0 | 1 | 2 | 2 | 2 | 0 | 2 | 2 | 3 | 1 | 3 | 3 | 0 | 1 | 0 | |
| MEDIALUNA CALIFORNIENSIS | | | 2 | X | X | | X | X | X | | X | X | 2 | X | X | X | 0 | 1 | 1 | 0 |
| HALICHOERES SEMICINCTUS | | | 1 | 0 | 0 | 0 | | | | | 2 | | 2 | | | | 1 | 2 | 1 | 2 |
| H. SEMICINCTUS (FEMALES) | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| H. SEMICINCTUS (MALES) | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 0 | 0 | 1 | 0 | 2 | 1 | 2 |
| H. SEMICINCTUS (JUVENILES) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 |
| OXYJULIS CALIFORNICA | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

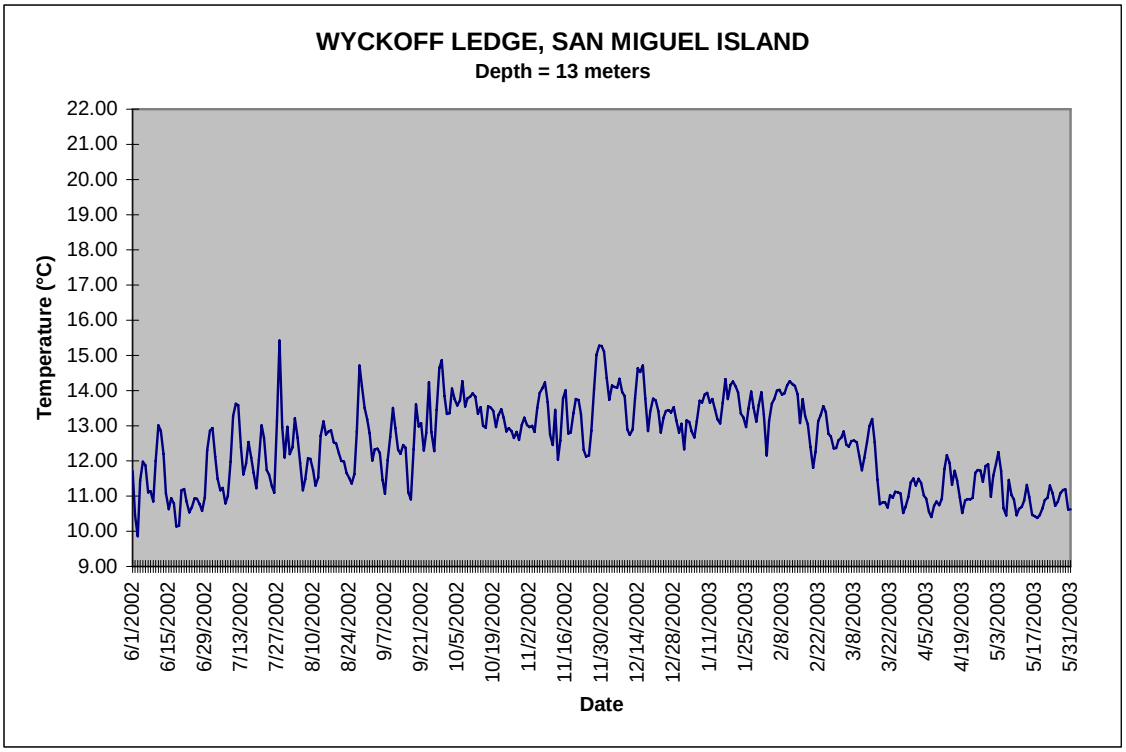
| LOCATION: | SMWL | SMHR | SRJLNO | SRJLSO | SRRR | SCGI | SCFH | SCPB | SCSA | SCYB | ANAR | ANCC | ANLC | SBSESL | SBAP | SBCAT | CLNWH | CLBSC | CLEP | CLHBC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPECIES: SITE #: | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| O. CALIFORNICA (JUVENILES) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| SEMICOSSYPHUS PULCHER | | | | | 2 | | | | 1 | | | | 2 | | | | 3 | 2 | 3 | 3 |
| S. PULCHER (FEMALES) | 1 | 2 | 4 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 3 | 2 |
| S. PULCHER (MALES) | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 1 | 1 | 2 | 2 | 3 | 3 |
| S. PULCHER (JUVENILES) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 |
| CAULOLATILUS PRINCEPS | | | X | X | | X | X | 2 | 1 | X | X | X | | X | X | X | 1 | 2 | 1 | 0 |
| STEREOLEPIS GIGAS | | | | | | | | | | | | | | | | | 0 | 1 | 0 | 0 |
| CHROMIS PUNCTIPINNIS | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 4 | 3 | 4 | 2 | 3 | 3 | 2 | 2 | 2 | 2 |
| CHROMIS PUNCTIPINNIS (JUVENILES) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| HYPSYPOPS RUBICUNDUS | 0 | 0 | 2 | 0 | 0 | 1 | 2 | 3 | 3 | 0 | 2 | 3 | 3 | 2 | 3 | 4 | 1 | 2 | 1 | 2 |
| HYPSOPOPS RUBICUNDUS (JUVENILES) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| SCORPAENA GUTTATA | | X | | | | X | X | 1 | 1 | X | X | X | 1 | | | | | X | | 2 |
| SEBASTES SP. (JUVS.) | X | X | X | X | 2 | X | X | X | X | X | X | X | X | X | X | X | | | | |
| SEBASTES ATROVIRENS | 2 | 2 | 3 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 0 | 2 | 2 | 0 | 0 | 1 | 1 | 2 | 1 | 1 |
| S. ATROVIRENS (JUVENILES) | 2 | 2 | 2 | 3 | 3 | 2 | 1 | 1 | 0 | 2 | 0 | 2 | X | 1 | 0 | 0 | | | | |
| SEBASTES CARNATUS | X | X | X | | X | X | X | | X | X | | | | | X | | 0 | 0 | 0 | |
| SEBASTES CAURINUS | X | | | | | | | | | | | | | | | | 0 | 0 | 0 | |
| S. CARNATUS/CAURINUS (JUVENILES) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | | | | | |
| SEBASTES CHRYSOMELAS | 2 | X | X | X | 1 | X | X | | 1 | X | 0 | | X | | | | 0 | 0 | 0 | |
| SEBASTES MELANOPS | | 2 | | | X | | 2 | | 1 | | | | | | | | | | | |
| SEBASTES MINIATUS | 1 | | | | | | | | | | | | | | | | 0 | | 0 | |
| S. MINIATUS (JUVENILES) | | | | | 1 | | | | | 1 | | | | | | | | | | |
| SEBASTES MYSTINUS | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | |
| S. MYSTINUS (JUVENILES) | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | | | | |
| S. PAUCISPINIS (JUVENILES) | 3 | 2 | 3 | | 2 | 2 | | | | 1 | | | 1 | | | | | | | |
| SEBASTES RASTRELLIGER | | | | | | | | | | | | | | | X | X | 0 | | 0 | |
| SEBASTES SERRANOIDES | 1 | 2 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 |
| S. SERRAN./S. FLAVIDUS (JUVENILES) | 2 | 2 | 3 | 2 | 3 | 2 | 1 | | 1 | 1 | 1 | 1 | X | 2 | | | 0 | 0 | 0 | |
| SEBASTES SERRICEPS | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | |
| S. SERRICEPS (JUVENILES) | 1 | 1 | 2 | 2 | 2 | 3 | 4 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | | 1 | | |
| PARALABRAX CLATHRATUS | 0 | 0 | 1 | 2 | 1 | 1 | 3 | 3 | 2 | 1 | 1 | 2 | 3 | 1 | 2 | 1 | 2 | 2 | 4 | 3 |
| P. CLATHRATUS (JUVENILES) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CITHARICHTHYS STIGMAEUS | X | | | | | | | | | | | | | X | | | | | | |
| PLEURONICHTHYS COENOSUS | | | X | | X | | | X | X | | | | | | | | | | | 1 |
| AVES | | | | | | | | | | | | | | | | | | | | |
| MAMMALIA | | | | | | | | | | | | | | | | | | | | |
| PHOCA VITULINA | X | | | | | | | | | | | | | | | | | | | |
| REPTILIA | | | | | | | | | | | | | | | | | | | | |

