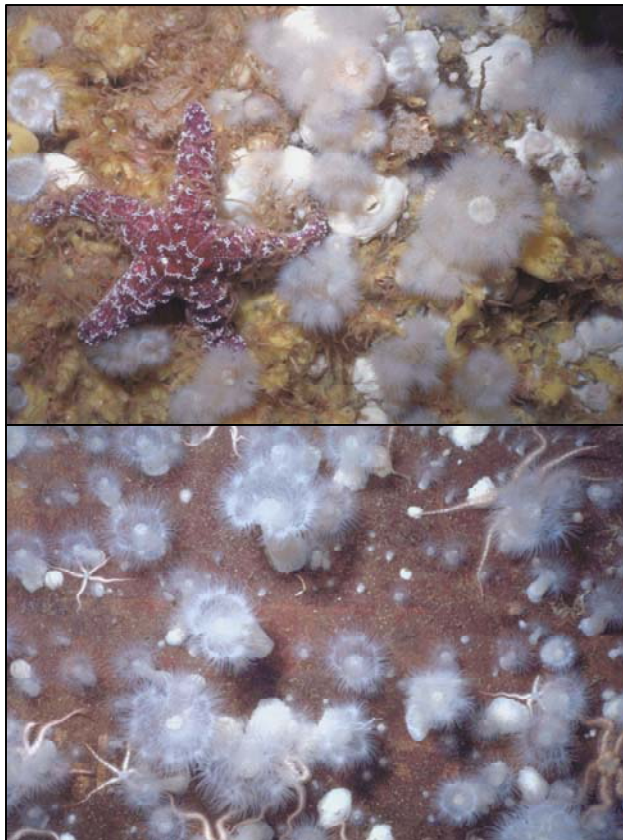


Survey of Invertebrate and Algal Communities on Offshore Oil and Gas Platforms in Southern California

*Final Report
December 2005*



*Survey of Invertebrate and Algal Communities
on Offshore Oil and Gas Platforms
in Southern California*

*Final Report
December 2005*

Prepared for:

U.S. Department of the Interior
Minerals Management Service
Pacific OCS Region
770 Paseo Camarillo
Camarillo, California 93010
Telephone: (805) 389-7810

Prepared by:

Continental Shelf Associates, Inc.
759 Parkway Street
Jupiter, Florida 33477
Telephone: (561) 746-7946

DISCLAIMER

This report was prepared under Contract 1435-01-98-CT-30865 between the Minerals Management Service (MMS), Pacific OCS Region, Camarillo, CA and Continental Shelf Associates, Inc., Jupiter, FL. This report has been technically reviewed by the MMS and has been approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the MMS, nor does mention of trade names or commercial products constitute endorsement or recommendation for use. It is, however, exempt from review and compliance with MMS editorial standards.

REPORT AVAILABILITY

Printed copies of this report may be obtained from the Public Information Office at the following address:

U.S. Department of the Interior
 Minerals Management Service
 Pacific OCS Region
 770 Paseo Camarillo
 Camarillo, California 93010
 Telephone: (805) 389-7810

An Adobe Acrobat version of this report may be accessed online at:

www.mms.gov/omm/pacific

CITATION

Suggested citation:

Continental Shelf Associates, Inc. 2005. Survey of invertebrate and algal communities on offshore oil and gas platforms in southern California: Final report. Prepared for the U.S. Department of the Interior, Minerals Management Service, Pacific OCS Region, Camarillo, CA. December 2005. OCS Study MMS 2005-070. 232 pp. plus appendices.

ABOUT THE COVER

Photographic images acquired during diver and remotely operated vehicle surveys at select California platforms. Clockwise from upper left:

- View of unidentified ophiuroids, *Metridium senile*, *Pisaster ochraceus*, and calcareous worm tubes at 122 m water depth, Platform Hidalgo
- View of *Mytilus* spp., *Metridium senile*, *Balanus* spp., and *Ophiothrix spiculata* at 4 m water depth, Platform Habitat
- View of *Corynactis californica*, *Ophiothrix spiculata*, and encrusters at 41 m water depth, Platform Habitat
- View of *Metridium senile*, turf, bare metal, and *Galathea californiensis* at 177 m water depth, Platform Harvest
- View of *Metridium senile*, *Amphipholis* spp., and turf at 152 m water depth, Platform Gail

TABLE OF CONTENTS

	Page
LIST OF TABLES	vii
LIST OF FIGURES	xi
LIST OF PHOTOS	xv
 EXECUTIVE SUMMARY	 ES-1
 1.0 Introduction	 1
 2.0 Materials and Methods	 5
2.1 Review of Platform Information	5
2.2 Platform Selection and Inspection Videotape Review	5
2.3 Field Surveys	12
2.3.1 Operational Procedures	13
2.3.2 Platform Leg Selection	13
2.3.3 Sampling Procedures	13
2.4 Sample Analyses	15
2.4.1 Quantitative Slide and Videotape Analysis	15
2.4.2 Voucher Collections	16
2.4.3 Scraping Collections	16
2.4.4 Growth Thickness Measurements	17
2.5 Data Analyses	17
 3.0 Results	 19
3.1 Inspection Videotape Review	19
3.2 Field Surveys	19
3.3 Platform Characterization – Photographic Interpretation	25
3.3.1 Platform Gail	26
3.3.2 Platform Grace	34
3.3.3 Platform Harvest	40
3.3.4 Platform Hidalgo	50
3.3.5 Platform Habitat	58
3.3.6 Platform Irene	61
3.4 Diablo and Nifty Rocks – Photographic Interpretation	67
3.4.1 Physical Characteristics	67
3.4.2 Community Description	67
3.5 Random Point Count Analysis	74
3.6 Statistical Analysis of Photographic Data	80
3.6.1 Whole Slide Analysis Photographic Data	80
3.6.2 PointCount’99® Photographic Data	86
3.6.3 Diablo and Nifty Rocks and Comparable Platform Zones	89
3.7 Scraping Analysis	92

TABLE OF CONTENTS (Continued)

	Page
3.8 Statistical Analysis of Scraping Data	94
3.9 Wet Weight Determinations	101
3.10 Individual Mussel Measurements.....	104
3.11 Growth Thickness Measurements.....	104
4.0 Discussion	107
4.1 Overview and Historical Perspective	107
4.2 Study Limitations	109
4.3 Comparisons Between Adjacent Platform Legs.....	110
4.3.1 Platform Gail	111
4.3.2 Platform Grace	113
4.3.3 Platform Harvest	116
4.3.4 Platform Hidalgo	118
4.3.5 Summary of Comparisons for Adjacent Platform Legs	120
4.4 Comparisons Between Platforms	121
4.4.1 Rank Order of Dominant Taxa	121
4.4.2 Density Comparisons.....	130
4.4.3 Percent Cover Comparisons	134
4.4.4 Comparison of Percent Cover Data: PointCount'99® vs. QSA.....	136
4.4.5 Clustering Analyses	141
4.5 Depth Distribution of Platform-Associated Biota.....	145
4.6 Scraping Analysis	153
4.7 Growth Thickness Measurements.....	158
4.8 Platform vs. Natural Hard Bottom - Comparisons of Biota.....	160
4.9 Summary.....	162
5.0 List of Preparers.....	173
6.0 Literature Cited	175
APPENDICES	177
Appendix A Detailed Operational, Sampling, and Safety Procedures and Vessel Modifications	A-1
Appendix B Randomization of Photoquadrats	B-1
Appendix C Data Appendix: Whole Slide Analysis	C-1
Appendix D Scraping Data - Platforms Harvest and Gail.....	D-1
Appendix E Data Appendix: PointCount'99® Analysis	E-1

LIST OF TABLES

Table	Page
2-1 Summary of California OCS candidate platforms, designated units or fields, and platform water depth and installation date by geographic area (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2005)	8
2-2 Summary of sampling conducted during the analysis of invertebrate and algal communities on offshore oil and gas platforms in southern California	9
3-1 Characteristics of platform biotic zones as determined during inspection videotape analysis.....	20
3-2 Summary of platform legs and rocky outcrops sampled during the analysis of invertebrate and algal communities on offshore oil and gas platforms in southern California	24
3-3 Dominant taxa (or physical characteristics) on Leg A1 of Platform Gail identified during quantitative slide analysis	27
3-4 Dominant taxa (or physical characteristics) on Leg B1 of Platform Gail identified during quantitative slide analysis	28
3-5 Dominant taxa (or physical characteristics) on Leg C1 of Platform Grace identified during quantitative slide analysis	35
3-6 Dominant taxa (or physical characteristics) on Leg C4 of Platform Grace identified during quantitative slide analysis	37
3-7 Dominant taxa (or physical characteristics) on Leg B1 of Platform Harvest identified during quantitative slide analysis	43
3-8 Dominant taxa (or physical characteristics) on Leg B2 of Platform Harvest identified during quantitative slide analysis	45
3-9 Dominant taxa (or physical characteristics) on Leg A1 of Platform Hidalgo identified during quantitative slide analysis	51
3-10 Dominant taxa (or physical characteristics) on Leg B1 of Platform Hidalgo identified during quantitative slide analysis	53
3-11 Dominant taxa on Leg A1 of Platform Habitat identified during quantitative slide analysis.....	59
3-12 Dominant taxa on Leg A1 of Platform Irene identified during quantitative slide analysis	64

LIST OF TABLES (Continued)

Table	Page
3-13 Dominant taxa on natural substrate of Diablo and Nifty Rocks identified during quantitative slide analysis	69
3-14 Dominant taxa on the six platforms as determined by PointCount'99® analysis	76
3-15 Designations of zones used in the clustering analysis of photographic data.....	81
3-16 Summary of the most common taxa identified, their relative abundance, frequency of occurrence, and mean relative abundance per occurrence, as determined from scraping samples collected at Platform Harvest.....	95
3-17 Summary of the most common taxa identified, their relative abundance, frequency of occurrence, and mean relative abundance per occurrence, as determined from scraping samples collected at Platform Gail	97
3-18 Summary species list for scraping samples used in the correspondence analysis	99
3-19 Summary of weight measurements for scraping samples from Platform Harvest	103
3-20 Summary of mussel measurements of scraping samples collected from Platform Harvest.....	105
3-21 Summary of growth thickness measurements.....	106
4-1 Comparison of taxa between Legs A1 and B1 of Platform Gail based on the results of quantitative slide analysis	112
4-2 Comparison of taxa between Legs C1 and C4 of Platform Grace based on the results of quantitative slide analysis	114
4-3 Comparison of taxa between Legs B1 and B2 of Platform Harvest based on the results of quantitative slide analysis	117
4-4 Comparison of taxa between Legs A1 and B1 of Platform Hidalgo based on the results of quantitative slide analysis	119
4-5 Summary of rankings for each of the top 12 taxa (based on density) identified during quantitative slide analysis, by platform leg	122
4-6 Summary of rankings for each of the top 12 taxa (based on percent cover) identified during quantitative slide analysis, by platform leg	126

LIST OF TABLES
(Continued)

Table	Page
4-7 Comparison of average rankings – density vs. percent cover – for the dominant taxa, all platforms.....	129
4-8 Minimum, maximum, and average densities of select dominant taxa (based on numerical abundance) by platform	131
4-9 Minimum, maximum, and average coverage of select dominant taxa (based on percent cover) by platform	135
4-10 Comparison of dominant taxa on the six platforms – PointCount’99® vs. QSA – based on percent cover estimates	137
4-11 Comparison of biotic zones and species/taxon presence by depth at six platforms	146
4-12 Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of platforms Gail and Harvest.....	155
4-13 Presence and depth of occurrence of species found both on platforms and natural hard bottom areas	161
4-14 Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks.	163

LIST OF FIGURES

Figure		Page
1-1	Southern California Planning Area, including currently designated fields or units (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2001)	2
2-1	Santa Maria Basin OCS operations (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2001)	6
2-2	East Santa Barbara Channel OCS operations (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2001)	7
2-3	Location of Diablo Rock, Santa Cruz Island, California.....	10
2-4	Location of Nifty Rock, San Miguel Island, California.....	11
3-1	Zonation patterns evident from videotape analysis of (a) Platform Gail and (b) Platform Grace, as viewed from an outboard perspective	21
3-2	Zonation patterns evident from videotape analysis of (a) Platform Harvest and (b) Platform Hidalgo, as viewed from an outboard perspective.....	22
3-3	Zonation patterns evident from videotape analysis of (a) Platform Habitat and (b) Platform Irene, as viewed from an outboard perspective	23
3-4	Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Gail determined from quantitative slide analysis	32
3-5	Density and depth distribution of the six numerically dominant taxa on Leg B1 of Platform Gail determined from quantitative slide analysis.....	33
3-6	Density and depth distribution of the six numerically dominant taxa on Leg C1 of Platform Grace determined from quantitative slide analysis.....	41
3-7	Density and depth distribution of the six numerically dominant taxa on Leg C4 of Platform Grace determined from quantitative slide analysis.....	42
3-8	Density and depth distribution of the six numerically dominant taxa on Leg B1 of Platform Harvest determined from quantitative slide analysis	48
3-9	Density and depth distribution of the six numerically dominant taxa on Leg B2 of Platform Harvest determined from quantitative slide analysis	49
3-10	Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Hidalgo determined from quantitative slide analysis	56

LIST OF FIGURES (Continued)

Figure	Page
3-11 Density and depth distribution of the six numerically dominant taxa on Leg B1 of Platform Hidalgo determined from quantitative slide analysis.....	57
3-12 Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Habitat determined from quantitative slide analysis	63
3-13 Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Irene determined from quantitative slide analysis.....	68
3-14 Density and depth distribution of the six numerically dominant taxa at Diablo and Nifty Rocks determined from quantitative slide analysis.....	75
3-15 Dendrogram of count data from the quantitative slide analysis, by platform leg.....	82
3-16 Dendrogram of percent cover data from the quantitative slide analysis, by platform leg	84
3-17 Dendrogram of count data from the quantitative slide analysis, by biotic zone for all platforms.....	85
3-18 Dendrogram of percent cover data from the quantitative slide analysis, by biotic zone for all platforms	87
3-19 Dendrogram of PointCount data, by platform leg.....	88
3-20 Dendrogram of PointCount data, by biotic zone for all platforms.....	90
3-21 Dendrogram of count data from the quantitative slide analysis - platform legs versus natural outcrops	91
3-22 Dendrogram of percent cover data from the quantitative slide analysis - platform legs versus natural outcrops.....	93
3-23 Correspondence analysis results, as determined through the comparison of mussel and barnacle zones for each of the six platforms and Diablo and Nifty Rocks.....	102
4-1 Generalized depth distribution of dominant species present at platforms Gail and Grace	150
4-2 Generalized depth distribution of dominant species present at platforms Harvest and Hidalgo	151

LIST OF FIGURES
(Continued)

Figure	Page
4-3 Generalized depth distribution of dominant species present at platforms Habitat and Irene	152
4-4 Mussel thickness at platforms Harvest and Irene	159
4-5 Generalized depth distribution of select biota - all platforms	168

LIST OF PHOTOS

Photo	Page
1	View of (1) <i>Metridium exilis</i> , (2) <i>Corynactis californica</i> , and (3) tan and yellow encrusting sponges at -47 m (-153 ft), Leg B1, Platform Gail 29
2	View of (1) <i>Metridium senile</i> , (2) <i>Amphipholis</i> spp., and (3) turf at -152 m (-500 ft), Leg B1, Platform Gail 29
3	View of (1) <i>Mytilus</i> spp., (2) <i>Metridium senile</i> , and some (3) <i>Metridium exilis</i> at -1 m (-4 ft), Leg B1, Platform Gail 31
4	View of (1) <i>Corynactis californica</i> , (2) tan encrusting sponge, and (3) <i>Metridium farcimen</i> at -51 m (-168 ft), Leg A1, Platform Gail 31
5	View of (1) <i>Mytilus</i> spp., (2) <i>Balanus</i> spp., and (3) filamentous red algae at -2 m (-8 ft), Leg C1, Platform Grace..... 38
6	View of (1) <i>Corynactis californica</i> , (2) filamentous red algae, and (3) encrusting sponges at -19 m (-61 ft), Leg C1, Platform Grace 38
7	View of (1) <i>Paracyathus stearnsii</i> , (2) <i>Coenocyathus bowersi</i> , and (3) <i>Metridium farcimen</i> at -53 m (-174 ft), Leg C1, Platform Grace..... 39
8	View of (1) <i>Paracyathus stearnsii</i> , (2) <i>Ophiothrix spiculata</i> , (3) <i>Asterina miniata</i> , and turf at -74 m (-242 ft), Leg C1, Platform Grace 39
9	View of (1) <i>Mytilus</i> spp., (2) <i>Metridium senile</i> , (3) <i>Balanus</i> spp., and (4) filamentous red algae at -2 m (-6 ft), Leg B1, Platform Harvest 46
10	View of (1) <i>Metridium senile</i> , (2) tan branching bryozoan colonies, (3) red encrusters, and (4) unidentified ophiuroids at -90 m (-294 ft), Leg B2, Platform Harvest..... 46
11	View of (1) <i>Balanus nubilus</i> , (2) <i>Metridium senile</i> , and (3) turf at -47 m (-153 ft), Leg B2, Platform Harvest..... 47
12	View of (1) <i>Metridium senile</i> , (2) turf, (3) bare metal, and (4) <i>Galathea californiensis</i> at -177 m (-580 ft), Leg B2, Platform Harvest 47
13	View of (1) <i>Metridium senile</i> , (2) <i>Anthopleura elegantissima</i> (rosy morph), and (3) <i>Strongylocentrotus purpuratus</i> at -14 m (-45 ft), Leg B1, Platform Hidalgo..... 54
14	View of (1) <i>Mytilus</i> spp. and associated fauna at -2 m (-6 ft), Leg B1, Platform Hidalgo 54

LIST OF PHOTOS

Photo	Page
15	View of (1) unidentified ophiuroids, (2) <i>Metridium senile</i> , (3) <i>Pisaster ochraceus</i> , and (4) <i>Leucetta losangelensis</i> at -30 m (-99 ft), Leg A1, Platform Hidalgo 55
16	View of (1) <i>Metridium senile</i> , (2) turf, (3) various encrusters, and (4) calcareous worm tubes at -122 m (-399 ft), Leg B1, Platform Hidalgo 55
17	View of (1) <i>Mytilus</i> spp., (2) <i>Metridium senile</i> , (3) <i>Balanus</i> spp., and (4) <i>Ophiothrix spiculata</i> at -4 m (-13 ft), Leg A1, Platform Habitat..... 60
18	View of (1) <i>Mytilus</i> spp., (2) filamentous red algae, (3) <i>Metridium senile</i> , (4) <i>Balanus</i> spp., and (5) <i>Anthopleura elegantissima</i> (rosy morph) at -5 m (-18 ft), Leg A1, Platform Habitat..... 60
19	View of (1) <i>Corynactis californica</i> , (2) <i>Ophiothrix spiculata</i> , and encrusters at -41 m (-134 ft), Leg A1, Platform Habitat 62
20	View of (1) undescribed zoanthid anemones (<i>Palythoa</i>) at -82 m (-269 ft), Leg A1, Platform Habitat..... 62
21	View of (1) <i>Mytilus californianus</i> , (2) <i>Metridium senile</i> , (3) <i>Tetraclita squamosa</i> , and other barnacles at -1 m (-4 ft), Leg A1, Platform Irene 65
22	View of (1) <i>Mytilus californianus</i> , (2) <i>Metridium senile</i> , (3) <i>Anthopleura elegantissima</i> (rosy morph), and (4) <i>Pisaster ochraceus</i> at -9 m (-31 ft), Leg A1, Platform Irene..... 65
23	View of (1) <i>Metridium senile</i> and (2) encrusting sponges at -44 m (-145 ft), Leg A1, Platform Irene..... 66
24	View of (1) <i>Metridium farcimen</i> (and possibly <i>M. senile</i>), (2) <i>Asterina miniata</i> , and (3) calcareous worm tubes at -71 m (-232 ft), Leg A1, Platform Irene 66
25	View of (1) yellow staghorn bryozoa, (2) <i>Strongylocentrotus purpuratus</i> , (3) <i>S. franciscanus</i> , (4) <i>Urticina</i> spp., (5) a solitary <i>Anthopleura</i> spp., and (6) turf at -14 m (-45 ft), Diablo Rock..... 71
26	View of (1) <i>Paracyathus stearnsii</i> , (2) <i>Balanophyllia elegans</i> , (3) an encrusting alga (<i>Lithothamnion</i>), and turf at -17 m (-55 ft), Nifty Rock 71
27	View of (1) <i>Mytilus californianus</i> , (2) filamentous red algae, (3) an encrusting alga (<i>Lithothamnion</i>), (4) <i>Anthopleura xanthogrammica</i> , and (5) <i>A. elegantissima</i> at -8 m (-25 ft), Diablo Rock 72
28	View of (1) <i>Corynactis californica</i> , (2) an encrusting alga (<i>Lithothamnion</i>), and (3) <i>Chthalamus</i> spp. at -15 m (-50 ft), Diablo Rock 72

LIST OF PHOTOS
(Continued)

Photo	Page
29 View of (1) <i>Anthopleura elegantissima</i> , (2) filamentous red algae, and (3) <i>Strongylocentrotus purpuratus</i> at -11 m (-35 ft), Diablo Rock.....	73
30 View of (1) a <i>Bossiella</i> -type coralline alga at -14 m (-45 ft), Nifty Rock	73

Executive Summary

ES-1 Introduction

During the 23-year period between 1967 and 1989, 24 oil and gas production facilities were installed in Federal waters offshore California, including the Santa Maria Basin, the Santa Barbara Channel, and San Pedro Bay. Most of the platforms were installed to produce oil and gas, with only two facilities installed for oil and/or gas processing. To date, only one of these facilities has been decommissioned and removed, leaving 23 oil and gas platforms currently on the southern California outer continental shelf (OCS).