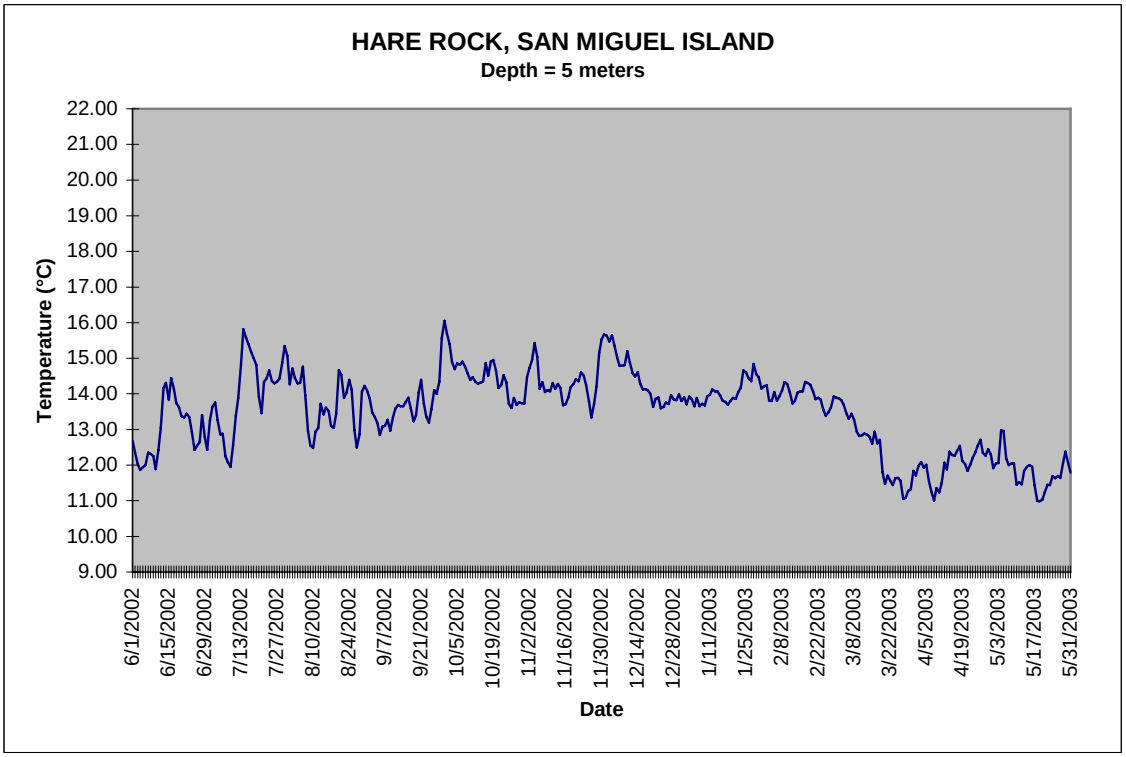
# Appendix L.

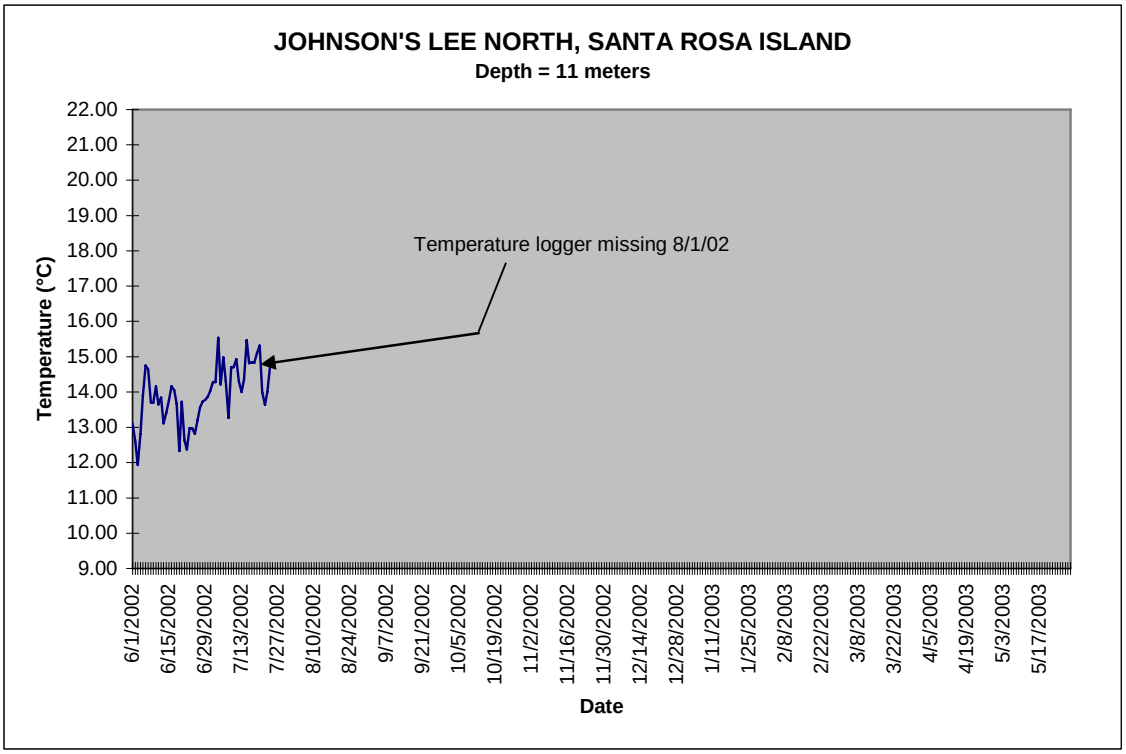
**2003 Temperature data collected at Channel Islands National Park Kelp Forest Monitoring Stations by remote temperature loggers.**

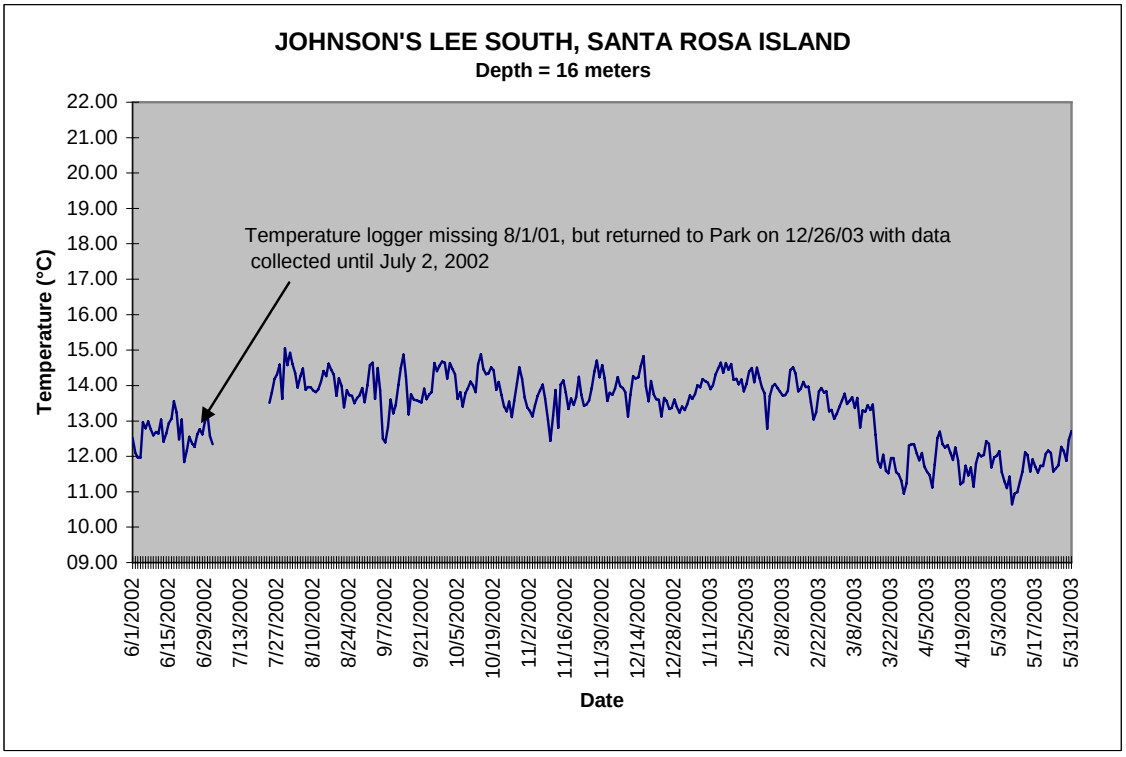
**Introduction:**

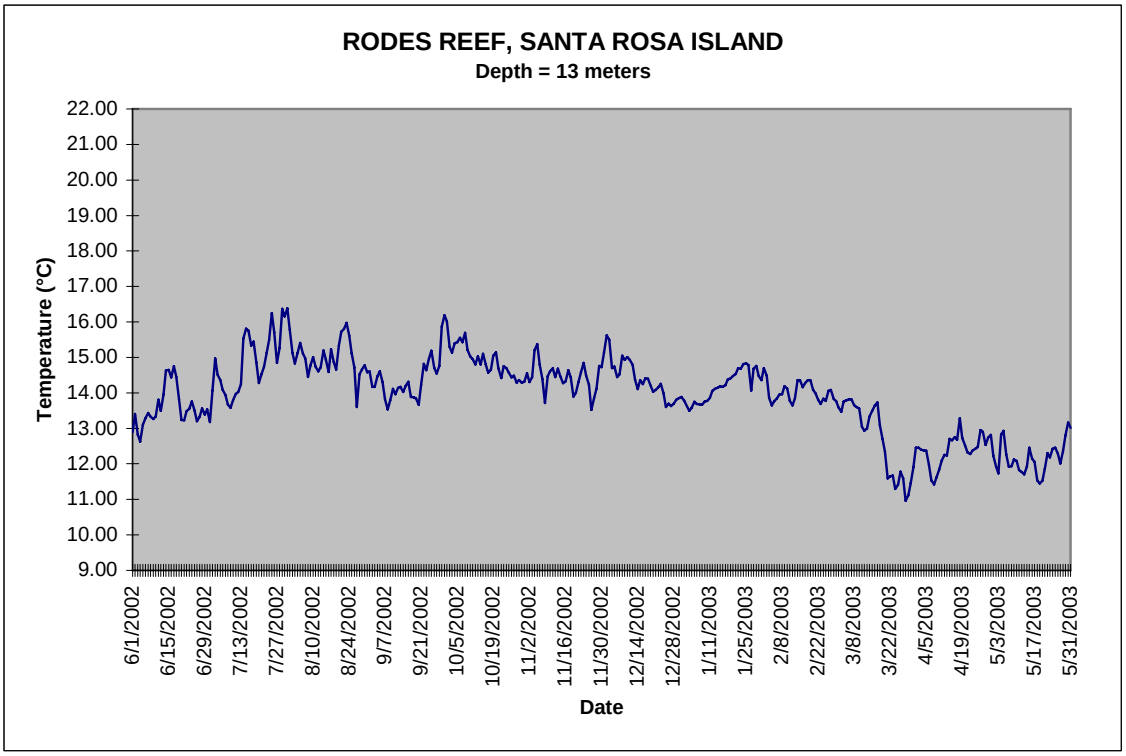
**This appendix contains the temperature data (presented graphically) collected by STOWAWAY$^{TM.}$ andTIDBIT$^{TM}$ temperature loggers that were deployed at 16 Kelp Forest Monitoring sites. Missing data at some sites is the result of technical problems or loss of temperature logger.**