While more than 1 billion barrels of oil and 1.3 trillion cubic feet of gas have been produced from these operations (through March 2003), production volumes from Federal waters offshore California are presently reflecting a general decrease over time. Given the projected life expectancy of production operations at these facilities (i.e., projected decommissioning and removal of several platforms in the next several years), the Minerals Management Service (MMS) has a vested regulatory mandate and scientific interest in properly characterizing platform-associated communities. As with most biological systems, there are recognized data gaps in our knowledge of marine ecosystems. In particular, the invertebrate and algal populations found in association with California's offshore oil and gas platforms have not been fully characterized. To address these information gaps as they pertain to platform-associated communities, this study had four specific objectives:

- (1) Determine abundance, density, and depth distribution/vertical zonation characteristics of invertebrate and algal communities on selected platforms and natural reefs;
- (2) Quantify biomass production estimates of invertebrate and algal communities on platforms (and natural reefs, where practical);
- (3) Conduct the research using methods that are similar or complementary to those being used in related studies; and
- (4) Evaluate and discuss the relative importance of platform-associated invertebrate and algal communities to the ecology of the region.

ES-2 Methods

Platform Selection and Inspection Videotape Review

All platforms on the California OCS were considered as potential sampling sites during the platform selection process. Criteria for selection included a consideration of water depth and geographic location. Considering mesoscale oceanographic conditions, the platforms found within the Santa Barbara Channel and Santa Maria Basin regions were identified as optimal candidates for study. Further, water depths in which these facilities are found range from relatively shallow to deep (i.e., shallowest at Platform Gina in 29 m of water; deepest at Platform Harmony in 365 m of water). Eight platforms were identified as preferred sampling locations – platforms Irene, Hidalgo, Harvest, and Hermosa in the Santa Maria Basin, Platform Hondo in the western Santa Barbara Channel, and platforms Grace, Gail, and Habitat in the eastern Santa Barbara Channel (**Figure ES-1**).

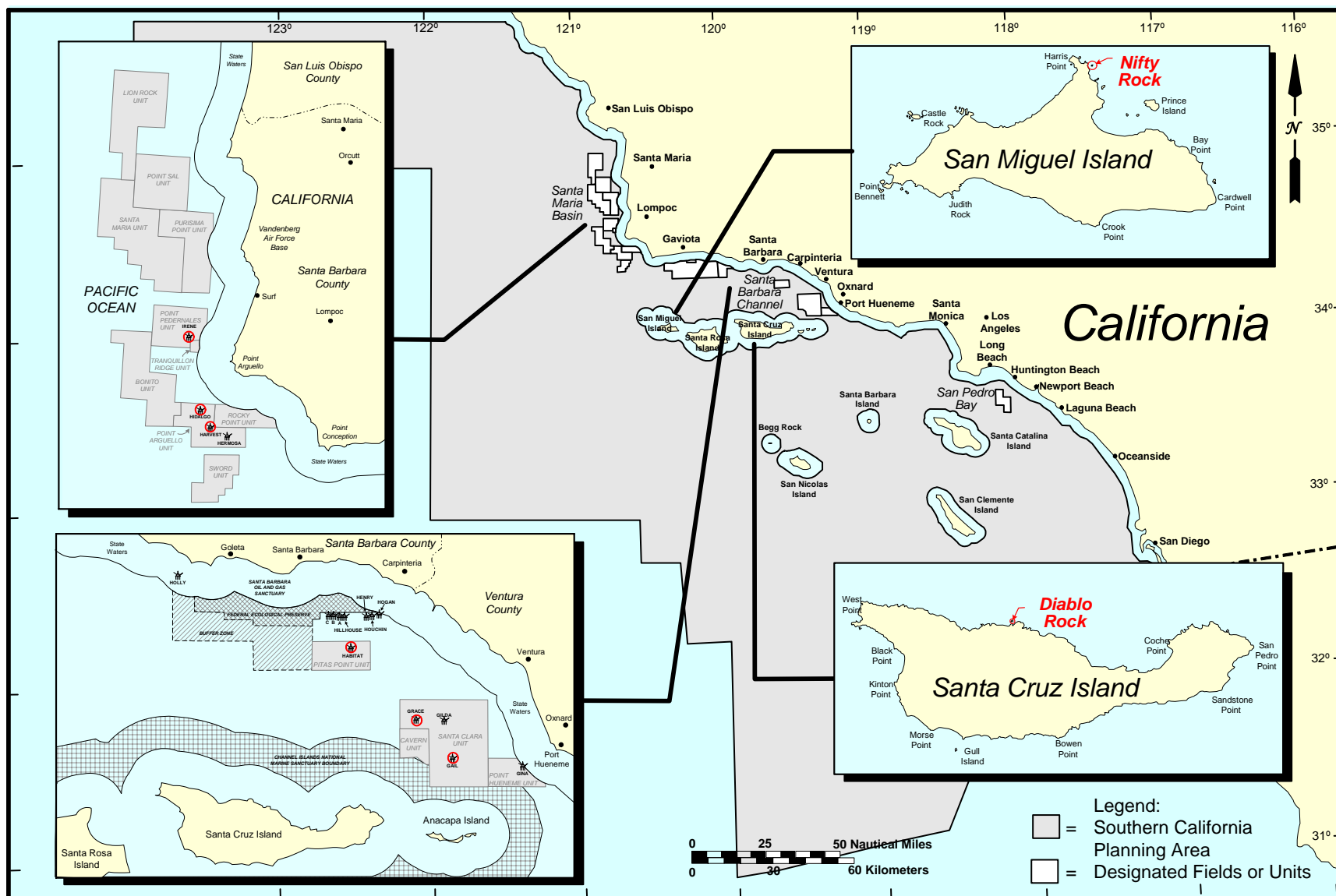


Figure ES-1. Locations sampled during the survey of invertebrate and algal communities on offshore oil and gas platforms in southern California, including several naturally occurring rock outcrops.

Study platform locations were considered representative of the diversity of the California OCS – including platforms in both shallow and deep water, and within potentially different biogeographic regimes. Among these eight facilities, four *primary platforms* were selected for more intense sampling – Grace, Gail, Hidalgo, and Harvest; at each of these primary platforms, two outer legs were photographed and videotaped. Four additional *secondary platforms* were also selected – Hondo, Hermosa, Habitat, and Irene; at these locations, only single outer legs were slated for photographic and videotape characterization. Platforms Grace and Hidalgo are both located in relatively shallow water (i.e., 97 to 131 m), with one platform in the Santa Barbara Channel and the other in the Santa Maria Basin. Platforms Gail and Harvest are located in intermediate to deep waters (i.e., 206 to 225 m), with one platform in the Santa Barbara Channel and the other in the Santa Maria Basin. For the secondary platforms, platforms Habitat and Irene are located in relatively shallow water depths (i.e., 74 to 88 m) either within the Santa Barbara Channel or Santa Maria Basin. Due to operational restrictions and/or weather constraints, platforms Hondo and Hermosa were not sampled. Also of interest to this study effort were the invertebrate and algal communities found in association with naturally occurring rock outcrops or pinnacles. Only a limited number of suitable candidate sites were identified, most of which occur off the northern Channel Islands. Diablo and Nifty Rocks (**Figure ES-1**) were selected for sampling using similar quantitative photographic techniques.

Sampling emphasized collection of 35-mm slide transparencies (i.e., photoquadrats) and high resolution color video, each of which was collected via diver (from the intertidal zone to 24 m subsurface) and ROV (from 24 m subsurface to the seafloor) at platforms and rock outcrops. In addition, “scraping” collections (i.e., removal of all epibiota within a prescribed area) and thickness/depth measurements (i.e., measurement from the outer portion of the community inward to the platform leg) were also completed at several platforms, as detailed in **Table ES-1**.

Table ES-1. Summary of sampling conducted during the analysis of invertebrate and algal communities on offshore oil and gas platforms in southern California.

Platform and Leg(s) Sampled	Diver Video	Diver Photos	ROV Video	ROV Photos	Scraping	Growth
<i>Primary Platforms (2 legs per platform)</i>						
Gail – Legs A1, B1	+	+	+	+	+	-
Grace – Legs C1, C4	+	+	+	+	-	-
Harvest – Legs B1, B2	+	+	+	+	+	+
Hidalgo – Leg A1, B1	+	+	+	+	-	-
<i>Secondary Platforms (1 leg per platform)</i>						
Habitat – Leg A1	+	+	+	+	-	-
Irene – Leg A1	+	+	+	+	-	+
<i>Offshore Rocks/Pinnacles</i>						
Diablo Rock	+	+	-	-	-	-
Nifty Rock	+	+	-	-	-	-
Key: + = data collected; - = no sampling required; ROV = remotely operated vehicle.						

After primary and secondary platforms were identified, biologists reviewed MMS inspection videotapes to establish preliminary biotic zonation patterns along the outer portions of the legs of each platform to be sampled. Depth and range characteristics of these biotic zones were used in determining where discrete samples (e.g., photographs, scrapings) were to be taken during subsequent field surveys.

Field Surveys

Field surveys were completed in several phases between 1998 and 2000. A preliminary survey was conducted in October 1998 to test the various diver and ROV systems. Full surveys at six platforms were completed between October 1999 and November 2000. All surveys were completed using the R/V *Dawn*, a 30-m (100-ft) research vessel. Scientific divers and a Phantom HD2 ROV were employed to collect high resolution color video and 35-mm slide transparencies from one or two platform legs. The depth at which each photograph was collected was predetermined using a randomized sampling approach. Divers also collected 0.0625-m² scraping samples from select platform legs.

Sample Analyses

Sample analyses included videotape review, quantitative slide analysis (QSA), and point count analysis. QSA (also called whole slide analysis) entailed projection of the 35-mm slide image onto a large screen and the taxonomic identification and enumeration of biota present (i.e., abundance [individual counts] and percent cover). QSA encompassed complete identification of specimens within each slide (i.e., taxonomic identification of all biota to the lowest practical taxon). QSA protocols called for identification of biota within 15 photographs (i.e., 0.0625-m² photoquadrats) per biotic zone for each platform leg and rock outcrop/pinnacle sampled. Following completion of the whole slide analysis, all 35-mm slide transparencies were digitized to facilitate error checking and as a prelude to completion of point count analysis. During point count analysis, digital images were processed using PointCount'99® software to identify biota present beneath 50 randomly placed points.

Scraping samples from the mussel and barnacle/scallop zones of platforms Gail and Harvest were analyzed. Total sample weight and mussel weight measurements were made on scraping samples. Individual mussels from Platform Harvest were measured and weighed. Whole scraping samples were subsequently sorted into major phylogenetic groups, identified to the lowest practical taxon, and categorized as to relative abundance.

Growth thickness measurements were completed by divers during sampling operations at platforms Harvest and Irene. A hand-held ruler was used at varying water depths and the thickness of the biota present (e.g., from the outer edge of the mussel bed to the platform leg) was measured and recorded.

Data Analyses

Six basic questions related to community composition, intra- and inter-platform variability, and zonation patterns were addressed in the analysis of the data with the overall purpose to determine density, percent cover, and depth distribution/vertical zonation characteristics of invertebrate and algal communities on selected platforms:

- What benthic biota live on platforms?
- Do platform benthic biota differ between legs (primary platforms)?
- Do platform benthic biota differ between platforms (all platforms sampled)?
- Do platform benthic biota differ between depth zones?
- Do platform benthic biota differ between oceanographic regions?
- Do platform benthic biota differ between platforms and pinnacles?

To evaluate how benthic biota differ between zones, estimates of percent cover (and available count data) for individual biotic zones were used in a separate cluster analysis. The replicates within each biotic zone were pooled at individual platform legs, providing a means to evaluate the occurrence and similarities of the biotic zones. There was no weighting for the analysis of biotic zones.

A reduced portion of the data set was also analyzed to compare platform legs to the pinnacles. Because there was no distinct vertical zonation evident at the pinnacles, the data were pooled over the pinnacle and individual platform legs for the applicable depth zones. Specifically, only the samples occurring within the 5 to 17 m depth range from the platforms were used in this portion of the data analysis because these correspond to the depth range of the biota sampled at the pinnacles.

ES-3 Results and Discussion

Inspection Videotape Review

Four to six distinct biotic zones (i.e., zonation patterns) were evident, depending upon platform depth (**Table ES-2**). As platform depth increased, the total number of biotic zones increased. Platforms in shallower water (e.g., platforms Grace, Hidalgo, Habitat, and Irene) exhibited four or five zones, while the deeper platforms (e.g., platforms Gail and Harvest) possessed additional vertical substrate for a sixth platform-associated community.

Based on inspection videotape review, several observations of platform-associated community structure were noteworthy:

- *Mytilus* was always present, therefore there was always a mussel zone whose vertical extent and lower boundary were quite variable;
- Barnacles were typically present above and/or below the mussel zone;
- Encrusters (e.g., sponges) were routinely present at depth, often in conjunction with various cnidarian species (e.g., *Metridium*, *Corynactis*, *Paracyathus*); and
- Beneath the intertidal, barnacle, and mussel zones, considerable variability in faunal composition was suggested.

Table ES-2. Characteristics of platform biotic zones as determined during inspection videotape analysis.

Biotic Zone	Zone Depth (m [ft] subsurface)	Vertical Extent (m [ft])
Primary Platforms -		
Platform Gail		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 12.1 (6 to 40)	10.3 (34)
Barnacle/Scallop	12.1 to 48.8 (40 to 160)	36.7 (120)
<i>Corynactis</i> /Encruster	48.8 to 115.8 (160 to 380)	67.0 (220)
Vase sponge/Encruster	115.8 to 192.0 (380 to 630)	76.2 (250)
Encruster/Sea Star/Cup Coral	192.0 to 225.2 (630 to 739)	33.2 (109)
Platform Grace		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 13.7 (6 to 45)	11.9 (39)
Barnacle/Scallop	13.7 to 27.4 (45 to 90)	13.7 (45)
Anemone/Encruster	27.4 to 70.1 (90 to 230)	42.6 (140)
Encruster/Sea Star	70.1 to 96.9 (230 to 318)	26.8 (88)
Platform Harvest		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 25.9 (6 to 85)	24.1 (79)
Barnacle/ <i>Corynactis</i>	25.9 to 50.3 (85 to 165)	24.4 (80)
Anemone/Encruster	50.3 to 105.2 (165 to 345)	54.9 (180)
Vase Sponge/Encruster	105.2 to 169.2 (345 to 555)	64.0 (210)
<i>Metridium</i> /Sea Star	169.2 to 205.7 (555 to 675)	36.6 (120)
Platform Hidalgo		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 19.8 (6 to 65)	18.0 (59)
Barnacle	19.8 to 32.0 (65 to 105)	12.1 (40)
<i>Metridium</i> /Encruster	32.0 to 109.7 (105 to 360)	77.7 (255)
Sponges/Encruster	109.7 to 132.3 (360 to 434)	22.5 (74)
Secondary Platforms -		
Platform Habitat		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 18.3 (6 to 60)	16.5 (54)
<i>Corynactis</i>	18.3 to 54.9 (60 to 180)	36.6 (120)
<i>Metridium</i> /Encruster	54.9 to 88.4 (180 to 290)	33.5 (110)
Platform Irene		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
Barnacle/Algae	1.8 to 10.7 (6 to 35)	8.8 (29)
<i>Mytilus</i>	10.7 to 25.9 (35 to 85)	15.2 (50)
<i>Corynactis</i> /Encruster	25.9 to 73.4 (85 to 242)	47.9 (157)

Photographic Analysis

Based on the identification and enumeration of all flora and fauna present in each photoquadrat, 149 taxa (i.e., species level or higher) were identified (**Table ES-3**) on the six platforms. An additional 24 taxa were observed on the rock outcrops, for a total of 173 taxa identified at all sites sampled. During QSA, 821 photographs were characterized completely. The composite species list included representatives from several invertebrate phyla – mollusks (e.g., *Mytilus*), cnidarians (e.g., *Metridium*, *Corynactis*, *Anthopleura*), crustaceans (e.g., *Balanus*), polychaetes (e.g., worm tubes), echinoderms (e.g., *Ophiothrix*), and minor phyla (i.e., sponges, bryozoans, tunicates). Green, brown, and red algae were also identified. Fifty-five taxa total were identified during PointCount'99® analysis in which 883 photographs from six platforms were evaluated.

Photographic analysis of all species present (i.e., quantitative slide analysis) provided an estimate of both total density and percent cover for all specimens present on each photograph (image area: 0.0625 m²). Individual counts were important as a means of identifying numerical dominants, determining relative species densities, and as one basis for comparing platform legs. Estimates of percent cover were important for those species where individual counts were more difficult to acquire or where counts were not truly representative (e.g., with colonial taxa or major “community formers”). Percent cover estimates were also used in a comparison of platform legs.

Total density and percent cover estimates were used to rank dominant taxa. For the primary platforms, density and percent cover of dominant taxa were compared between adjacent legs, providing an indication of intra-platform variability. For both primary and secondary platforms, density and percent cover were used to compare taxa, providing an indication of inter-platform variability.