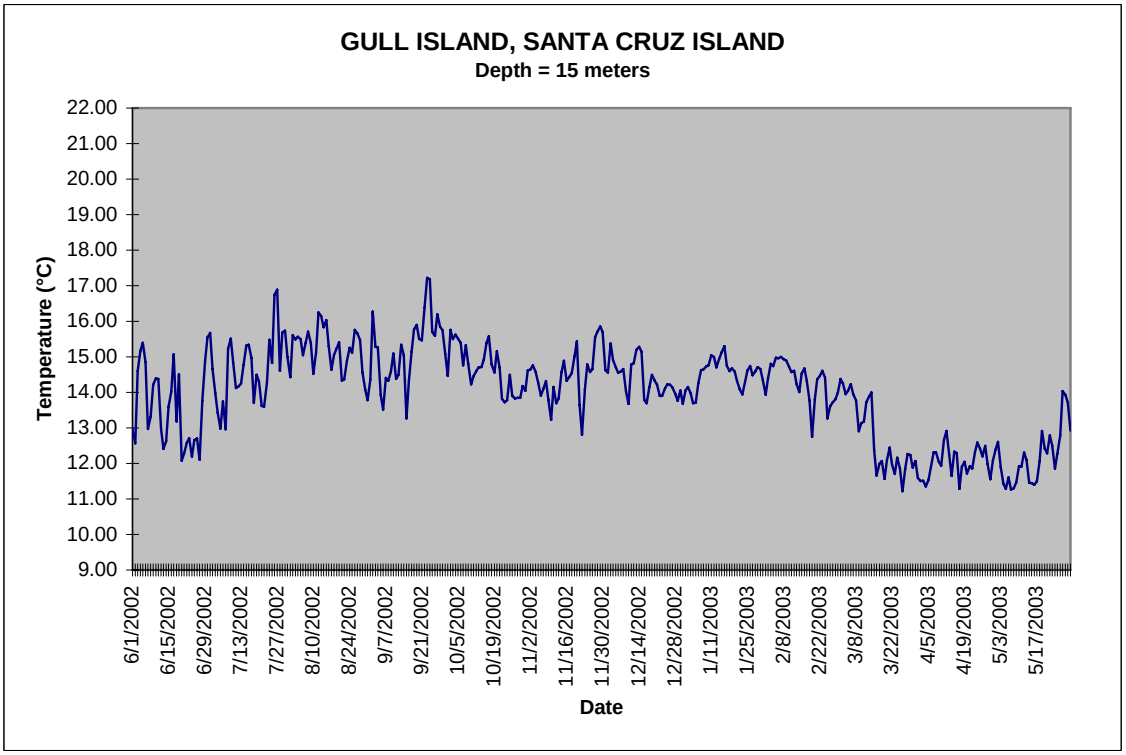

WYCKOFF LEDGE, SAN MIGUEL ISLAND
Depth = 13 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


HARE ROCK, SAN MIGUEL ISLAND
Depth = 5 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


JOHNSON'S LEE NORTH, SANTA ROSA ISLAND
Depth = 11 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
Temperature logger missing 8/1/02
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
Date


JOHNSON'S LEE SOUTH, SANTA ROSA ISLAND
Depth = 16 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
09.00
Temperature logger missing 8/1/01, but returned to Park on 12/26/03 with data collected until July 2, 2002
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


RODES REEF, SANTA ROSA ISLAND
Depth = 13 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


GULL ISLAND, SANTA CRUZ ISLAND
Depth = 15 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
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10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
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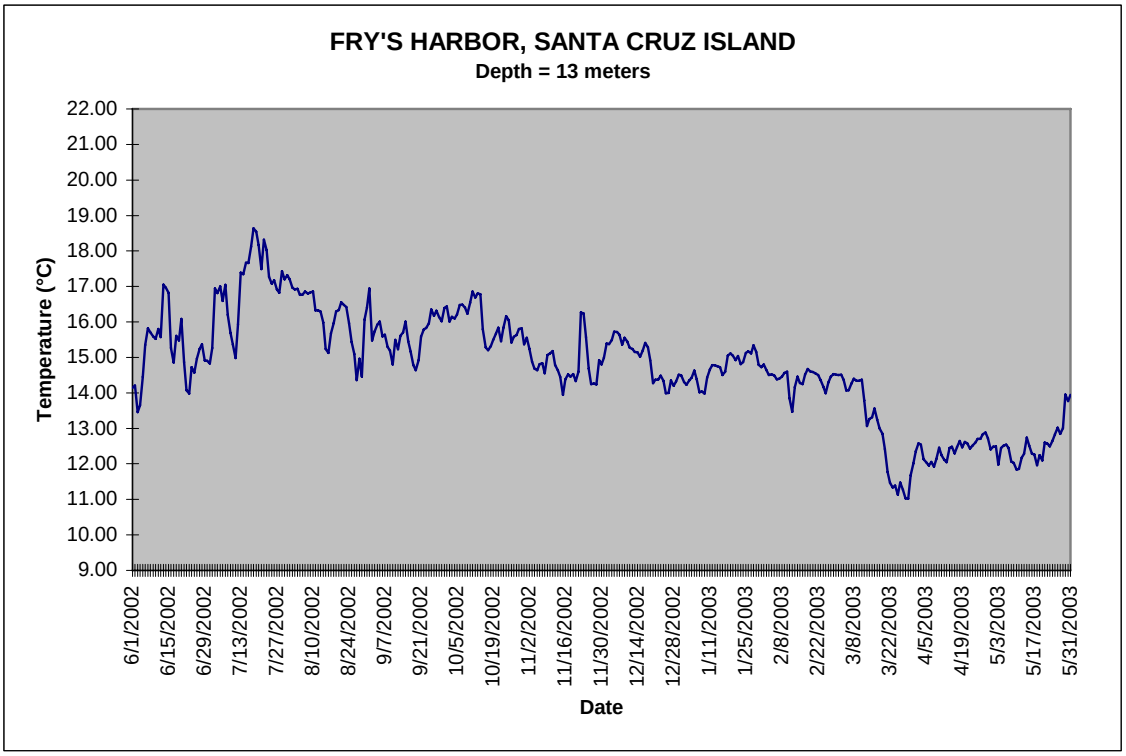
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
Date