Platform Gail

This 8-legged platform is located in 225 m (739 ft) of water in the eastern Santa Barbara Channel. Legs A1 and B1 were sampled at Platform Gail from the intertidal zone to the base of each platform leg. Based on complete analysis of 196 photographs from both legs, 74 total taxa were identified, of which 41 percent (30) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with a few specimens enumerated at higher taxonomic levels. Only five floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Codium*; encrusting coralline algae; filamentous green algae; foliose red algae) were among the 74 total taxa observed. One undifferentiated assemblage (turf) and one physical characteristic (bare metal) were also observed at Platform Gail. There were also indications that the upper portions (i.e., within the upper 8 m) of both legs of Platform Gail had been recently cleaned. Density-dominant species included *Corynactis californica*, *Metridium exilis*, *Metridium senile*, filamentous red algae, *Ophiothrix spiculata*, and *Mytilus* spp. Percent cover dominants included *Corynactis californica*, *Mytilus* spp., *Metridium senile*, *Anthopleura elegantissima* (rosy morph), and *Metridium exilis*.

Table ES-3. Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks. Dominant species or taxa, as determined via ranking of the top 12 taxa by density or percent cover, noted in bold type; dominant species shown separately for platforms (P), rock outcrops (R), or both (P+R).

<p>FLORA: Algae: Alga, brown, blade Alga, brown, clump Alga, coralline, encrusting Alga, encrusting (<i>Lithothamnion</i>) (R) Alga, green clump Alga, green clump (<i>Codium</i>-like) (R) Alga, green encrusting (P) Alga, green filamentous Algae, red filamentous (P+R) Algae, red foliose (P) <i>Bossiella</i> spp. (R) <i>Codium</i> spp. <i>Corallina</i> spp. (P) <i>Egregia</i> spp. <i>Rhodymenia ?lobata</i> <i>Rhodymenia</i> spp. <i>Ulva lactuca</i> (P)</p> <p><i>Note: Algae broadly characterized due to limitations of photographic resolution and interpretation.</i></p> <p>FAUNA: Crustaceans: Barnacles (Cirripedia): <i>Balanus nubilus</i> (P) <i>Balanus</i> spp. (P+R) Barnacle, unidentified <i>Chthalamus</i> spp. (R) <i>Pollicipes polymerus</i> (P) <i>Tetraclita squamosa</i> (P) Decapod crabs (Decapoda): <i>Cancer antennarius</i> <i>Cancer</i> spp. <i>Hemigrapsus nudus</i> Galatheid crabs (Galatheidae): <i>Galathea californiensis</i></p>	<p>Echinoderms: Sea stars (Asteroidea): <i>Asterina miniata</i> (=Patiria) <i>Dermasterias imbricate</i> <i>Henricia leviuscula</i> <i>Henricia sanguinolenta</i> <i>Orthasterias koehleri</i> <i>Pisaster brevispinus</i> <i>Pisaster giganteus</i> <i>Pisaster ochraceus</i> (P) <i>Poraniopsis inflata</i> <i>Pycnopodia helianthoides</i> <i>Stylasterias forreri</i> Urchins (Echinoidea): <i>Allocentrotus fragilis</i> <i>Lytechinus pictus</i> <i>Strongylocentrotus franciscanus</i> <i>Strongylocentrotus purpuratus</i> (R) Brittle stars (Ophiuroidea): <i>Amphipholis</i> spp. (P) <i>Ophiocantha diplasia</i> <i>Ophiothrix spiculata</i> (P+R) Ophiuroid, unidentified (P) Holothuroids (Holothuroidea): <i>Dendrochirotida</i>, unidentified (R) <i>Parastichopus californicus</i> Crinoids (Crinoidea): <i>Florumetra serratissima</i></p> <p>Mollusks: Bivalves (Pelecypoda): Anomiidae, unidentified Bivalve, nestling, unidentified <i>Chama arcana</i> <i>Crassadoma gigantea</i> Mytilidae, unidentified <i>Mytilus californianus</i> (P+R) <i>Mytilus</i> spp. (P)</p>	<p>Gastropods (Gastropoda): Aeolid (SF Aeolidiidae), unidentified <i>Aeolidia papillosa?</i> Aeolidioidea, unidentified <i>Anisodoris nobilis</i> <i>Archidoris montereyensis</i> <i>Calliostoma</i> spp. <i>Cypraea spadicea</i> <i>Dialula sandiegensis</i> Dorid, white, unidentified Dorid, yellow, unidentified (?<i>Doriopsilla</i>) Doridacea, unidentified <i>Flabellina iodinea</i> Gastropoda, unidentified <i>Hermisenda crassicornis</i> <i>Pleurobranchaea californica</i> <i>Serpulorbis</i> spp. <i>Triopha catalinae</i> (P) Chitons (Polyplacophora): Chiton, unidentified</p> <p>Polychaetes: <i>Eudistylia polymorpha</i> (P) Sabellidae/Serpulidae, unidentified (feather duster worm) <i>Protula superba</i> (P) <i>Salmacina</i> spp. Serpulidae, unidentified Spionidae, unidentified <i>Spirobranchus</i> spp. Tube worm, double spiral Tube worm, single fan Worm tubes, calcareous (P) Worm tubes, plain (P)</p>
--	--	--

Table ES-3. Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks. Dominant species or taxa, as determined via ranking of the top 12 taxa by density or percent cover, noted in bold type; dominant species shown separately for platforms (P), rock outcrops (R), or both (P+R) (continued).

<p>Cnidarians: Anthozoans (Actiniaria): Actiniaria, brown Actiniaria, pink <i>Amphianthus californicus</i> Anemone, pink Anemone, unidentified <i>Anthopleura elegantissima</i> (rosy morph) (P+R) <i>Anthopleura</i> spp. <i>Anthopleura</i> spp. (whitish, no rose) (P) <i>Anthopleura xanthogrammica</i> (R) Anthozoa, unidentified <i>Astrangia</i> spp. <i>Balanophyllia elegans</i> (R) <i>Coenocyathus bowersi</i> (P) <i>Corynactis californica</i> (P+R) Cup coral, white, unidentified <i>Desmophyllum dianthus</i> (P) <i>Epiactis prolifera</i>? Gorgonian, unidentified <i>Metridium exilis</i> (P) <i>Metridium farcimen</i> (P) <i>Metridium senile</i> (P+R) <i>Metridium</i> spp. (P) <i>Metridium</i> spp., dark or Feather Duster <i>Palythoa</i> (tan zoanthid) (P) <i>Palythoa</i> (tan) <i>Paracyathus stearnsii</i> (P) <i>Urticina</i> spp. Zoanthid (<i>Palythoa</i>) (P) Zoanthid, colonial tan (P) Zoanthid, solitary tan</p>	<p>Hydrozoans: Hydrozoa, colony Hydrozoa, tan clump <i>Plumularia</i> spp. (P) <i>Eudendrium</i> spp.? Hydroid, pink Hydroid, tan (P) Hydroid, tan branching (P) Hydroid, white</p> <p>Minor Phyla: Sponges (Porifera): <i>Cliona</i> spp., yellow <i>Halichondria panicea</i> (P) <i>Leucetta losangelensis</i> (P) <i>Leucilla nuttingi</i> <i>Leucetta</i> spp. (P) Sponge, gray encrusting (P) Sponge, green encrusting (P) Sponge, orange encrusting (P) Sponge, orange round Sponge, purple encrusting Sponge, tan cup (P) Sponge, tan encrusting (P) Sponge, tan foliose encrusting Sponge, tan globose Sponge, unidentified (R) Sponge, white encrusting (P) Sponge, white finger Sponge, yellow encrusting (P) <i>Staurocalyptus</i> spp. (P)</p> <p>Bryozoans (Bryozoa): Bryozoa, staghorn, yellow (R) Bryozoa, tan branching (P) Bryozoa, white branching <i>Bugula</i> spp. <i>Crisia/Filicrisia</i> spp. <i>Hippodiplosia</i> spp.</p>	<p>Tunicates (Urochordata, Ascidiacea): <i>Amaroucium</i> spp. <i>Aplidium</i> spp. <i>Botrylloides</i> spp. <i>Halocynthia igaboja</i> <i>Styela</i> spp. Tunicate, encrusting tan (P) Tunicate, encrusting translucent (P) Tunicate, globular, unidentified Tunicate, solitary, unidentified Urochordata, unidentified</p> <p>Fishes (Osteichthyes): <i>Oxylebius pictus</i> <i>Sebastes</i> spp.</p> <p>Undifferentiated Assemblages and Encrusters: Algae/hydrozoa mix Bryozoa turf (P) Encruster, blue (P) Encruster, gray Encruster, green Encruster, lavender (P) Encruster, orange Encruster, pink Encruster, red (P) Encruster, tan (P) Encruster, white Encruster, yellow (P) Turf (P+R)</p> <p>Physical Characteristics: Bare metal (P) Line (P)</p> <p>Total: 173 taxa, including undifferentiated assemblages and encrusters, plus physical characteristics</p>
---	---	--

In terms of unique characteristics, Platform Gail (1) exhibited an unusual trend, specifically notable in the species identified within the anthozoan mix – the presence of dense colonies of *Metridium exilis*; (2) a *Desmophyllum dianthus* zone evident along the lower portions of both Legs A1 and B1; and (3) *Corynactis californica*, usually a dominant species at depth, was supplanted by *M. exilis* on Leg B1.

The top three density-dominant taxa common to both legs on Platform Gail (i.e., *Corynactis californica*, *Metridium exilis*, and *Metridium senile*) exhibited considerable between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence. Percent cover estimates of the dominant taxa (or physical characteristics) on Platform Gail also exhibited considerable variability between adjacent legs. Depth of distribution among the dominant taxa was also variable between the two platform legs. **Photo ES-1** shows several of the dominant taxa evident on Platform Gail.



Photo ES-1. (1) *Mytilus* spp., (2) *Metridium senile*, and several (3) *Metridium exilis* at -1 m (-4 ft), Leg B1, Platform Gail.

Platform Grace

This 12-legged platform is located in 97 m (318 ft) of water in the eastern Santa Barbara Channel. Legs C1 and C4 were sampled at Platform Grace. Based on analysis of 150 photographs, 61 total taxa were identified, of which 36 percent (22) were monospecific taxa (i.e., species level identification). Remaining taxa were identified to genus level or higher. Only two floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Ulva lactuca*) were among the 61 total taxa observed. Two undifferentiated assemblages (turf, bryozoa turf) and two physical characteristics (bare metal, line) were also observed at Platform Grace. While mussel harvesting had occurred recently at Platform Grace, cleaned areas were

avoided during photographic sampling. Density-dominant taxa included *Corynactis californica*, *Paracyathus stearnsii*, *Mytilus* spp., and *Ophiothrix spiculata*. Percent cover dominants included *Mytilus* spp., *Corynactis californica*, turf, *Anthopleura elegantissima* (rosy morph), *Metridium senile*, and filamentous red algae.

Platform Grace exhibited well-defined *Mytilus* and *Corynactis* zones, abundant ophiuroids, a prominent barnacle community, and a broadly distributed anthozoan community (*Metridium*, *Corynactis*, *Anthopleura*). Many of the dominant species were also present on most other platforms (e.g., filamentous red algae, *Balanus* spp.). In terms of unique characteristics, Platform Grace exhibited the following trends: (1) prominent *Mytilus* and *Corynactis* communities, with no apparent overlap between the two species; and (2) a prominent *Paracyathus* community beginning in the lower portions of the *Corynactis* community and extending to the base of the platform. **Photo ES-2** shows several of the dominant taxa evident on Platform Grace.

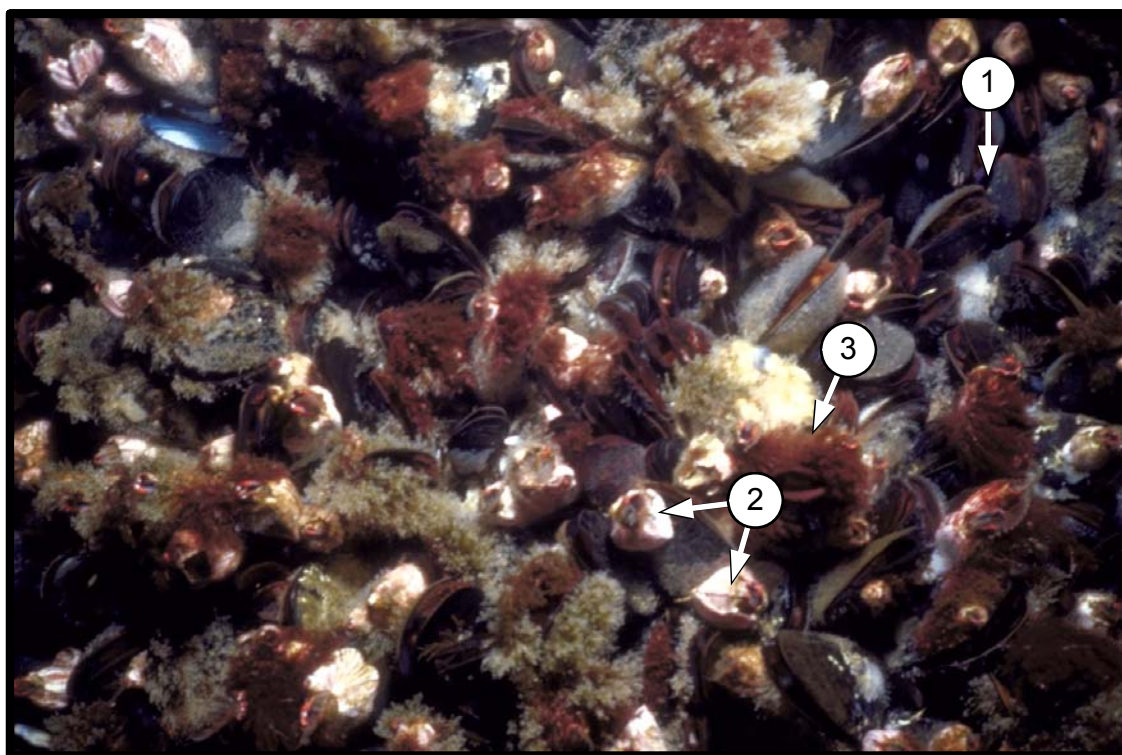


Photo ES-2. (1) *Mytilus* spp., (2) *Balanus* spp., and (3) filamentous red algae at -2 m (-8 ft), Leg C1, Platform Grace.

The top three density-dominant taxa common to both legs on Platform Grace (i.e., *Corynactis californica*, *Paracyathus stearnsii*, and *Mytilus* spp. on Leg C1; *Corynactis californica*, *Mytilus* spp., and *Ophiothrix spiculata* on Leg C4) exhibited moderate between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence. Percent cover estimates of dominant taxa Platform Grace also exhibited moderate variability between adjacent legs. Depth of distribution among the dominant taxa was also variable between the two platform legs.

Platform Harvest

This 10-legged platform is located in 206 m (675 ft) of water in the southern Santa Maria Basin. Legs B1 and B2 were sampled at Platform Harvest. Based on complete analysis of 178 photographs from both legs, 53 taxa were identified, of which 34 percent (18) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with several specimens enumerated at higher taxonomic levels. Only three floral taxa (i.e., foliose red algae; *Egregia*; filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*) were among the 53 total taxa observed. One undifferentiated assemblage (turf) and two physical characteristics (bare metal, line) were also observed at Platform Harvest. There was no indication that recent cleaning activity had occurred at this platform. Density-dominant taxa included *Metridium senile*, an unidentified ophiuroid (probably *Ophiothrix spiculata*), *Mytilus* spp., and *Leucetta*. Percent cover dominants included *Metridium senile*, *Metridium farcimen*, turf, a red encruster, *Leucetta losangelensis*, and *Mytilus* spp. **Photo ES-3** shows several of the dominant taxa evident on Platform Harvest.

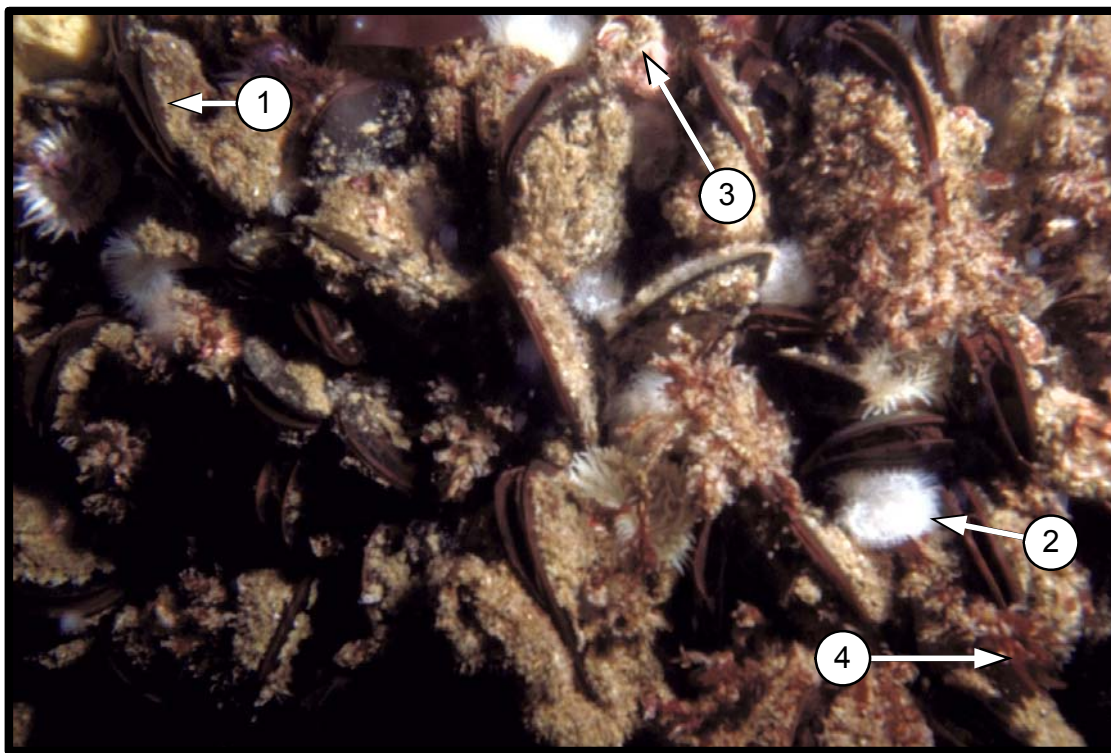


Photo ES-3. (1) *Mytilus* spp., (2) *Metridium senile*, (3) *Balanus* spp., and (4) filamentous red algae at -2 m (-6 ft), Leg B1, Platform Harvest.

The top three density-dominant taxa common to both legs on Platform Harvest (i.e., *Metridium senile*, an unidentified ophiuroid [probably *Ophiothrix spiculata*], and *Mytilus* spp. on Leg B1; *Metridium senile*, an unidentified ophiuroid, and *Leucetta* on Leg B2) exhibited moderate between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence. Percent cover estimates of dominant taxa on Platform Harvest also exhibited considerable variability between adjacent legs.

Platform Hidalgo

This 8-legged platform is located in 131 m (430 ft) of water in the southern Santa Maria Basin. Legs A1 and B1 were sampled at Platform Hidalgo. Based on analysis of 141 photographs, 53 total taxa were identified, of which 37 percent (21) were monospecific taxa (i.e., species level identification). Only four floral taxa (i.e., foliose red algae; *Egregia*; filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Rhodymenia*) were among the 53 total taxa observed. One undifferentiated assemblage (turf) and two physical characteristics (bare metal, fishing line) were also observed. There was no indication that recent cleaning activity had occurred at Platform Hidalgo. Density-dominant taxa included *Metridium senile*, an unidentified ophiuroid, *Mytilus* spp., *Balanus nubilus*, *Metridium farcimen*, *Balanus* spp., and calcareous worm tubes. Percent cover dominants included *Mytilus* spp., *Metridium senile*, *Leucetta losangelensis*, and *Anthopleura elegantissima* (rosy morph). **Photo ES-4** shows *Mytilus* spp. and associated fauna present on Platform Hidalgo.