FRY'S HARBOR, SANTA CRUZ ISLAND
Depth = 13 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
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12/14/2002
12/28/2002
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1/25/2003
2/8/2003
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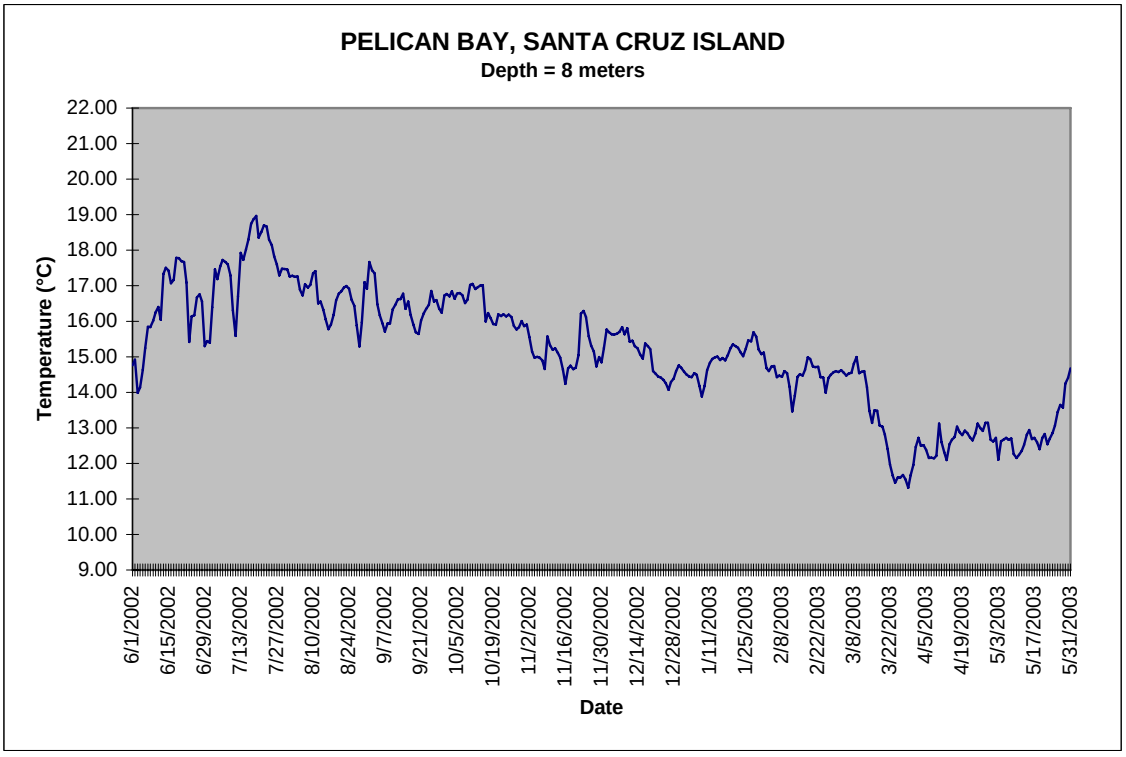
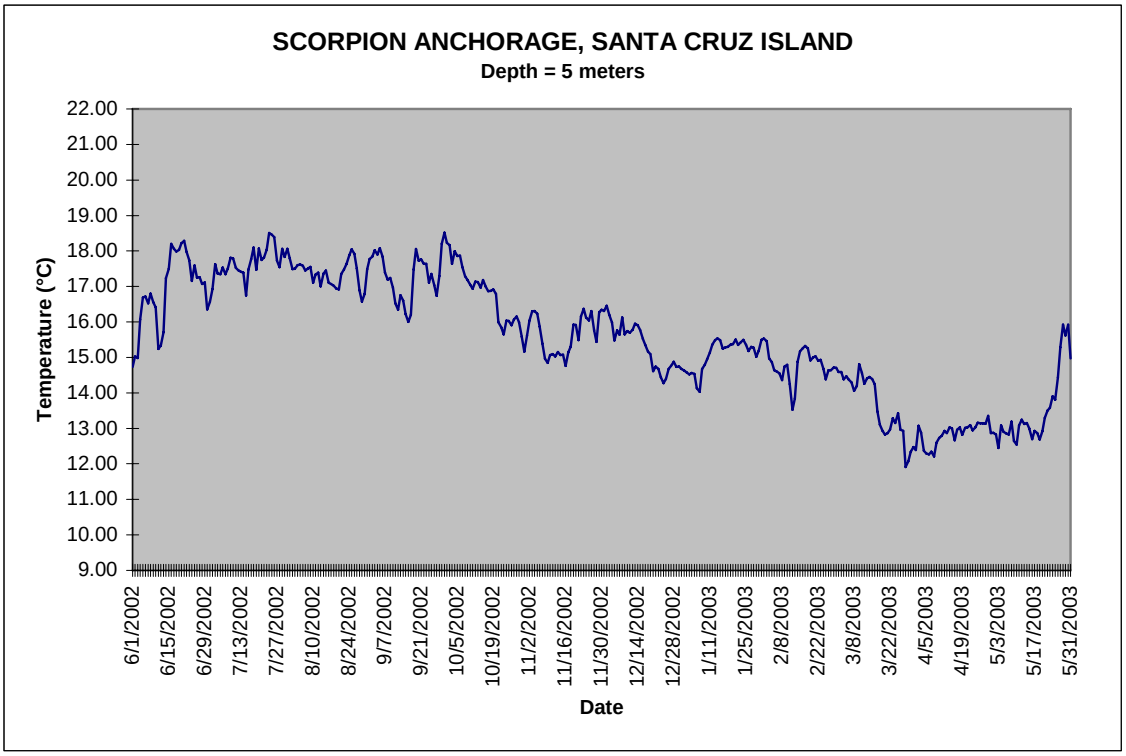
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


PELICAN BAY, SANTA CRUZ ISLAND
Depth = 8 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


SCORPION ANCHORAGE, SANTA CRUZ ISLAND
Depth = 5 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
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12/14/2002
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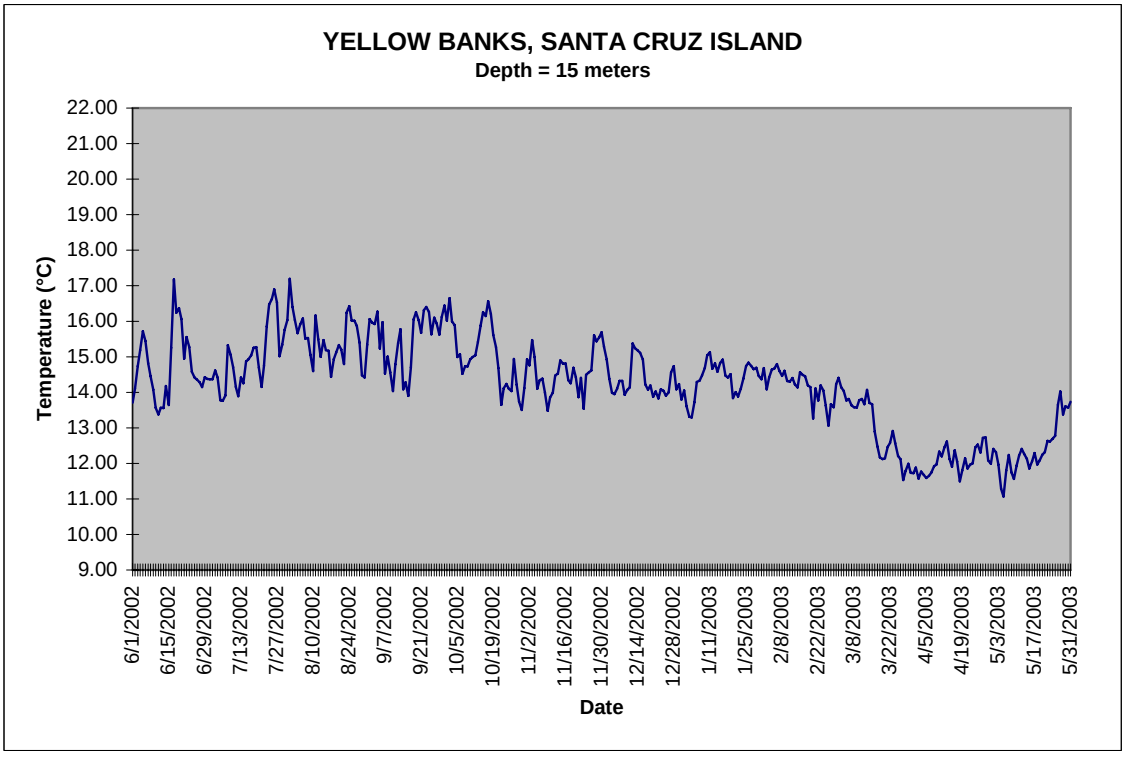