Photo ES-4. (1) *Mytilus* spp. and associated fauna at -2 m (-6 ft), Leg B1, Platform Hidalgo.

The top three density-dominant taxa common to both legs on Platform Hidalgo (i.e., *Metridium senile*, an unidentified ophiuroid, and *Mytilus* spp. on Leg A1; *Metridium senile*, *Mytilus* spp., and an unidentified ophiuroid on Leg B1) exhibited moderate between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence. Percent cover estimates of dominant taxa on Platform Hidalgo also exhibited considerable variability between adjacent legs.

Comparisons of Adjacent Legs – Summary

Among the four primary platforms sampled, there were varying numbers of common and unique dominant and subdominant taxa present on adjacent legs. When the top 12 density-dominant taxa were considered, relatively high numbers of co-occurring dominants were evident at platforms Harvest and Gail, followed by Hidalgo and Grace. In all cases, the numbers of dominant taxa unique to a particular platform leg ranged from zero to two, suggesting a relatively strong similarity in community composition between adjacent platform legs. Two taxa, *Metridium senile* and *Mytilus* spp., were noted numerical dominants on all of the primary platform legs. Other dominant taxa which were consistently common to adjacent platform legs included *Balanus* spp., *Ophiothrix spiculata* or unidentified ophiuroids, and calcareous worm tubes. Turf, representing an aggregation of smaller flora and fauna (including protozoa, hydrozoa, bryozoa, and algae) that co-occur with one another, was included among the density co-dominants on three of the four primary platforms, while bare metal co-occurred on all adjacent legs and was a dominant feature on platforms Harvest and Hidalgo.

In terms of percent cover, there were interesting differences evident between adjacent platform legs. On Platform Gail, *Corynactis californica*, *Metridium exilis*, and *Mytilus* spp. contributions to percent cover were significantly different between the legs sampled, while contributions from bare metal and *Metridium senile* increased accordingly. On Platform Grace, percent cover estimates of dominant taxa exhibited moderate variability between adjacent legs. Percent cover contributions from *Mytilus* spp., turf, and filamentous red algae were comparable between the two legs sampled, while those from *Corynactis californica* were considerably different.

On Platform Harvest, percent cover dominants *Metridium senile* and turf exhibited similar contributions between legs, while significant variability was evident between legs for the red encruster, *Mytilus* spp., and *Leucetta losangelensis*. On Platform Hidalgo, moderate variability in percent cover dominants was evident between adjacent legs. Contributions from *Mytilus* spp., *Metridium senile*, and *Leucetta losangelensis* were similar between legs, while those from *Corynactis californica* and *Anthopleura elegantissima* (rosy morph) were noticeably different.

There were several other interesting observations which resulted from a comparison of adjacent legs. *Corynactis californica* and *Anthopleura elegantissima* (rosy morph) were normally present on the adjacent legs of primary platforms, however, *Corynactis* was noticeably and completely absent from Leg B1 of Platform Hidalgo and *A. elegantissima* (rosy morph) was absent from Leg A1 of Platform Hidalgo and Leg B1 of Platform Gail.

Platform Habitat

This 8-legged platform is located in 88 m (290 ft) of water in the central Santa Barbara Channel. Leg A1 was sampled at Platform Habitat. Based on complete analysis of 70 photographs, 42 taxa were identified, of which 36 percent (15) were monospecific taxa (i.e., species level identification). Only three floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.; the coralline alga *Corallina*; *Ulva*) were among the 42 total taxa observed. One undifferentiated assemblage (turf) and one physical characteristic

(bare metal) were also observed. There was no indication that recent cleaning activity had occurred at Platform Habitat.

Density-dominant taxa included *Corynactis californica*, *Mytilus* spp., *Metridium senile*, *Ophiothrix spiculata*, *Balanus nubilus*, and the rosy morph form of *Anthopleura elegantissima*. Dominant taxa in terms of percent cover included *Corynactis californica*, *Mytilus* spp., a zoanthid (*Palythoa*), the rosy morph form of *Anthopleura elegantissima*, and filamentous red algae. In terms of unique characteristics, Platform Habitat exhibited the following: (1) an intermittent *Mytilus* zone; (2) a broadly distributed anthozoan community (*Metridium*, *Corynactis*, *Anthopleura*); and (3) dense aggregations of an unidentified zoanthid. **Photo ES-5** shows several of the dominant taxa evident on Platform Habitat.



Photo ES-5. (1) *Mytilus* spp., (2) *Metridium senile*, (3) *Balanus* spp., and (4) *Ophiothrix spiculata* at -4 m (-13 ft), Leg A1, Platform Habitat.

Platform Irene

This 8-legged platform is located in 74 m (242 ft) of water in the southern Santa Maria Basin. Leg A1 was sampled at Platform Irene. Based on complete analysis of 64 photographs, 39 taxa were identified, of which nearly 41 percent (16) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with a few specimens enumerated at higher taxonomic levels. Only four floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.; a small red foliose alga, a green encrusting alga; *Ulva*) were among the 39 total taxa observed. One undifferentiated assemblage (turf) and one physical characteristic (bare metal) were also observed. There was no indication that recent cleaning activity had occurred at Platform Irene.

Dominant taxa, based on total density, included *Metridium senile*, *Mytilus californianus*, *Tetraclita squamosa*, *Balanus* spp., *Anthopleura elegantissima* (rosy morph), and calcareous worm tubes. In terms of percent cover, prevalent species included *Metridium senile*, *Mytilus californianus*, *Tetraclita squamosa*, and three encrusting sponge species (i.e., gray encrusting, tan encrusting, and yellow encrusting). **Photo ES-6** shows several of the dominant taxa evident on Platform Irene.



Photo ES-6. (1) *Mytilus californianus*, (2) *Metridium senile*, (3) *Anthopleura elegantissima* (rosy morph), and (4) *Pisaster ochraceus* at -9 m (-31 ft), Leg A1, Platform Irene.

Diablo and Nifty Rocks

These two natural rock outcrops are located offshore of the northern Channel Islands. Diablo Rock is several kilometers to the west of Diablo Point, off the northern coastline of Santa Cruz Island, within the waters of the western Santa Barbara Channel; water depths at the base of this feature are approximately 33 m (108 ft). Nifty Rock is several kilometers east-southeast of Harris Point, off the northwestern point of San Miguel Island; water depths at the foot of this rock outcrop are approximately 15 m (50 ft). Forty-four taxa were identified from the photographic analysis of 22 photographs acquired at Diablo and Nifty Rocks. Fourteen of these taxa were monospecific (i.e., species level identification). Of the 44 taxa present, 24 taxa were unique to the rock outcrops (i.e., 20 taxa common to both the rock outcrops and the platforms). Seven floral taxa (i.e., filamentous red algae, *Bossiella* spp., an encrusting alga [*Lithothamnion*], two different green clump algal types [one of which was *Codium*-like], an unidentified brown alga, and a brown clump alga) were among the 44 total taxa observed. Density-dominant taxa included *Corynactis californica*, *Chthalamus* spp., *Balanus* spp., *Anthopleura xanthogrammica*,

Ophiothrix spiculata, and *Mytilus californianus*. Percent cover dominants included *Corynactis californica*, filamentous red algae, encrusting green alga (*Lithothamnion*), *Chthalamus* spp., turf, and a composite of encrusters. **Photo ES-7** shows several of the dominant taxa evident at Diablo Rock.

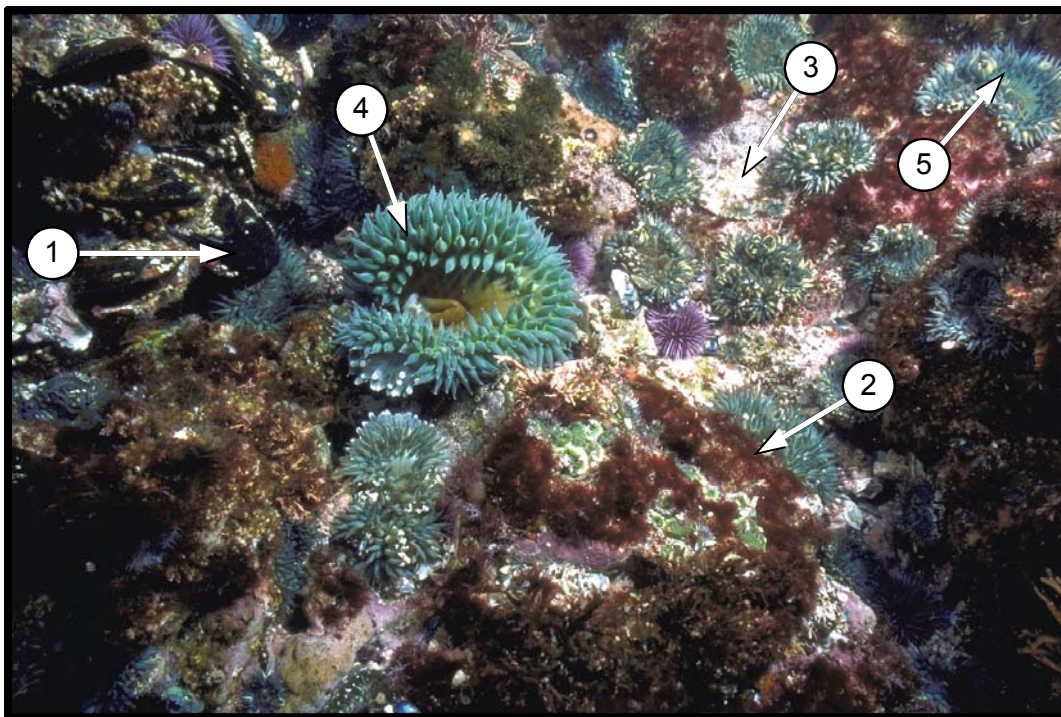


Photo ES-7. (1) *Mytilus californianus*, (2) filamentous red algae, (3) an encrusting alga (*Lithothamnion*), (4) *Anthopleura xanthogrammica*, and (5) *A. elegantissima* at -8 m (-25 ft), Diablo Rock.

Comparisons Between Platforms

Combining dominant taxa from both density and percent cover determinations into a composite listing produced 60 taxa, undifferentiated assemblages (i.e., turf, bryozoa turf), and physical characteristics (e.g., bare metal). A comparison of average rankings (i.e., density vs. percent cover) for the dominant taxa at all platforms is provided in **Table ES-4**.

Thirty-four numerically dominant species or taxa were present on one or more of the six platforms evaluated. Two taxa, *Metridium senile* and *Mytilus* spp., were identified as numerical dominants on all ten platform legs evaluated. Four other taxa – *Balanus* spp., calcareous worm tubes, turf, and a yellow encrusting sponge – were either density-dominants or present (as sub-dominants) on all ten platform legs. *Corynactis californica* and *Anthopleura elegantissima* (rosy morph) were present on nine of the ten legs as dominant taxa, while *Balanus nubilus* and bare metal were either dominants or present on nine of the platform legs. Other taxa present on a majority of the platform legs included unidentified ophiuroids, *Ophiothrix spiculata*, *Metridium farcimen*, filamentous red algae, *Leucetta/Leucetta losangelensis*, *Paracyathus stearnsii*, and plain worm tubes.

Table ES-4. Comparison of average rankings - density vs. percent cover - for the dominant taxa, all platforms.

Taxon	Density	Percent Cover	Frequency (%)	Taxon	Density	Percent Cover	Frequency (%)
<i>Metridium senile</i>	2.90	3.33	100	Zoanthid, colonial tan	ND	5.00	30
<i>Mytilus</i> spp.	3.80	2.78	100	<i>Tetraclita squamosa</i>	8.00	3.00	30
<i>Balanus</i> spp.	6.00	ND	100	<i>Coenocyathus bowersi</i>	9.00	ND	30
Worm tubes, calcareous	8.00	6.00	100	<i>Metridium</i> spp.	9.00	ND	30
Turf	9.29	7.00	100	Tunicate, encrusting translucent	10.00	ND	30
Sponge, tan encrusting	ND	9.00	100	Sponge, cup tan	ND	10.00	30
Bare Metal	11.50	7.88	100	Zoanthid, tan (<i>Palythoa</i>)	ND	12.00	30
Sponge, yellow encrusting	11.00	10.25	100	Sponge, orange encrusting	ND	12.00	30
<i>Corynactis californica</i>	2.89	4.00	90	<i>Desmophyllum dianthus</i>	6.50	ND	20
Ophiuroid, unidentified	3.80	ND	90	<i>Protula superba</i>	10.00	ND	20
<i>Balanus nubilus</i>	8.00	ND	90	Zoanthid (<i>Palythoa</i>)	ND	3.00	20
Encruster, yellow	ND	8.00	90	Hydroid, tan	ND	5.50	20
<i>Anthopleura elegantissima</i> (rm)	6.25	6.57	80	Sponge, tan foliose	ND	6.00	20
<i>Ophiothrix spiculata</i>	5.86	7.00	70	Tunicate, tan encrusting	ND	6.50	20
<i>Metridium farcimen</i>	8.00	5.33	70	Sponge, gray encrusting	ND	7.50	20
Filamentous red algae	8.20	6.00	70	Encruster, lavender	ND	7.50	20
Foliose red algae	ND	11.00	70	Encruster, blue	ND	9.00	20
<i>Leucetta/Leucetta losangelensis</i>	7.50	5.60	60	Alga, encrusting green	ND	9.00	20
Encruster, tan	ND	8.67	60	<i>Ulva</i> spp.	ND	12.00	20
Hydroid, tan branching	ND	9.00	60	<i>Halichondria panicea</i>	ND	4.00	10
<i>Paracyathus stearnsii</i>	5.00	10.00	60	Bryozoa turf	ND	7.00	10
Sponge, white encrusting	ND	11.00	60	<i>Cliona</i> spp., yellow	ND	8.00	10
Worm tubes, plain	11.50	ND	60	<i>Triopha catalinae</i>	8.00	ND	10
<i>Pollicipes polymerus</i>	12.00	ND	50	<i>Botrylloides</i> spp.	ND	8.00	10
<i>Eudistylia polymorpha</i>	9.00	ND	40	Sponge, tan globose	ND	9.00	10
Encruster, red	11.50	4.00	40	Anthozoa, unidentified	ND	9.00	10
<i>Pisaster ochraceus</i>	12.00	ND	40	<i>Anthopleura</i> spp. (whitish, no rose)	10.00	ND	10
Bryozoa, tan branching	ND	11.00	40	<i>Corallina</i> spp.	10.00	ND	10
<i>Metridium exilis</i>	3.67	3.50	30	<i>Staurocalyptus</i> sp.	11.00	ND	10
<i>Mytilus californianus</i>	4.50	5.00	30	<i>Amphipholis</i> spp.	12.00	ND	10

Note: ND = not determined; rm = rosy morph.

While a number of density-dominant taxa were present at all platforms, considerable variability was evident among platform sub-dominants. For example, *Metridium exilis* at Platform Gail and *Desmophyllum* (*Desmophyllum dianthus*) at Platform Gail were among the platform's numerical dominants, yet were either extremely limited or not evident at the remaining platforms. *Metridium exilis* only occurred elsewhere on a single platform leg – Platform Grace, Leg C4 (i.e., this species was not encountered at the remaining four platforms). *Desmophyllum*, the sixth or seventh most abundant species (by density) at Platform Gail, was not encountered at any of the other platforms sampled.

Other dominant taxa that occurred exclusively at the southern platforms (i.e., Gail, Grace, Habitat) included the brittlestar *Amphipholis*, coralline alga (*Corallina*), the sponge *Staurocalyptus*, and the nudibranch *Triopha catalinae*. Similarly, several species were absent from platforms in the eastern Santa Barbara Channel (i.e., Grace, Gail), but nearly always present on those in the Santa Maria Basin (i.e., Harvest, Hidalgo, Irene), including the gooseneck barnacle *Pollicipes polymerus*, a red encruster, and the starfish *Pisaster ochraceus*.

In terms of percent cover, forty dominant species, taxa, or physical characteristics were noted. Six taxa (or undifferentiated “assemblages” such as turf) were present on all ten platform legs. *Metridium senile* and turf were percent cover dominants on all ten platform legs. Tan encrusting and yellow encrusting sponges and calcareous worm tubes were dominants or sub-dominants on all ten platform legs evaluated. *Mytilus* spp. was a major contributor to percent cover on nine of the ten legs evaluated. While percent cover estimates for *Mytilus* spp. were not determined on Platform Irene, *Mytilus californianus* was recognized as a dominant contributor to percent cover on Irene, indicating that mussels were percent cover dominants on all platform legs. *Corynactis californica* and *Anthopleura elegantissima* (rosy morph) were percent cover dominants or sub-dominants on eight legs and present (but coverage not determined) on another leg, for a total of nine platform legs. *Corynactis* was absent from a single leg on Platform Hidalgo, while *Anthopleura* was absent from a single leg on Platform Gail.

Bare metal was also a percent cover dominant or sub-dominant, as a physical characteristic, on nine of the platform legs, being absent from Platform Irene. Other taxa which were contributors to percent cover on a majority of the platform legs included a yellow encruster, *Ophiothrix spiculata*, filamentous red algae, a white encrusting sponge, *Metridium farcimen*, foliose red algae, a tan encruster, *Leucetta/Leucetta losangelensis*, a tan branching hydroid, and *Paracyathus stearnsii*.

For many of the taxa, the average density and average percent cover rank determinations were comparable, particularly for the most frequently observed species (e.g., *Metridium senile*; *Mytilus* spp.; calcareous worm tubes; *Corynactis californica*; *Anthopleura elegantissima* [rosy morph]). This comparability underscores the fact that these species were not only present at all of the platforms, but present as dominant taxa in terms of individual counts and/or percent cover. Further, individual counts and percent cover estimators are viable mechanisms, both separately and jointly, in determining relative importance of a species to platform community structure.

Among the numerically dominant (i.e., density-dominant) taxa, cnidarians (i.e., *Metridium senile*, *Anthopleura elegantissima* (rosy morph), *Corynactis californica*), mussels (i.e., *Mytilus californianus*; *Mytilus* spp. complex), barnacles (i.e., *Balanus nubilus*, *Balanus* spp., *Tetraclita squamosa*), worm tubes (calcareous and plain), and ophiuroids (*Ophiothrix spiculata*; ophiuroids, unidentified) represented the most prominent and consistent community-formers present on the platforms studied. Several of the density-dominant taxa were also noted as significant fauna elements when percent cover was determined. The major taxa, undifferentiated assemblages, or physical characteristics evaluated for percent cover (i.e., coverage-dominant) included cnidarians (i.e., *Metridium senile*, *Anthopleura elegantissima* [rosy morph], *Corynactis californica*; *Metridium farcimen*), mussels (i.e., *Mytilus californianus*; *Mytilus* spp. complex), turf, calcareous worm tubes, sponges (tan encrusting, yellow encrusting, *Leucetta/Leucetta losangelensis*), bare metal, encrusters (yellow), ophiuroids (*Ophiothrix spiculata*), and algae (filamentous red algae, foliose red algae). These taxa represented the most prominent and consistent community-formers present on the platforms studied.

Major findings pertinent to dominant platform-associated taxa included the following:

- *Metridium senile* – the highest ranked species observed overall, a numerical (density) dominant of platforms Harvest, Hidalgo, and Irene, and ranking within the top four at platforms Gail, Grace, and Habitat. Average densities ranged from 10.8 to 330.9 individuals/0.0625 m² (maximum: 510 individuals/0.0625 m² at Platform Irene) and average coverage ranged from 3.7 to 66.0 percent (maximum: 98 percent at Platform Irene). This species exhibited a wide depth distribution and was found at nearly all depths of a platform.
- *Mytilus* spp. – the second highest ranked species observed and the most prominent taxon between the intertidal and the upper few tens of meters of a platform leg. *Mytilus* spp. or *Mytilus californianus* consistently ranked in the top six among density dominants, and usually was the second or third most abundant taxa (by density) at the platforms sampled. Average densities ranged from 24.3 to 117.8 individuals /0.0625 m² (maximum: 240 individuals/0.0625 m² at Platform Grace) and average coverage ranged from 19.2 to 60.4 percent (maximum: 100 percent at Platform Habitat). Mussels typically occurred in a depth range that extended from the intertidal to 12 to 24 m (40 to 80 ft).
- Barnacles, represented by *Balanus* spp., *Balanus nubilus*, and, to a lesser extent by *Tetraclita squamosa*, ranked third in total density among platform-associated taxa. Average densities ranged from 2.5 to 42.0 individuals/0.0625 m² (maximum: 200 individuals/0.0625 m² at Platform Irene). The predominant depth range for barnacles was within the upper portions of the platform leg (i.e., usually from the intertidal to approximately 18 m [60 ft]), although barnacles were found extending deeper at platforms Grace, Harvest, Hidalgo, Habitat, and Irene.
- Worm tubes, including both calcareous and plain forms, jointly ranked fourth in total density among platform-associated taxa. Average densities for calcareous worm tubes ranged from 1.0 to 51.5 individuals/0.0625 m² (maximum: 100 individuals/0.0625 m² at Platform Irene). The predominant depth range for worm tubes, whether calcareous or plain, was below approximately 46 m (150 ft). Maximum depth of occurrence for worm tubes was 213 m (700 ft).

- Two forms of encrusting sponge – yellow encrusting and tan encrusting – were present (along with all of the taxa noted above) on all platform legs sampled. Yellow encrusting sponge exhibited average cover ranging from 0.5 to 16.1 percent (maximum: 70 percent at Platform Harvest), while tan encrusting sponge exhibited average cover ranging from 4.0 to 32.4 percent (maximum: 60 percent at Platform Irene).

Bare metal was also present on all ten platform legs, primarily at depth, with average cover ranging from 7.5 to 49.2 percent; this physical characteristic was noticeably reduced at Platform Irene, present in only a few photographs near the base of the platform.

Other prominent platform-associated taxa included the anthozoan anemones *Corynactis californica* and *Anthopleura elegantissima* who ranked fifth and sixth in total density among density-dominant species, respectively. *Corynactis californica* exhibited a rather broad depth distribution, typically between approximately 15 and 61 m (50 and 200 ft), although *Corynactis* was observed at deeper depths (e.g., >91 m [300 ft] at Platform Gail; >61 m [200 ft] at Platform Habitat). The rosy morph form of *Anthopleura elegantissima* exhibited a very restricted depth range, occurring primarily in the upper 1 to 14 m (3 to 45 ft) of each submerged platform leg (i.e., with the intertidal, barnacle, and *Mytilus* zones).

Ophiuroids, as represented by *Ophiothrix spiculata* or unidentified ophiuroids, were also prevalent on the platforms and were ranked seventh in total density among the dominant species. Ophiuroid dominance at each platform varied, ranging in density-based ranking from second to tenth. Highest average densities of *Ophiothrix spiculata* or unidentified ophiuroids were observed at Platform Hidalgo, while lowest average densities were evident at platforms Irene, Habitat, and Gail. Ophiuroids exhibited a wide depth distribution and were found at nearly all depths of a platform, in similar fashion to *Metridium senile*.

Comparison of Platforms and Natural Rock Outcrops

Results of the quantitative slide analysis of photographs from Diablo and Nifty Rocks resulted in the identification of 44 taxa. There were several taxa found to be dominant on both natural outcrops and platforms (i.e., *Ophiothrix spiculata*, *Mytilus californianus*, *Corynactis californica*, and *Metridium senile*; filamentous red algae). However, twenty-four of the taxa identified at Diablo and Nifty Rocks were not observed on the platforms. In spite of the restricted scope of photographic sampling conducted at Diablo and Nifty Rocks, it is suggested that species diversity at the natural rock outcroppings was higher than that seen in comparable depth zones at the six platforms, particularly for algal species which, by comparison, were under-represented on the platforms.

Previous regional characterizations of California's hard bottom fauna offer insight into the community composition of hard bottom features found at depth (e.g., low to high relief rock outcrops, generally 1 to 3+ m above the seafloor, at various water depths). The 30 most frequently encountered megabenthic taxa occurring on hard substrate in the western Santa Barbara Channel and Santa Maria Basin were represented by five phyla – Porifera (sponges), Cnidaria (anthozoans), decapod crustaceans, brachiopods, and echinoderms (i.e., crinoids, holothuroids, echinoids/urchins, asteroids/sea stars, and ophiuroids). Thirteen of the

30 natural hard bottom megafauna taxa also occur on the platforms, however, nearly half of these taxa occurred only once (i.e., sole occurrence on a single platform). Most frequently encountered species include *Metridium farcimen* and a tan zoanthid. The zoanthid depth distribution was across the entire platform leg depth. *M. farcimen* depth distribution was more restricted. For a limited number of species which occur at both platforms and hard bottom features (e.g., *Galathea californiensis*), respective depth distributions were similar. Depth distribution for other species was confounding and no apparent trends were evident.

Statistical Analysis of Photographic Data

Platform Leg Comparisons

Results of the clustering analysis using the density data sets indicated greatest similarity between (1) adjacent legs on Platform Harvest; (2) adjacent legs on Platform Hidalgo; and (3) Platform Gail (Leg A1) and Platform Grace (Leg C4). While similarity between adjacent legs on the same platform might be expected, the high level of similarity between Grace and Gail was not. While Grace and Gail are both located in the eastern Santa Barbara Channel, there are significant water depth differences and corresponding differences in the total number of biotic zones between the two platforms. The process of combining data along a platform leg effectively eliminated any biotic zone bias that might be introduced and allowed for a direct comparison of flora and fauna between legs. In this instance, it appeared that the relative contribution of fauna from the lower zone of Gail had minor effect on clustering; the strong similarities evident were attributed to geographic proximity. Support for this hypothesis was also evident in subsequent groupings, where the Santa Barbara Channel platforms (Habitat-Grace-Gail) exhibited similarity with one another and the Santa Maria Basin platforms (Harvest-Hidalgo-Irene) exhibited similarity with one another. The inconsistent element in the clustering results rested with Platform Gail (Leg B1), which showed similarity with Harvest-Hidalgo-Irene. No obvious explanation was available to explain this clustering result.

Results of the clustering analysis using percent cover data were very similar to those shown by the count data and strongly supported similarities between adjacent legs. Greatest similarities, in descending order, were evident between adjacent legs on all primary platforms – Harvest, Hidalgo, Gail, and Grace. The secondary platforms grouped according to geographic location: Habitat grouped with Grace, while Irene grouped with the Hidalgo-Harvest grouping.

Biotic Zone Comparisons

Results of clustering analysis using density data indicated strongest similarities between (1) Platform Irene (Leg A1) *Mytilus* and *Corynactis* zones; (2) Platform Harvest (Legs B1 and B2) *Metridium*/sea star zones; and (3) Platform Hidalgo (Leg B1) intertidal and *Mytilus* zones. The top down analysis of density clustering results produced three groupings which generally reflected community water depth. Results of clustering analysis using percent cover data, while producing associations which were not identical to those noted with the count data, did identify strong similarities between adjacent zones of the same platform leg or the same zones between adjacent legs. The top down analysis of percent cover clustering results produced four groupings. In general, with minor exception, similarity groupings (based on count or percent cover biotic zone data resulting from whole slide analysis) tended to occur between adjacent

zones of the same platform leg (e.g., intertidal and *Mytilus*) or the same zones between adjacent legs. These results suggested that there was (1) a strong similarity between biota of adjacent platform legs, and (2) a gradual shift in community structure with increasing depth along a platform leg. Further, the boundaries of each biotic zone are not tied strictly to water depth.

PointCount'99® Analysis

The first clustering analysis of PointCount'99® data determined similarities between platform legs, with greatest similarities evident between (1) adjacent legs on Platform Harvest; and (2) adjacent legs on Platform Hidalgo. The second clustering determined the similarities between biotic zones, with greatest similarities evident between (1) Platform Irene *Mytilus* and *Corynactis* zones; (2) Platform Gail barnacle/scallop and Platform Grace barnacle/scallop zones; (3) Platform Harvest anemone/encruster and Platform Hidalgo sponges/encruster zones; and (4) Platform Hidalgo intertidal zones.

The top down analysis of the PointCount'99® biotic zone data sets resulted in the identification of four groupings. The first grouping, comprised of select intertidal and *Mytilus* communities from the six platforms, suggested a similarity between intertidal and *Mytilus* zones, regardless of geographic location. The second grouping, comprised primarily of *Corynactis* and various encrusters, suggested similarity between the zones present in intermediate water depths of select platforms, most of which are characterized by the presence of encrusters, regardless of geographic location. The third grouping, consisting of *Mytilus* and barnacle zones along with other zones, suggested similarity of biotic zones across a depth range for the northern platforms, and indicated that several taxa (e.g., *Metridium senile*, *Leucetta*) that were widely distributed down a platform leg produced a biotic continuum which countered the concept of distinct biotic zones. The fourth grouping, comprised of remaining intertidal, *Mytilus*, barnacle/scallop, and vase sponge/encruster communities, also suggested the presence of a biotic continuum, with several species present (and often dominant) in adjacent biotic zones (e.g., *Ophiothrix spiculata*, *Metridium senile*, barnacles, *Corynactis californica*).

PointCount'99® vs. QSA

Eighty-one percent of the taxa identified during point count analyses (PointCount'99®) were also identified as percent cover dominants during whole or quantitative slide analysis (QSA). Overall, rankings of QSA percent cover dominants were very consistent with PointCount'99® results. Typically, the top dominants on each platform leg were noted accordingly, although shuffling of position between top dominants was evident between the two analytical approaches. Such reshuffling of dominant taxa was not unexpected, given the differences between comparison parameters (i.e., 50 random points vs. whole slide analysis).

At least one species of interest was potentially under represented in the point count approach - mussels. *Mytilus* spp. on Platform Gail averaged only 24.9 percent cover via the point count method, while QSA results averaged 60.4 percent, a level considered to be more representative. Under representation of mussels was also evident at platforms Grace and Hidalgo, and, to a lesser extent, at Platform Harvest. *Mytilus* coverage estimates at the remaining platform were comparable. Under representation was not evident with other dominant taxa.

Diablo and Nifty Rocks and Comparable Platform Zones

The last set of clustering analyses employed QSA data to determine the similarities between epibiota of natural rock outcrops and platform legs within similar water depths using density (i.e., count) and percent cover data sets. Results of clustering analysis using count data, comparing platform biota to natural outcrop communities in the 5 to 17 m depth range, indicated greatest similarities between (1) Platform Hidalgo and Platform Irene; (2) Platform Grace and Diablo Rock; and (3) Platform Harvest. Results of the clustering analysis using percent cover data revealed greatest similarities for (1) Platform Hidalgo and Platform Irene; (2) Platform Grace with the Hidalgo-Irene group; and (3) Platform Harvest with the Grace-Hidalgo-Irene group. Diablo Rock exhibited closest affinity to the Harvest-Grace-Hidalgo-Irene group, while Nifty Rock showed greatest similarity with Platform Grace. Aside from the Hidalgo-Irene grouping, none of the percent cover similarities were evident in the earlier count data comparisons. No readily discernable trends were evident.

Depth Distribution of Platform-Associated Biota

In general, the biotic zones determined from videotape analysis were confirmed through the photographic analysis. Mussel zones were always present, although their vertical extent may have differed from those estimated from the videotapes alone. Mussel zones extended to depths of 16 m (52 ft), with only limited presence below that depth (maximum depth: 24 m; 79 ft). *Mytilus* typically co-occurred with several taxa, including (1) algae, with filamentous and foliose red algae predominating, extending to depths of 17 to 20 m (55 to 65 ft); barnacles, with *Balanus nubilus* and *Balanus* spp. predominant; and (3) several anemone species, including *Anthopleura elegantissima* (rosy morph) and *Metridium senile*. Ophiuroids were also present within the mussel zone, but typically in the mid to lower portions of the *Mytilus* zone, perhaps to avoid stronger surge present closer to the surface.

Dominant species or taxa found at intermediate depths and beyond were generally, but not always, consistent with the biotic zone designations. These findings may be related to the broad categories used in the videotape analysis (e.g., encrusters), may reflect differences inherent in comparing data sets acquired at different spatial scales, or may be attributed to changes in community composition over time. Overall, it was evident that there was considerable overlap in the depth distributions of major taxa (i.e., density- and percent cover dominants).

Graphic representations of the generalized depth distribution of dominant species present at each platform are provided in **Figures ES-2** through **ES-4**. These figures present generalized depth distribution patterns, based on random sampling between the intertidal and base of one or two platform legs. General depth distribution and patterns of occurrence for the most prevalent platform-associated species are depicted graphically in **Figure ES-5**.

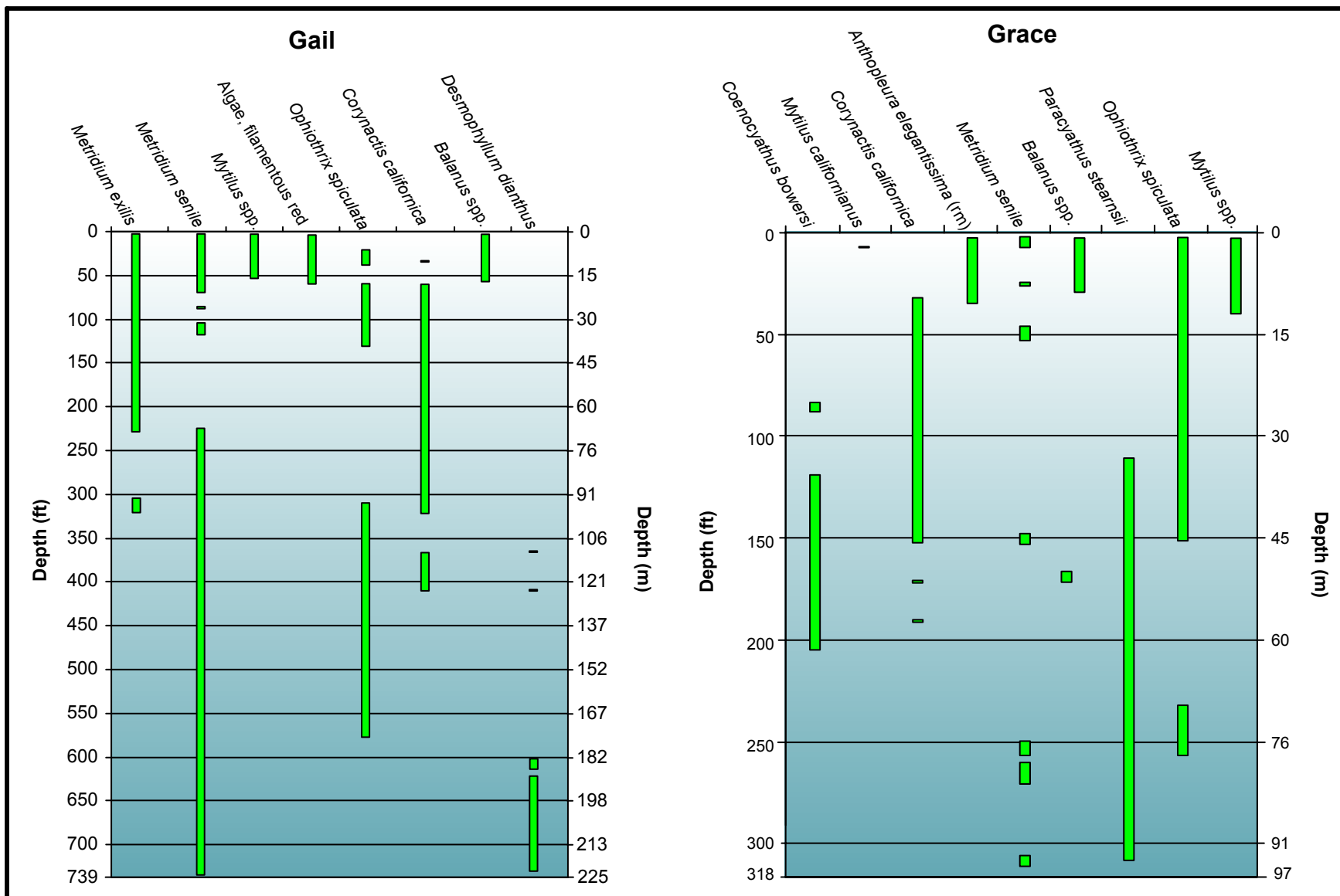


Figure ES-2. Generalized depth distribution of dominant species present at platforms Gail and Grace.

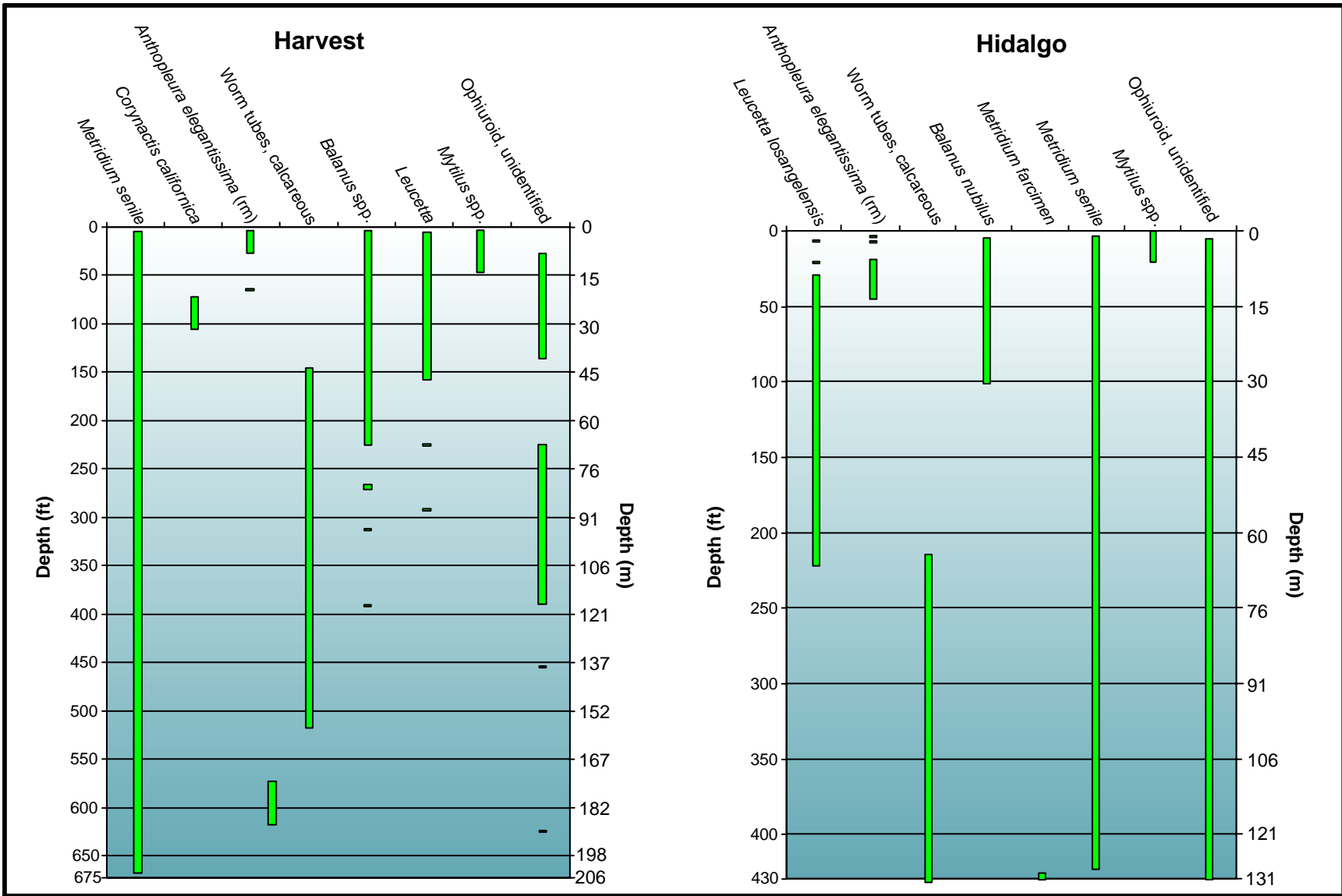


Figure ES-3. Generalized depth distribution of dominant species present at platforms Harvest and Hidalgo.