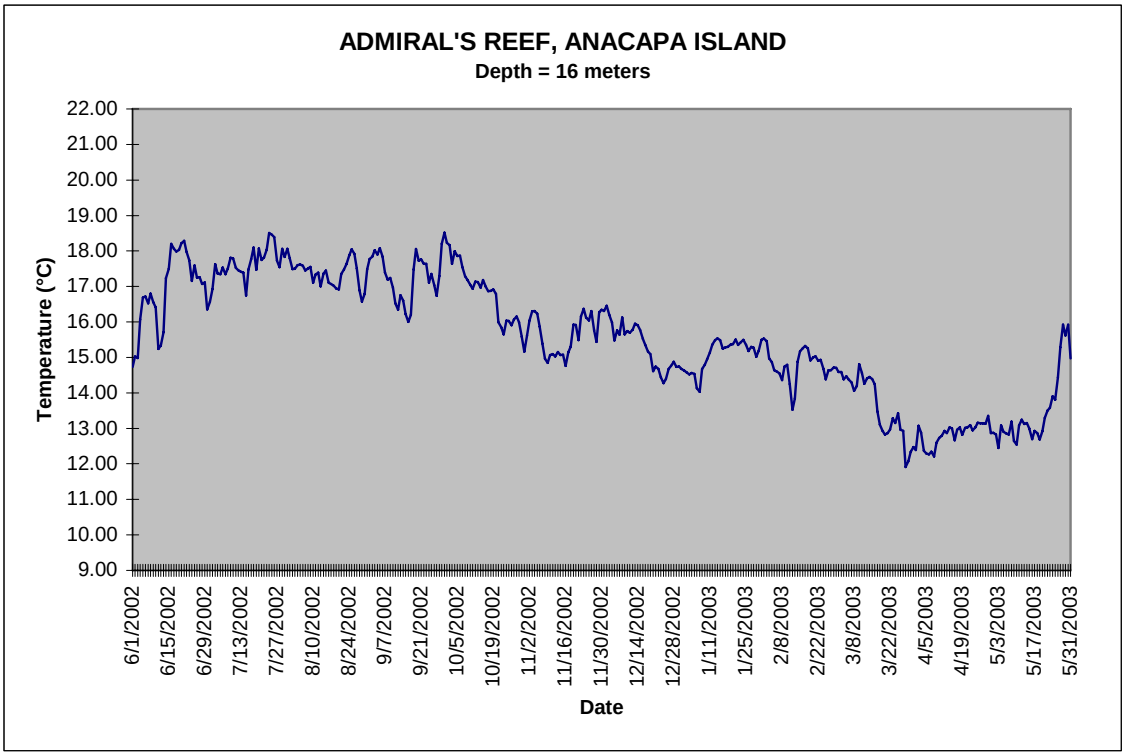
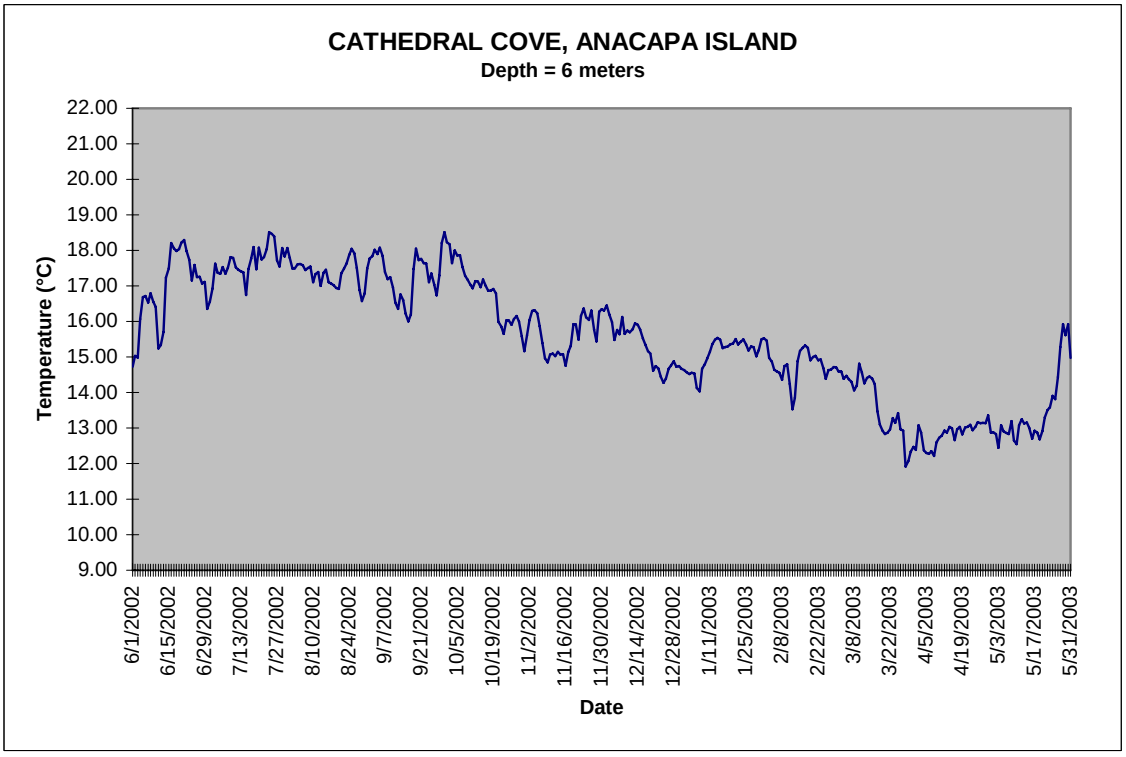
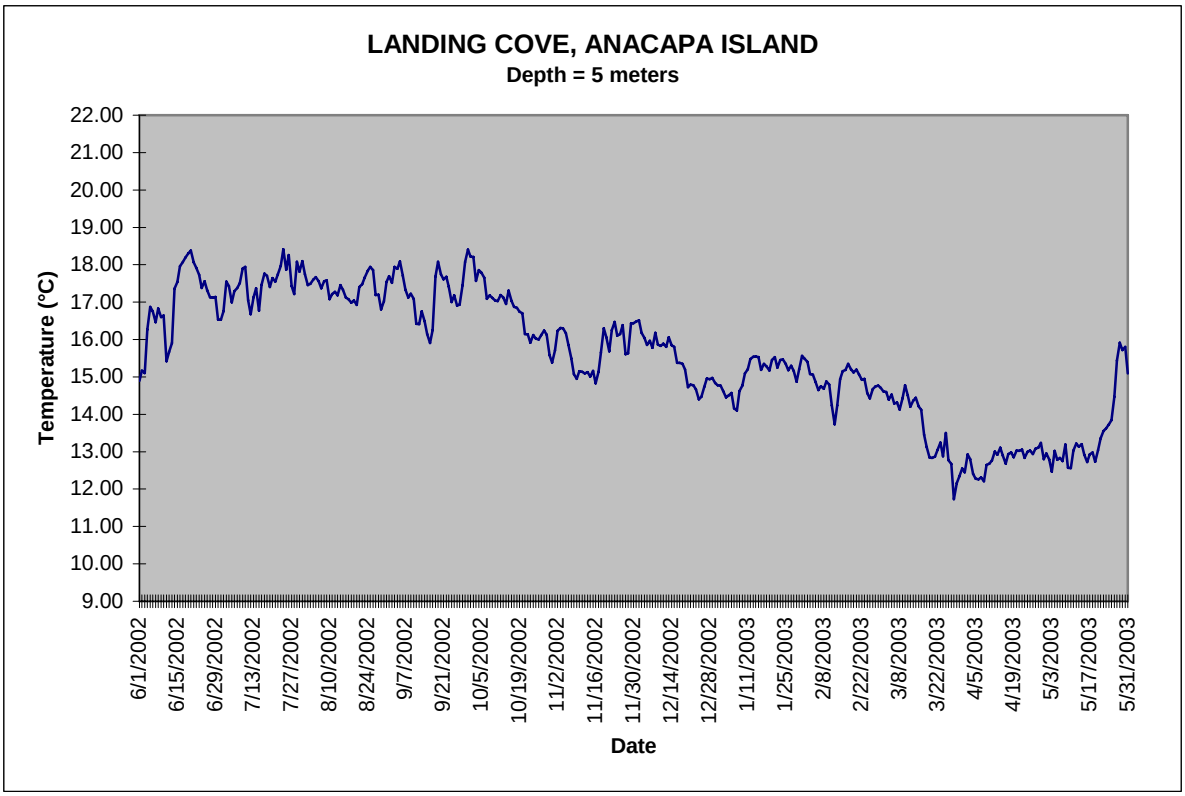
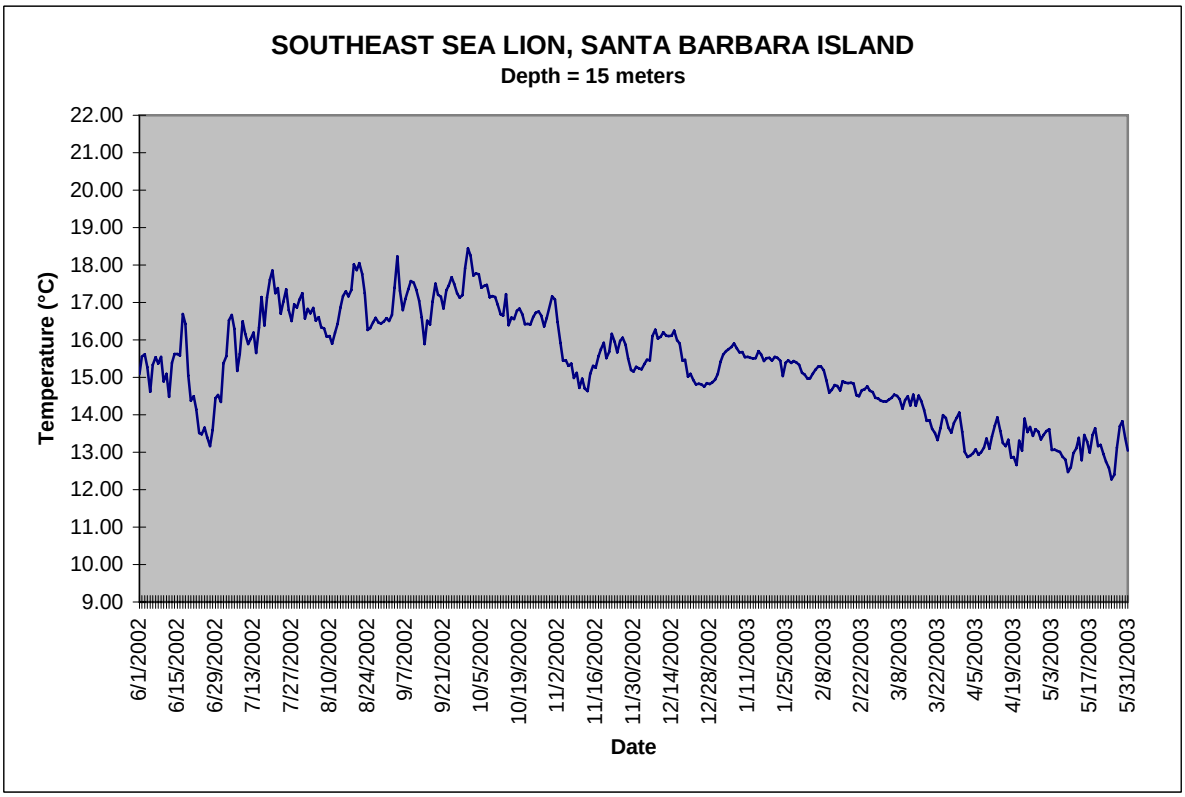
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date