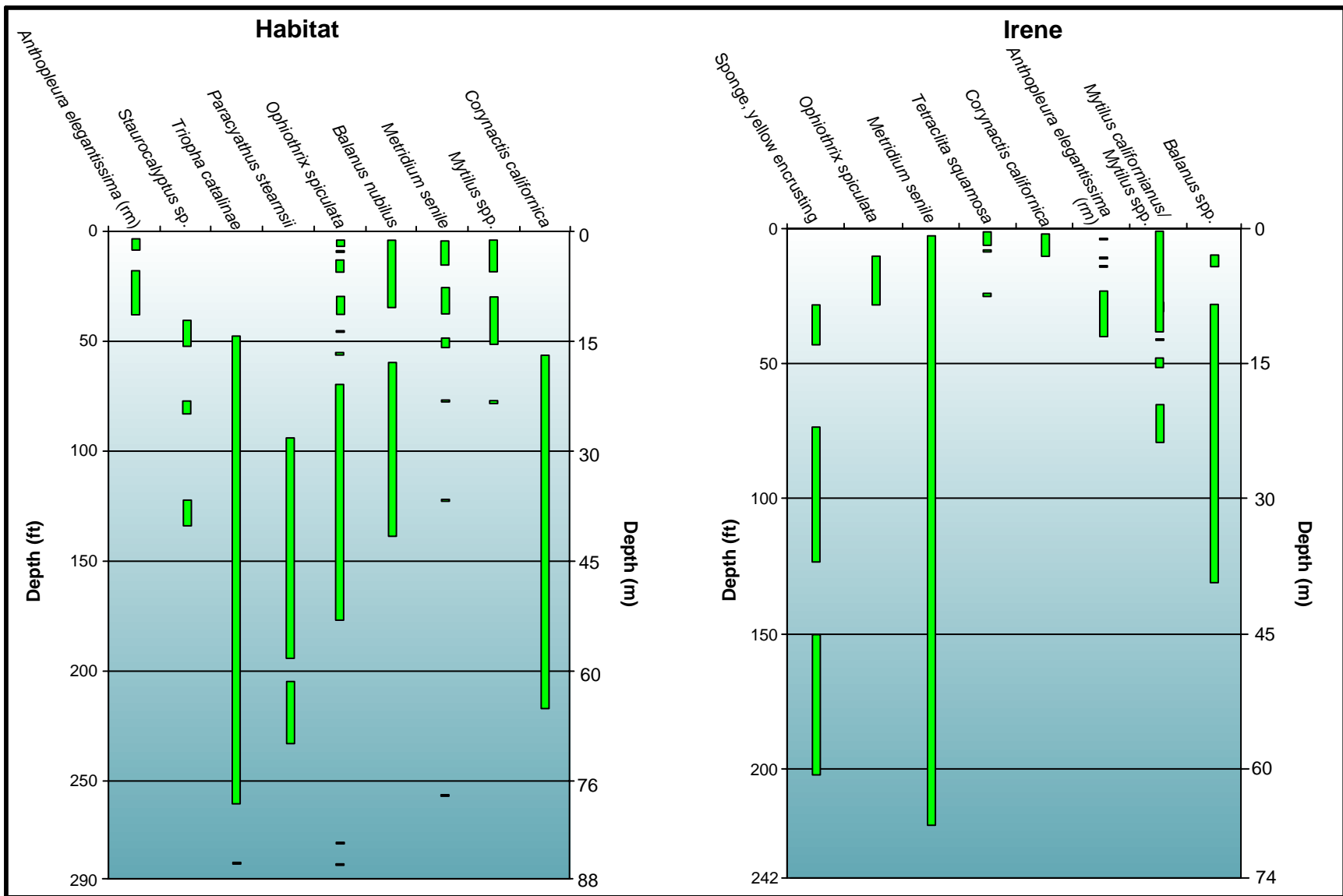


Figure ES-4. Generalized depth distribution of dominant species present at platforms Habitat and Irene.

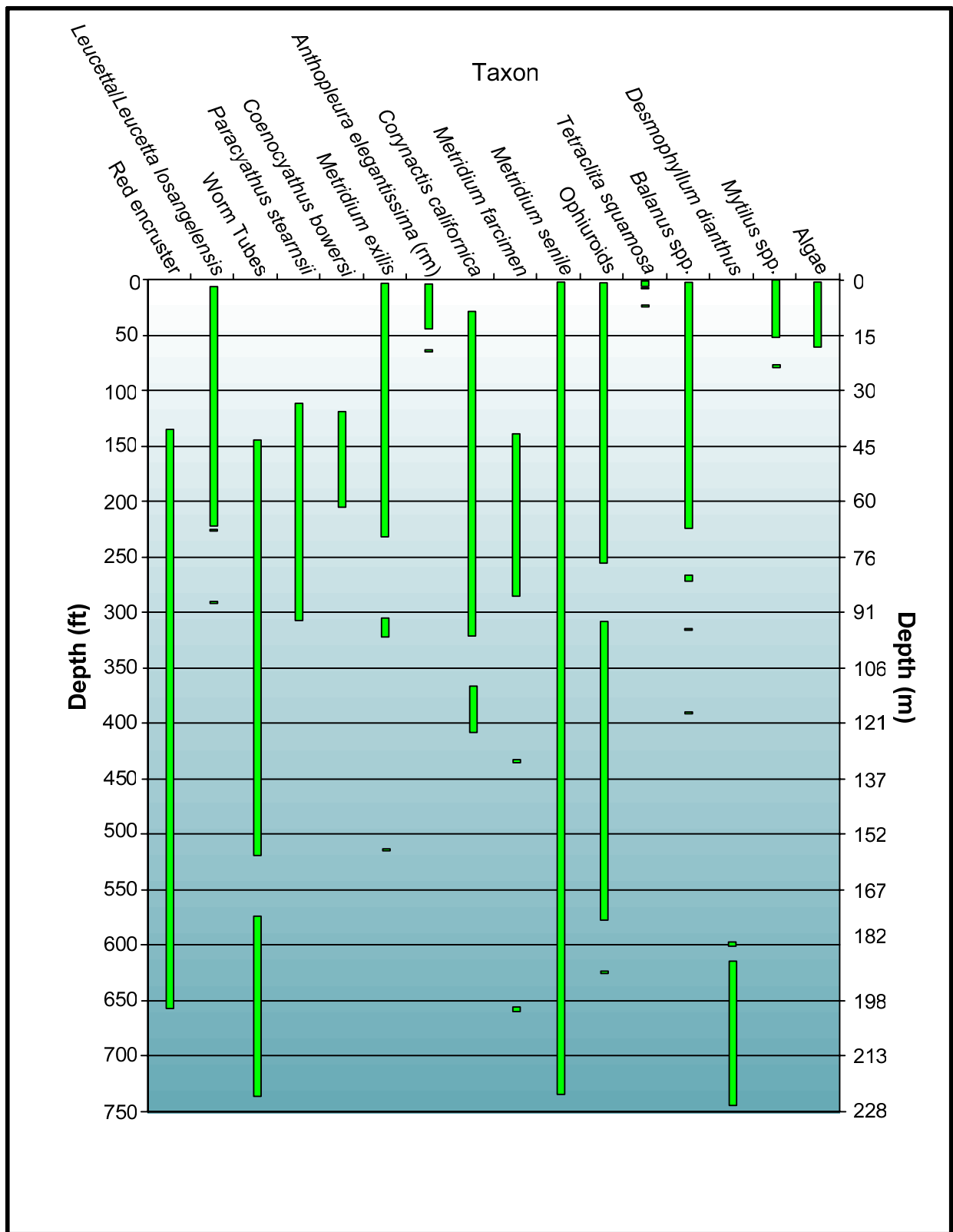


Figure ES-5. Generalized depth distribution of select biota - all platforms.

In general terms, the zonation patterns of all California platforms may include:

- an *upper zone* (from the intertidal to 18 to 26 m [60 to 85 ft]), including the intertidal and mussel bed, and consisting of *Mytilus* spp., various algae (e.g., filamentous and foliose red algae, several green algal species such as *Ulva*), barnacles, several anemone species (e.g., *Anthopleura elegantissima*, *Metridium senile*), sponges, and ophiuroids;
- a *mid zone* (from 19 to 26 m [65 to 85 ft] to about 76 m [250 ft]), including *Corynactis californica*, ophiuroids, barnacles, *Metridium senile*, *Leucetta/Leucetta losangelensis*, and worm tubes; and
- a *lower zone* (below 76 m [250 ft]), including *Metridium senile*, *M. farcimen*, *Paracyathus stearnsii*, turf, and worm tubes. Platform- or platform group-specific taxa may also be present in the lower zone (e.g., *Desmophyllum dianthus* only at Platform Gail; red encruster only at platforms Harvest, Hidalgo, and Irene).

Scraping Analysis - Taxonomic Identification

A total of 23 scraping samples were collected from Platform Harvest – four samples from the barnacle zone and eight samples from the *Mytilus* zone of Leg B1; three samples from the barnacle zone and eight samples from the *Mytilus* zone of Leg B2. Depth of collection on Platform Harvest ranged from 3.4 to 24.1 m (11 to 79 ft). A total of 31 scraping samples were collected from Platform Gail – five samples from the intertidal zone, six samples from the barnacle/scallop zone, and six samples from the *Mytilus* zone of Leg A1; three samples from the intertidal zone, two samples from the barnacle/scallop zone, and nine samples from the *Mytilus* zone of Leg B1. Depth of collection on Platform Gail ranged from 0.3 to 24.1 m (1 to 79 ft).

At Platform Harvest, a total of 130 taxa were identified. Dominant taxa included *Ophiothrix spiculata*, *Rhodomenia californica*, *Mytilus* spp., *Membranoptera multiramosa*, *Caprella alaskana*, *Megabalanus californicus*, *Mytilus californianus*, *Halosydna brevisetosa*, *Elasmopus* cf. *holgurus*, and *Metridium senile*. Several species, including *Ophiothrix spiculata*, *Caprella alaskana*, *Elasmopus* cf. *holgurus*, *Pycnogonum stearnsi*, and *Hiatella arctica*, were present in all 23 scraping samples. Other species, such as *Rhodomenia californica*, *Mytilus* spp., *Membranoptera multiramosa*, *Megabalanus californicus*, and *Halosydna brevisetosa*, were very abundant when they occurred, but were not always present.

At Platform Gail, a total of 90 taxa were identified. Dominant taxa included *Pterosiphonia dendroidea*, *Anthopleura elegantissima*, *Metridium senile*, *Spirobranchus spinosus*, *Ophiothrix spiculata*, *Elasmopus holgurus*, *Diadumene cincta*, *Balanus trigonus*, and *Metridium exilis*. Several species, including *Elasmopus holgurus* and *Balanus trigonus*, were present in all 31 scraping samples. Other species, such as *Ophiothrix spiculata*, *Pterosiphonia dendroidea*, *Spirobranchus spinosus*, *Metridium exilis*, *Chama arcana*, and *Spirobranchus spinosus*, were very abundant when present, but were not consistently present in all scraping samples. *Mytilus* spp., which was sparse on Leg A1, was a dominant species on Leg B1.

The complex, three-dimensional structure of the barnacle and *Mytilus* zones provides habitat and protection for a variety of interstitial fauna and epibionts, including caprellid and gammarid amphipods, crabs, pycnogonids, brittle stars, holothuroids, gastropods, bivalves, nudibranchs, chitons, polychaetes, anemones, hydroids, hydrozoans, nemerteans, sponges,

bryozoans, tunicates, sipunculids, and flatworms. In total, 181 separate taxonomic entities were noted from the scraping samples collected from platforms Gail and Harvest (**Table ES-5**), including 123 monospecific taxa (i.e., 68% of the taxa were identified to species level). Several of the species identified in the scraping analysis were also noted as density- and/or percent cover-dominant taxa during the whole slide analysis (e.g., *Mytilus*, *Balanus*, *Metridium*, *Anthopleura*, *Ophiothrix*). Results of the scraping analysis also provided further taxonomic clarification for unidentified biota observed during photographic analysis. *Ophiothrix spiculata* and *Ophiopterus papillosa* were the only two ophiuroid species identified during scraping analysis from Platform Harvest. During the whole slide analysis, specimen size, photographic resolution, and/or a lack of specimens upon which a detailed analysis could be conducted resulted in the classification of unidentified ophiuroids in many of the photographs. Scraping analysis results allowed for a complete species-level determination; ophiuroids present in photographs from Platform Harvest were considered to be *Ophiothrix spiculata*, among the dominant taxa at all platforms.

Scraping Data Analysis

Statistical Analysis

Correspondence analysis of the scraping data set from Platform Harvest revealed that the two zones, *Mytilus* and barnacle, were distinct in terms of their respective taxonomic compositions. Further, the taxonomic composition of the *Mytilus* zone was more variable than the barnacle zone.

Wet Weight Determinations

Wet weight determinations of scraping samples from Platform Harvest were variable. Total sample wet weights ranged between 149 and 5,059 g per quadrat (2.4 and 80.9 kg/m²) on Leg B1, but were noticeably higher on the adjacent leg, where they ranged between 2,281 and 25,966 g per 0.0625 m² quadrat (36.5 to 415.5 kg/m²). Average total sample wet weights per quadrat on Leg B1 and B2 were 2,129 and 9,180 g (34 and 147 kg/m²), respectively.

Mussel only biomass measurements (i.e., wet weight, shell included) exhibited similar variability, affecting the relative mussel biomass contribution to the community. Mussel wet weights on Leg B1 ranged from 0 to 4,025 g (0 to 64.4 kg/m²). In contrast, mussel only wet weights from the Leg B2 mussel zone were consistently high, ranging from 3,752 to 17,779 g per quadrat (60.0 to 284.5 kg/m²). These results were generally consistent with results of the whole slide analysis, where highest densities and percent cover estimates were evident above 6 to 8 m water depths.

Minimum and maximum average lengths, widths, and heights for Platform Harvest mussels were 3.81 and 9.90 cm, 2.25 and 4.48 cm, and 1.67 to 3.42 cm, respectively. Individual average weights were variable, ranging from 10.78 to 111.42 g. Smallest mussels were collected at water depths where the fewest mussels were available, while the larger mussel specimens were present in those portions of the platform leg where higher densities were evident.

Table ES-5. Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of platforms Gail and Harvest. Taxa common to both platforms denoted in bold.

<p>FLORA:</p> <p>Algae:</p> <p><i>Acrosorium venulosum</i> <i>Antithamnion hubbsii</i> <i>Branchioglossum bipinnatifidum</i> <i>Callophyllis</i> spp. <i>Ceramium camouii</i> Delesseriaceae, unidentified <i>Heterosiphonia japonica?</i> ¹ <i>Membranoptera multiramosa</i> ² <i>Polysiphonia scopularum</i> <i>Pterosiphonia dendroidea</i> <i>Pugetia fragillissima</i> <i>Pugetia</i> spp. (juvenile) <i>Rhodymenia californica</i> <i>Rhodymenia pacifica</i></p> <p>FAUNA:</p> <p>Crustaceans:</p> <p>Barnacles (Cirripedia): <i>Balanus nubilus</i> <i>Balanus</i> spp. (juvenile) <i>Balanus trigonus</i> <i>Megabalanus californicus</i> <i>Tetraclita rubescens</i></p> <p>Caprellid amphipods: <i>Caprella alaskana</i> <i>Caprella equilibra</i> <i>Caprella ferrea</i> <i>Caprella verrucosa</i></p> <p>Gammarid amphipods: <i>Aoroides</i> spp. <i>Dulichieilla appendiculata</i> <i>Elasmopus</i> cf. <i>holgurus</i> <i>Elasmopus holgurus</i> <i>Erichthonius brasiliensis</i> <i>Gammaropsis thompsoni</i></p>	<p>Gammarid amphipods, continued: <i>Janiralata occidentalis</i> <i>Jassa slatteryi</i> <i>Leucothoe alata</i> <i>Monocorophium</i> spp. <i>Parapleustes pugettensis</i> <i>Podocerus brasiliensis</i> <i>Quadrimaera reishi</i> cf. <i>Sinocorophium</i> spp. <i>Stenothoe estacola</i></p> <p>Crabs (Brachyura, Cancridea): <i>Cancer branneri</i> <i>Cancer jordani</i> <i>Cancer productus</i> <i>Cancer</i> spp. (juvenile) <i>Maera simile</i> <i>Pachycheles pubescens</i> <i>Pachycheles rudis</i> <i>Pachygrapsus crassipes</i> <i>Paraxanthias taylori</i> <i>Pilumnus spinohirsutus</i> <i>Podocerus brasiliensis</i> <i>Scyra acutifrons</i></p> <p>Isopods (Isopoda): <i>Janiropsis tridens</i></p> <p>Sea spiders (Pycnogonida): <i>Anoplodactylus nodosus</i> Pycnogonida, unidentified (juvenile) <i>Pycnogonum stearnsi</i></p> <p>Mysids (Mysidacea): Mysidacea, unidentified (fragment)</p> <p>Echinoderms:</p> <p>Brittle stars (Ophiuroidea): <i>Ophiactis simplex</i> <i>Ophiopteris papillosa</i> <i>Ophiothrix spiculata</i> Ophiuroidea, unidentified (juvenile)</p>	<p>Holothuroids (Holothuroidea): Holothuroidea, unidentified Holothuroidea, unidentified (juvenile) <i>Parastichopus californicus</i> <i>Pentamera lissoplaca</i></p> <p>Urchins (Echinoidea): Echinoidea, unidentified (juvenile) <i>Lytechinus pictus</i> <i>Strongylocentrotus purpuratus</i></p> <p>Mollusks:</p> <p>Bivalves (Pelecypoda): <i>Anomia peruviana</i> <i>Chama arcana</i> <i>Crassadoma gigantea</i> <i>Crassostrea gigas</i> <i>Gregariella chenui</i> <i>Gregariella coarctata</i> <i>Hiatella arctica</i> <i>Irus lamellifer</i> <i>Kellia suborbicularis</i> <i>Lithophaga plumula</i> <i>Modiolus capax</i> <i>Mya arenaria</i> <i>Musculus (=Musculista) spp.</i> <i>Mytilus californianus</i> <i>Mytilus</i> spp. <i>Mytilus</i> spp. (juvenile) <i>Mytilus trossulus/galloprovincialis</i> <i>Ostrea conchaphila</i> <i>Petricola</i> spp. (juvenile) <i>Pododesmus cepio</i> <i>Pseudochama exogyra</i></p> <p>Gastropods (Gastropoda): <i>Amphissa reticulata</i> (dead) <i>Amphissa versicolor</i> <i>Anisodoris nobilis</i> Doridacea, unidentified <i>Iselica ovoidea</i></p>
--	--	---

Table ES-5. Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of Platforms Gail and Harvest. Taxa common to both platforms denoted in bold (continued).

<p>Gastropods (continued): <i>Iselica</i> spp. <i>Seila montereyensis</i> <i>Tritonia diomedea</i></p> <p>Chitons (Polyplacaphores): <i>Mopalia porifera</i></p> <p>Polychaetes: <i>Arabella iricolor</i> <i>Arabella semimaculata</i> <i>Brania</i> spp. <i>Cirratulus</i>, unidentified <i>Dodecaceria concharum</i> <i>Dodecaceria fewkesi</i> <i>Dodecaceria</i>, unidentified <i>Eudistylia polymorpha</i> <i>Halosydna brevisetosa</i> <i>Halosydna johnsoni</i> <i>Harmothoe ? hirsuta</i> <i>Harmothoe</i> spp. <i>Lepidonotus spiculus</i> <i>Myxicola</i> spp. <i>Naineris dendritica</i> <i>Nereis eakini</i> <i>Nereis mendocinana</i> <i>Nereis pelagica neonigripes</i> <i>Paleanotus bellis</i> <i>Pholoides asperus</i> <i>Phyllochaetopterus prolifica</i> <i>Phyllodoce medipapillata</i> <i>Phyllodoce</i> spp. <i>Polydora</i> spp. <i>Proceraea</i> cf. <i>kiienensis</i> <i>Proceraea</i> spp. Sabellidae, unidentified <i>Serpula columbiana</i> <i>Spirobranchus spinosus</i> Syllidae, unidentified <i>Syllis gracilis</i></p>	<p>Polychaetes (continued): <i>Trypanosyllis</i> spp. <i>Typosyllis</i> spp.</p> <p>Cnidarians: Anthozoans (Actiniaria): Actiniidae, unidentified <i>Anthopleura elegantissima</i> (rosy morph) <i>Anthopleura elegantissima</i> <i>Corynactis californica</i> <i>Diadumene cincta</i> <i>Metridium exilis</i> <i>Metridium senile</i></p> <p>Hydrozoans: <i>Campanularia</i> spp. Campanulariidae, unidentified <i>Eucopella everta</i> <i>Filellum serpens</i> <i>Halecium</i> spp. <i>Halecium tenellum</i> <i>Lafoea adnata</i> <i>Obelia geniculata</i> <i>Obelia</i> nr. <i>surcularis</i> <i>Obelia plicata</i> <i>Obelia</i> spp. <i>Plumularia alicia</i> <i>Plumularia alicia</i> complex <i>Plumularia</i> nr. <i>septata</i> <i>Plumularia</i> spp. <i>Sertularella tenella</i> <i>Syncoryne eximia</i></p> <p>Minor Phyla: Bryozoans (Ectoprocta or Bryozoa): <i>Callopora</i> spp. <i>Celleporella</i> spp. <i>Celleporina</i> spp. <i>Costazia</i> spp. <i>Crisia</i> spp. Cyclostomata, unidentified</p>	<p>Bryozoans, continued: Ectoprocta, unidentified <i>Filicrisia</i> spp. <i>Scrupocellaria</i> spp. <i>Tegella</i> spp.</p> <p>Flatworms (Platyhelmenthes): Rhabdozoela, unidentified <i>Stylochoplana longipenis</i> <i>Stylochus</i> spp.</p> <p>Nemerteans (Nemertea): <i>Amphiporus</i> spp. <i>Carinoma mutabilis</i> <i>Lineus rubescens</i> Nemertea, unidentified <i>Paranemertes californica</i> <i>Tetrastemma signifer</i></p> <p>Sipunculids (Sipunculida): <i>Phascolosoma agassizi</i></p> <p>Sponges (Porifera): <i>Haplosclerida</i> nr. <i>Haliclona</i> spp. Porifera sp. A Porifera, unidentified <i>Rhabdodermella nuttingi</i></p> <p>Tunicates (Urochordata, Ascidiacea): <i>Aplidium</i> spp. Aplousobranchia (Diplosoma), unidentified <i>Styela coriacea</i> <i>Styela truncata</i> Tunicate, unidentified</p> <p>Total: 181 taxonomic entries, including 123 monospecific taxa (68%)</p> <p>Footnotes: 1 - <i>Heterosiphonia japonica</i>? Yendo = <i>Heterosiphonia densiuscula</i> Kylin, per Miller (2004); 2 - <i>Membranoptera multimarosa</i> Gardner = <i>Membranoptera platylphylla</i> (Setchell & Gardner) Kylin, per Miller (2004).</p>
---	--	--

Growth Thickness Measurements

Growth thickness measurements were made periodically within the mussel zones at Platform Harvest (two legs) and Irene (single leg). Thickness measures ranged from 5.1 to 30.5 cm (2 to 12 inches). Greatest thickness of the mussel zone occurred at the 14.3 to 16.5 m (47 to 54 ft) on the first leg of Platform Harvest (Leg B1), at 6.7 m (22 ft) on the second leg of Platform Harvest (Leg B2), and 0.3 to 2.7 m (1 to 9 ft) on Irene.

Differences in the depths of maximum thickness between Legs B1 and B2 may be attributed to the fact that Leg B2 is an inner leg, protected on three sides by adjacent legs, whereas Leg B1 is an outer leg. Sloughing of the mussel mat is a common occurrence on platforms, particularly following the passage of storms, as evidenced by the presence of a shell mound at the base (and downcurrent) of each platform.

Platform vs. Natural Hard Bottom - Comparisons of Biota

A comparison of characteristic platform fauna (from the photographs; platform water depths ranged from 74 to 225 m) and the characteristic hard bottom fauna identified and enumerated in the western Santa Barbara Channel and Santa Maria Basin from previous studies (e.g., Steinhauer and Imamura, 1990; Blake and Lissner, 1993; Science Applications International Corporation and Marine Ecological Consultants, 1995) indicated that 13 of the 30 natural hard bottom megafauna taxa also occur on the platforms, however, nearly half of these taxa occurred only once (i.e., sole occurrence on a single platform). Most frequently encountered species include *Metridium farcimen* and a tan zoanthid. The zoanthid depth distribution was across the entire platform leg depth. *M. farcimen* depth distribution was more restricted. For a limited number of species which occur at both platforms and hard bottom features (e.g., *Galathea californiensis*), respective depth distributions are similar. Depth distribution for other species was confounding and no apparent trends were evident.

ES-4 Summary

In summary, the major findings pertinent to invertebrate and algal communities inhabiting six of California's platforms and two natural rock outcrops include the following:

- (1) Results of videotape, quantitative slide, and point contact analyses, in general, produced similar biotic zonation patterns at the platforms studied, although an alternate, three-zone approach to platform characterization may be viable.
- (2) A total of 173 species (or higher taxa) were identified during quantitative slide analysis of 821 photographs from six platforms and two rock outcrops, while a total of 55 species or higher taxa were identified during point count analysis of 883 photographs from six platforms; invertebrate fauna dominated, with only a few algal species/species groups evident (filamentous and foliose red algae; other red and green algae).

- (3) In general, the presence and relative ranking of percent cover dominants from the point count analysis were very consistent with the results of whole slide analysis. Random point count analysis provides a straightforward means of identifying percent cover dominants, whereas quantitative slide analysis (i.e., individual counts or percent cover) provides a more comprehensive characterization of all taxa present, within the limitations of photographic interpretation and identification.
- (4) A total of 130 species or higher taxa (primarily cryptic, interstitial forms typically not visible via photographic techniques) were identified during analysis of scraping samples from the mussel and barnacle zones of Platform Harvest; a total of 90 species or higher taxa were identified from scraping samples from the intertidal, barnacle, and mussel zones of Platform Gail. Findings highlight the complexity and three-dimensional structure of these zones. In total, 181 separate taxonomic entities were noted from scrapings at both platforms, of which 123 (68%) were monospecific taxa. Only 41 taxa occurred at both platforms.
- (5) A mussel zone was present at each platform, although the vertical extent and maximum depth of each mussel zone varied between platforms; considerable variability in mussel density and percent cover was evident.
- (6) Highest species- or taxa-specific density levels were typically encountered in the upper portions of each platform, normally within the upper 30 m (100 ft); within this depth range, the intertidal and mussel zones also contained several other numerically dominant species (e.g., anemones, ophiuroids, barnacles, algae).
- (7) Middle and lower portions of each platform showed considerable variability, but typically contained encrusters (e.g., sponges) and various cnidarian species (e.g., *Metridium*, *Corynactis*); some prominent species at depth were limited in their geographic distribution (e.g., *Desmophyllum dianthus* only at Platform Gail; red encruster only at platforms Harvest, Hidalgo, and Irene). On the deeper water platforms (i.e., Gail and Harvest), deepest zones at the bottom of each platform exhibited a strong affinity to basin fauna.
- (8) Upper portions of the platforms exhibited similar dominant taxa; taxa unique to each platform tended to occur at depth. Overall, comparisons of density- and percent cover-dominants from adjacent platform legs were very similar, although species-specific enumerations were variable.
- (9) Clustering analyses comparing density- and percent cover-dominants at the six platforms identified strong similarities between adjacent platform legs and relatively strong similarity between all platforms, with minor exceptions (i.e., few trends suggesting existence of a north-south gradient in species composition).
- (10) Correspondence analysis of the scraping data revealed that *Mytilus* and barnacle zones were distinct in terms of their respective taxonomic compositions; taxonomic composition of the *Mytilus* zone was more variable than the barnacle zone; and
- (11) Species diversity at the platforms was relatively high, although the number of species present in individual photographs was relatively low and species diversity at natural outcrops was higher (within comparable, shallow depth zones) than that observed at the platforms.

There are few substrates comparable to those afforded by existing platform structures. Naturally-occurring rock substrates that mimic the entire depth range (i.e., continuous substrate) found on platforms do not exist, while intermittent or discontinuous outcrop features exhibiting limited vertical extent are limited (e.g., shallow nearshore outcrops; shelf and slope hard bottom features with vertical relief of 1 to 3 m). Submerged platform surfaces, including platform legs, are optimal settling plates which provide habitat for a variety of attached and motile biota, particularly in the shallower portions of a platform where *Mytilus*, *Metridium senile*, barnacles, and associated fauna and flora predominate. Mid and lower platform zones exhibit decreasing species diversity with depth, yet frequently contain unique taxa which suggest subtle differences in platform community structure affected by platform location.

1.0 Introduction

The U.S. Department of the Interior, Minerals Management Service (MMS) is mandated by the Outer Continental Shelf (OCS) Lands Act, as amended, to manage the development of OCS oil, gas, and mineral resources, while protecting the human, marine, and coastal environments. Thus, MMS oversees the orderly development of offshore resources in an environmentally sound manner. MMS also compiles, summarizes, and evaluates scientific and technical information pertinent to environmental resources and the potential effects of oil and gas operations on such resources as part of its mandate. Such information may be utilized in one or more ways. For example, it may provide the basis upon which impacts of proposed operations on the environment are determined (i.e., used in the preparation of environmental assessments or environmental impact statements pursuant to Federal environmental laws).

In the Pacific OCS Region, a total of 24 oil and gas production facilities have been installed in Federal waters. All of these facilities have been located in the Southern California Planning Area, with all found either in the Santa Maria Basin, Santa Barbara Channel, or San Pedro Bay (**Figure 1-1**). Twenty-two of these facilities were installed to produce oil and gas; the remaining two facilities were installed for oil and/or gas processing. Only one of these facilities has been decommissioned and removed to date (i.e., Exxon's Offshore Storage and Transfer [OS&T] unit in the Santa Ynez Unit, Santa Barbara Channel).

All of California's OCS platform facilities were installed during the 23-year period from 1967 through 1989. While more than 1 billion barrels of oil and 1.3 trillion cubic feet of gas have been produced from these operations (through March 2003), production volumes from Federal waters offshore California are presently reflecting a general decrease over time. Given the projected life expectancy of production operations at each offshore facility (i.e., impending decommissioning and removal of several platforms in the next several years), the MMS has a vested regulatory mandate and scientific interest in properly characterizing the platform-associated communities present on California's OCS.

As with most biological systems, there are recognized data gaps in our knowledge of marine ecosystems. In particular, the faunal components found in association with offshore oil and gas platforms are only recently being studied, particularly on the California OCS. Of particular interest is a characterization of the epifaunal and epifloral communities found on these artificial structures. One important unknown aspect of platform-associated biology pertains to the relative contribution of these communities to the regional ecosystem. For example, how productive are these communities and what loss of biological production will occur when these platforms are removed?

To address these information gaps as they pertain to platform-associated communities, the MMS developed two primary study objectives - to conduct field surveys of invertebrate and algal communities at selected oil and gas platforms and natural reefs in the Santa Barbara Channel and Santa Maria Basin, and to describe community structure by determining abundance, density, and distribution of these species.

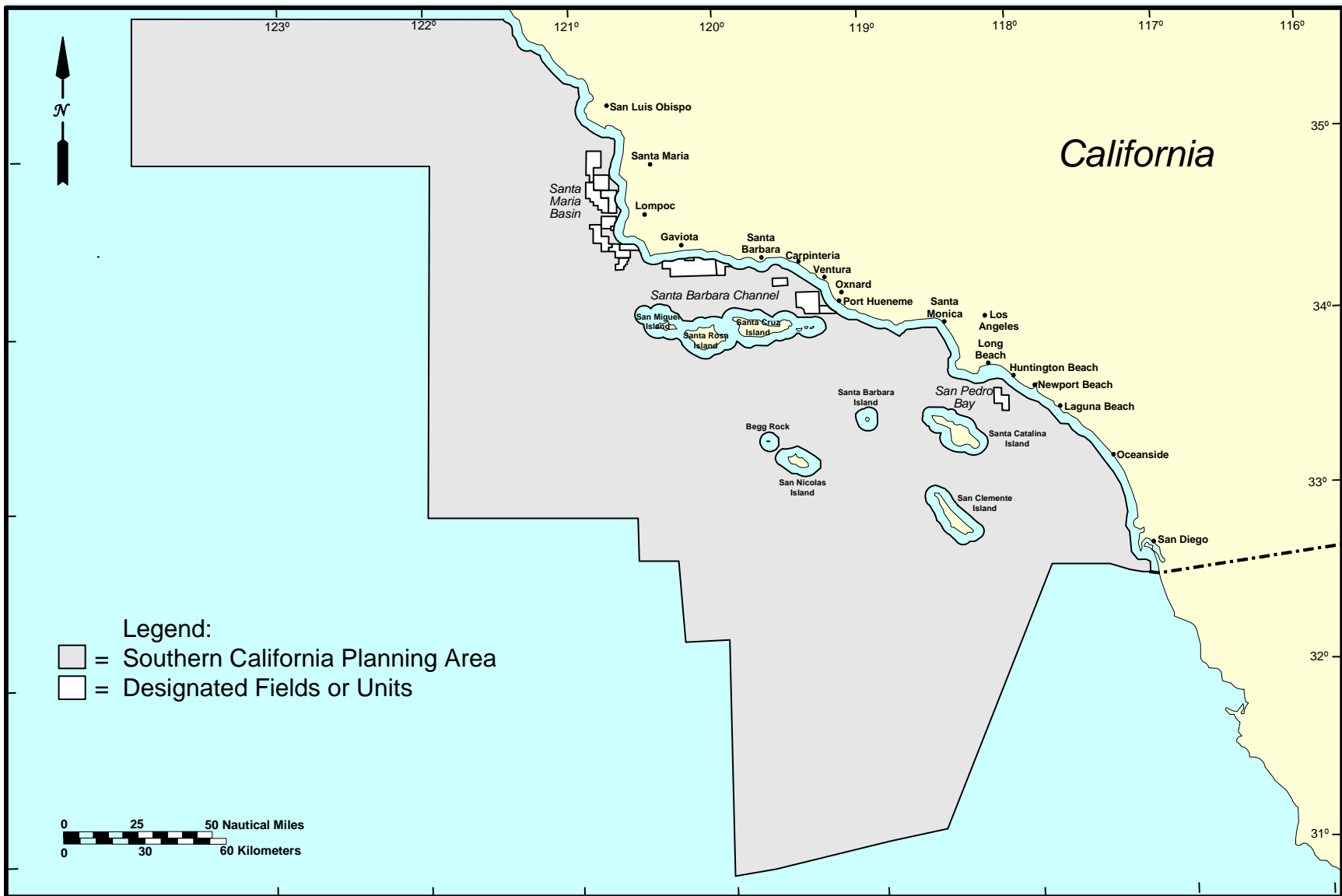


Figure 1-1. Southern California Planning Area, including currently designated fields or units (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2001).

Specific study objectives included:

- (1) Determine abundance, density, and depth distribution/vertical zonation characteristics of invertebrate and algal communities on selected platforms and natural reefs;
- (2) Quantify biomass production estimates of invertebrate and algal communities on platforms (and natural reefs, where practical);
- (3) Conduct the research using methods that are similar or complementary to those being used in related studies; and
- (4) Evaluate and discuss the relative importance of platform-associated invertebrate and algal communities to the ecology of the region.

In June 1998, the MMS awarded a contract to Continental Shelf Associates, Inc. (CSA) of Jupiter, Florida and Monterey, California to conduct detailed field surveys at select platforms on the California OCS and to characterize the invertebrate and algal communities present. CSA was supported in this project by a highly qualified team of biologists, including

- Robert P. Meek, Ph.D., Principal Investigator (ECOMAR, Inc., Goleta, CA);
- Suzanne V. Benech, M.S. (Benech Biological and Associates, Ventura, CA); and
- John C. Ljubenkov, M.S. (Dancing Coyote Ranch Taxonomy, Pauma Valley, CA).

Additional technical oversight and guidance were provided by a Quality Review Board (QRB), including

- John (Jack) M. Engle, Ph.D. (Marine Science Institute, University of California, Santa Barbara, Santa Barbara, CA);
- Miriam Polne-Fuller, Ph.D. (Marine Science Institute, University of California, Santa Barbara Santa Barbara, CA); and
- James P. Ray, Ph.D. (Oceanic Environmental Solutions, LLC, Spring, TX).

To address these objectives, a series of questions were developed, followed by selection of appropriate sampling and data analysis methods. The primary questions to be addressed included:

- (1) What benthic biota live on platforms?
- (2) Do platform benthic biota differ between legs (using sampling results from adjacent platform legs)?
- (3) Do platform benthic biota differ between platforms?
- (4) Do platform benthic biota differ between depth zones?
- (5) Do platform benthic biota differ between oceanographic regions (Santa Maria Basin vs. eastern Santa Barbara Channel)?
- (6) Do platform benthic biota differ between platforms and naturally occurring hard bottom areas (e.g., pinnacles)?