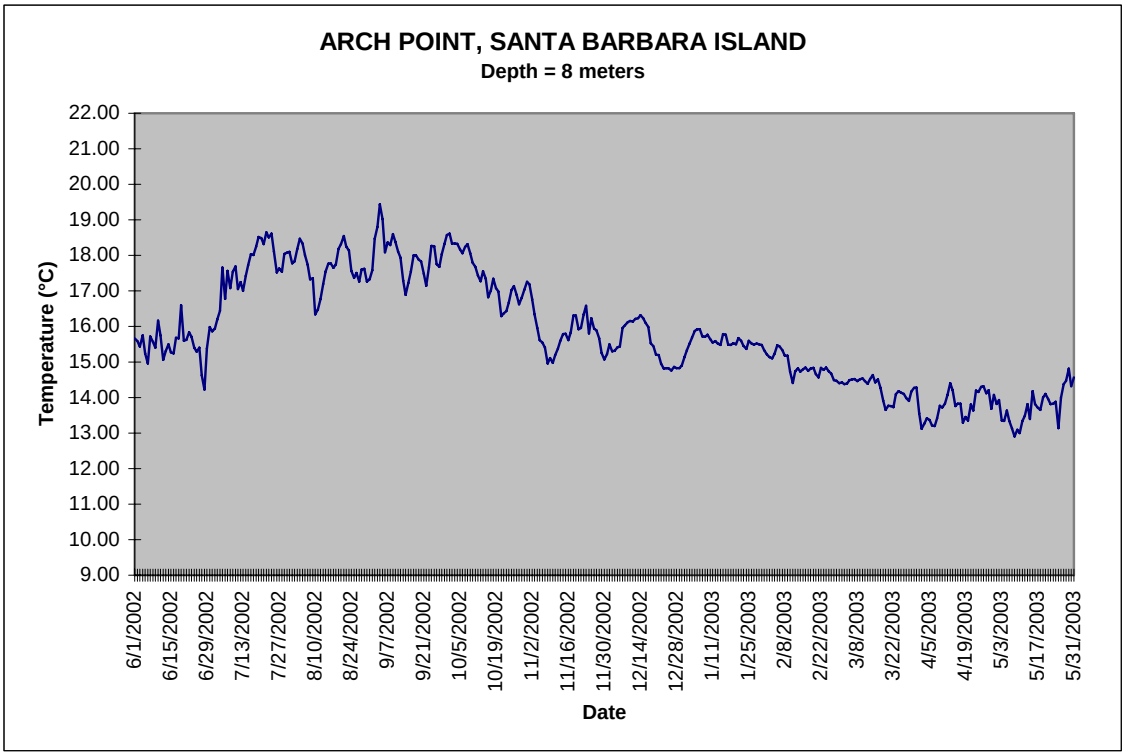

YELLOW BANKS, SANTA CRUZ ISLAND
Depth = 15 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


ADMIRAL'S REEF, ANACAPA ISLAND
Depth = 16 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


CATHEDRAL COVE, ANACAPA ISLAND
Depth = 6 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


LANDING COVE, ANACAPA ISLAND
Depth = 5 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


SOUTHEAST SEA LION, SANTA BARBARA ISLAND
Depth = 15 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


ARCH POINT, SANTA BARBARA ISLAND
Depth = 8 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
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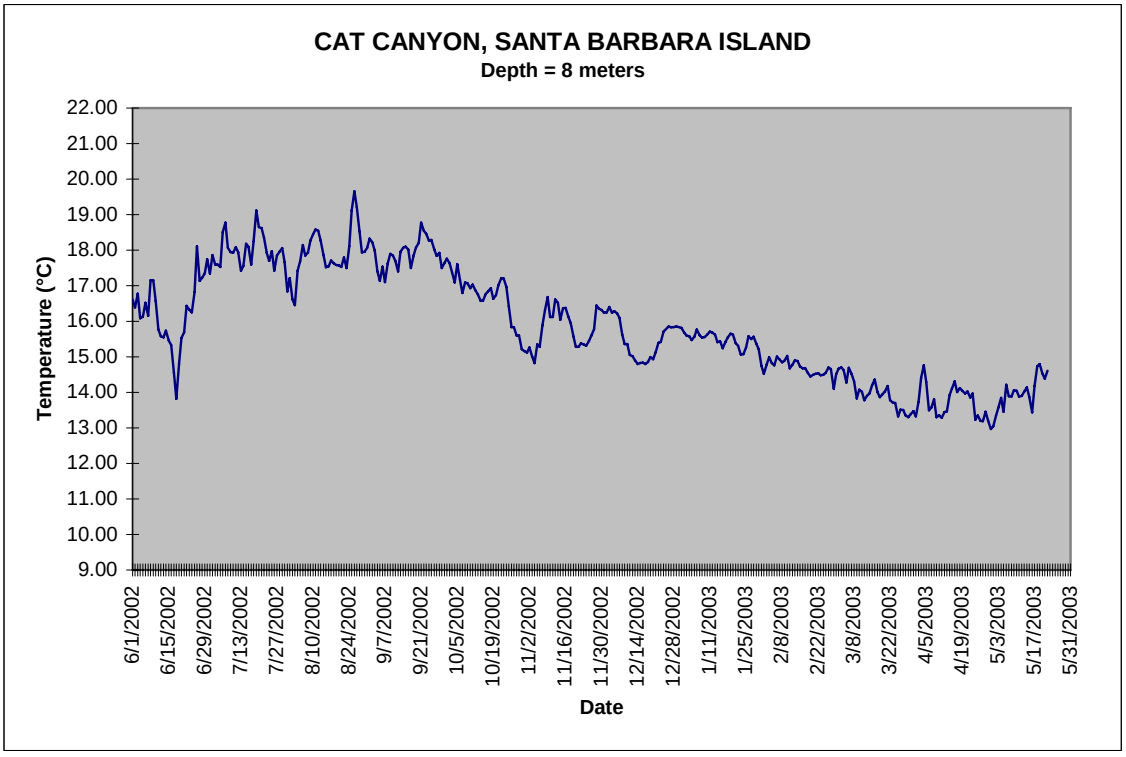
6/1/2002
6/15/2002
6/29/2002
7/13/2002
7/27/2002
8/10/2002
8/24/2002
9/7/2002
9/21/2002
10/5/2002
10/19/2002
11/2/2002
11/16/2002
11/30/2002
12/14/2002
12/28/2002
1/11/2003
1/25/2003
2/8/2003
2/22/2003
3/8/2003
3/22/2003
4/5/2003
4/19/2003
5/3/2003
5/17/2003
5/31/2003
Date


CAT CANYON, SANTA BARBARA ISLAND
Depth = 8 meters
Temperature (°C)
22.00
21.00
20.00
19.00
18.00
17.00
16.00
15.00
14.00
13.00
12.00
11.00
10.00
9.00
6/1/2002
6/15/2002
6/29/2002
7/13/2002
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3/22/2003
4/5/2003
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5/3/2003
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5/31/2003
Date