The following report summarizes the findings of this study effort. **Section 2.0** outlines materials and methods employed to collect and analyze various data sets. **Section 3.0** considers the characteristics of each of the sites sampled, with results and discussion centering on species

diversity, dominant taxa, and depth distribution data derived from videotape and quantitative photographic analysis and discrete sampling. **Section 4.0** provides a discussion of platform and reef/outcrop community characteristics, compares biota between adjacent platform legs and between platforms, compares platform taxa to natural hard bottom communities, and discusses general trends evident in the composition and depth distribution of platform-associated invertebrate and algal communities. **Sections 5.0** and **6.0** provide a list of preparers and literature cited, respectively.

2.0 Materials and Methods

2.1 Review of Platform Information

As of December 2004, the MMS oversees activities on 79 active leases in Federal OCS waters offshore California, of which 43 are currently producing (i.e., oil and gas production and/or processing operations). Groupings of active leases form fields or units, 19 of which stretch from the Santa Maria Basin region (north of Pt. Conception, offshore southern central California) to San Pedro Bay, including portions of the western and eastern Santa Barbara Channel (**Figures 2-1** and **2-2**). Within this region, there are 23 platforms in Federal waters of the California OCS (**Table 2-1**).

2.2 Platform Selection and Inspection Videotape Review

All platforms on the California OCS were considered as potential sampling sites during the platform selection process. Criteria for selection included a consideration of water depth and geographic location. In consideration of difference in mesoscale oceanographic conditions, the Santa Barbara Channel and Santa Maria Basin regions and the platforms found within these areas were identified as optimal candidates for study. Further, water depths in which these facilities are found range from relatively shallow to deep (i.e., shallowest at Platform Gina in 29 m of water; deepest at Platform Harmony in 365 m of water). Eight platforms were identified as preferred sampling locations – Platforms Irene, Hidalgo, Harvest, and Hermosa in the Santa Maria Basin, Platform Hondo in the western Santa Barbara Channel, and Platforms Grace, Gail, and Habitat in the eastern Santa Barbara Channel.

Among these eight facilities, four *primary platforms* were selected for sampling – Grace, Gail, Hidalgo, and Harvest; at each of these primary platforms, two outer legs were photographed and videotaped from the intertidal zone to the base of the platform. Four additional *secondary platforms* were also selected – Hondo, Hermosa, Habitat, and Irene; at these locations, only single outer legs were slated for photographic and videotape characterization from the intertidal zone to the platform base. Two of the secondary platforms – Hermosa and Hondo, located in deeper waters of the Santa Maria Basin and Santa Barbara Channel, were not sampled due to operational restrictions and/or weather constraints. Naturally occurring rocky outcrops, or pinnacles, were also sampled using similar quantitative photographic techniques. Sites selected for this aspect of the project included Diablo and Nifty Rocks, two outcrops located off the northern Channel Islands in the Santa Barbara Channel. A summary of sampling activities conducted at each platform and natural reef is provided in **Table 2-2**¹.

During the platform review and selection process, contact was made with individual operators regarding prior cleaning history and future activity (e.g., repair work, drilling operations, planned cleaning); platforms with recent cleaning activity were removed from

¹ Offshore operators utilize an alphanumeric system to label individual platform legs (i.e., A, B, C along one platform axis, 1, 2, 3, etc. along the adjacent axis). Numerical axes run east-west for Santa Barbara Channel platforms and north-south for Santa Maria Basin platforms. Individual leg designations and orientation for the six platforms are detailed in **Section 3.2**; see also **Figures 3-1** through **3-3**.

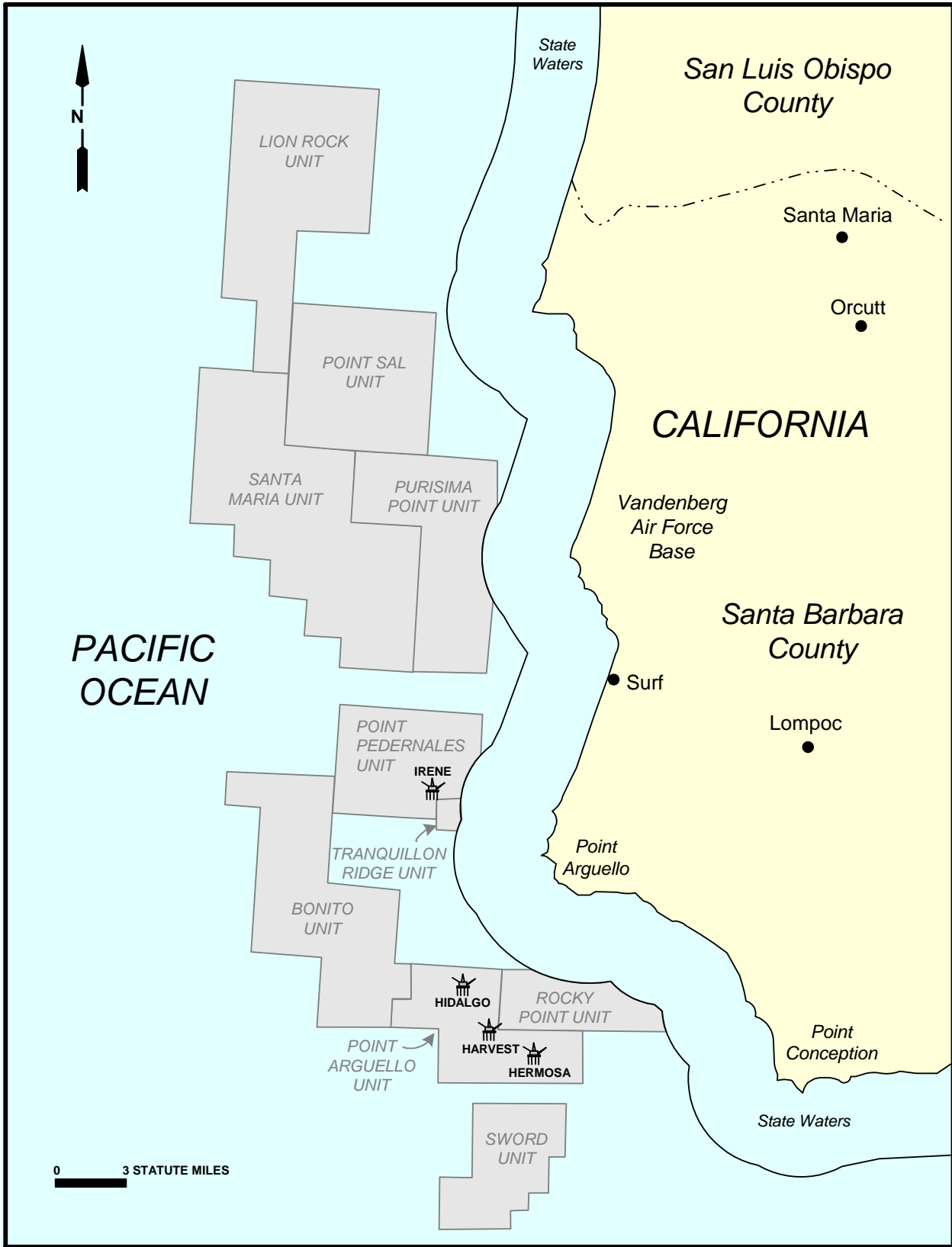


Figure 2-1. Santa Maria Basin OCS operations (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2001).

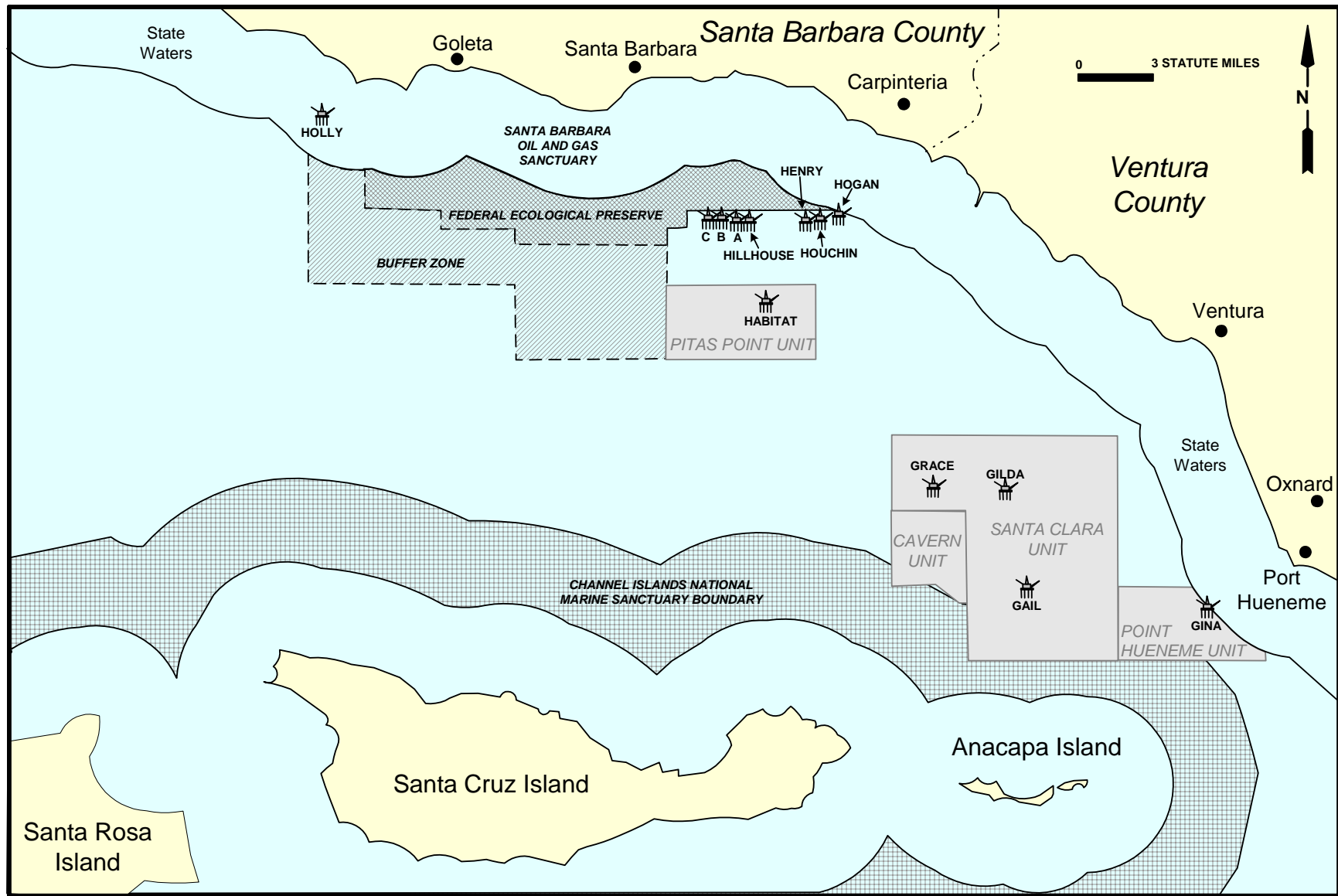


Figure 2-2. East Santa Barbara Channel OCS operations (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2001).

Table 2-1. Summary of California OCS candidate platforms, designated units or fields, and platform water depth and installation date by geographic area (Adapted from: U.S. Department of the Interior, Minerals Management Service, 2005).

Field or Unit	Platform	Operator	Depth (m)	Installation Date
<i>Southern Santa Maria Basin</i>				
Point Pedernales Unit	Irene	Plains Exploration & Production Co.	74	Aug 1985
Pt. Arguello Field/Unit	Hidalgo	Arguello, Inc.	131	July 1986
	Harvest	Arguello, Inc.	206	June 1985
	Hermosa	Arguello, Inc.	184	Oct 1985
<i>Santa Barbara Channel</i>				
Santa Ynez Unit	Hondo	ExxonMobil Corporation	257	June 1976
	Harmony	ExxonMobil Corporation	365	June 1989
	Heritage	ExxonMobil Corporation	328	Oct 1989
Pitas Point Unit	Habitat	Plains Exploration & Production Co.	88	Oct 1981
Dos Cuadras Field	Hillhouse	Plains Exploration & Production Co.	58	Nov 1969
	A	Plains Exploration & Production Co.	57	Sept 1968
	B	Plains Exploration & Production Co.	58	Nov 1968
	C	Plains Exploration & Production Co.	59	Feb 1977
Carpinteria Offshore Field	Henry	Plains Exploration & Production Co.	53	Aug 1979
	Houchin	Pacific Operators Offshore LLC	50	July 1968
	Hogan	Pacific Operators Offshore LLC	47	Sept 1967
Santa Clara Field/Unit	Grace	Venoco, Inc.	97	July 1969
	Gail	Venoco, Inc.	225	Apr 1987
	Gilda	Plains Exploration & Production Co.	62	Jan 1981
Point Hueneme Unit	Gina	Plains Exploration & Production Co.	29	Dec 1980
<i>San Pedro Bay</i>				
Beta Field/Unit	Edith	Plains Exploration & Production Co.	49	Jan 1983
	Elly	Aera Energy LLC	78	Mar 1980
	Ellen	Aera Energy LLC	81	Jan 1980
	Eureka	Aera Energy LLC	213	July 1984

Table 2-2. Summary of sampling conducted during the analysis of invertebrate and algal communities on offshore oil and gas platforms in southern California.

Platform and Leg(s) Sampled	Diver Video	Diver Photos	ROV Video	ROV Photos	Scraping	Growth
<i>Primary Platforms (2 legs per platform)</i>						
Gail - Legs A1, B1	+	+	+	+	+	-
Grace - Legs C1, C4	+	+	+	+	-	-
Harvest - Legs B1, B2	+	+	+	+	+	+
Hidalgo - Leg A1, B1	+	+	+	+	-	-
<i>Secondary Platforms (1 leg per platform)</i>						
Habitat - Leg A1	+	+	+	+	-	-
Irene - Leg A1	+	+	+	+	-	+
<i>Offshore Rocks/Pinnacles</i>						
Diablo Rock	+	+	-	-	-	-
Nifty Rock	+	+	-	-	-	-
<i>Key: + = data collected; - = no sampling required; ROV = remotely operated vehicle.</i>						

further consideration. The selection of candidate sites was based on recommendations and guidance offered by the MMS, the project team, and members of the Quality Review Board (QRB).

Sampling priorities and rationale for the six platforms and two pinnacles were as follows. Depending upon the number of platform legs to be sampled, platforms were either designated as primary (i.e., two legs to be sampled) or secondary (i.e., one leg to be sampled). Among the primary platforms targeted, Platforms Grace and Hidalgo are both located in relatively shallow water (i.e., 97 to 131 m), with one platform in the Santa Barbara Channel and the other in the Santa Maria Basin.

Platforms Gail and Harvest are located in intermediate to deep waters (i.e., 206 to 225 m), with one platform in the Santa Barbara Channel and the other in the Santa Maria Basin. For the secondary platforms, Platforms Habitat and Irene are located in relatively shallow water depths (i.e., 74 to 88 m) either within the Santa Barbara Channel or Santa Maria Basin.

Also of interest to this study effort were the invertebrate and algal communities found in association with naturally occurring rock outcrops or pinnacles. Only a limited number of suitable candidate sites were identified, most of which occur off the northern Channel Islands. Diablo and Nifty Rocks were selected for sampling following discussions with the MMS and the QRB. Diablo Rock is located several kilometers to the west of Diablo Point, off the northern coastline of Santa Cruz Island (**Figure 2-3**). Water depths at the base of this feature are approximately 33 m. Similarly, Nifty Rock is located several kilometers east-southeast of Harris Point, off the northwestern point of San Miguel Island (**Figure 2-4**). Water depths at the foot of this rock outcrop are approximately 15 m.

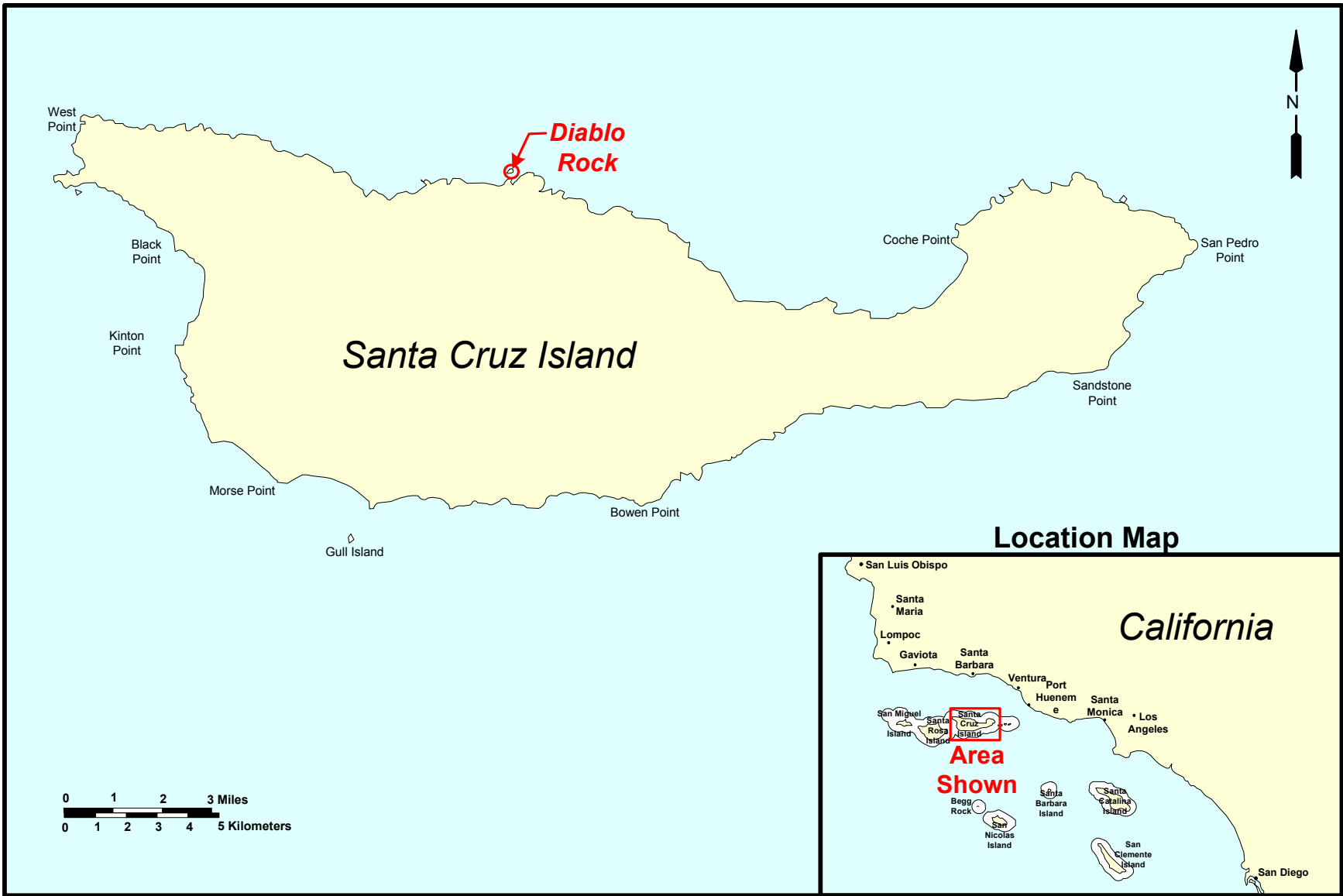


Figure 2-3. Location of Diablo Rock, Santa Cruz Island, California.

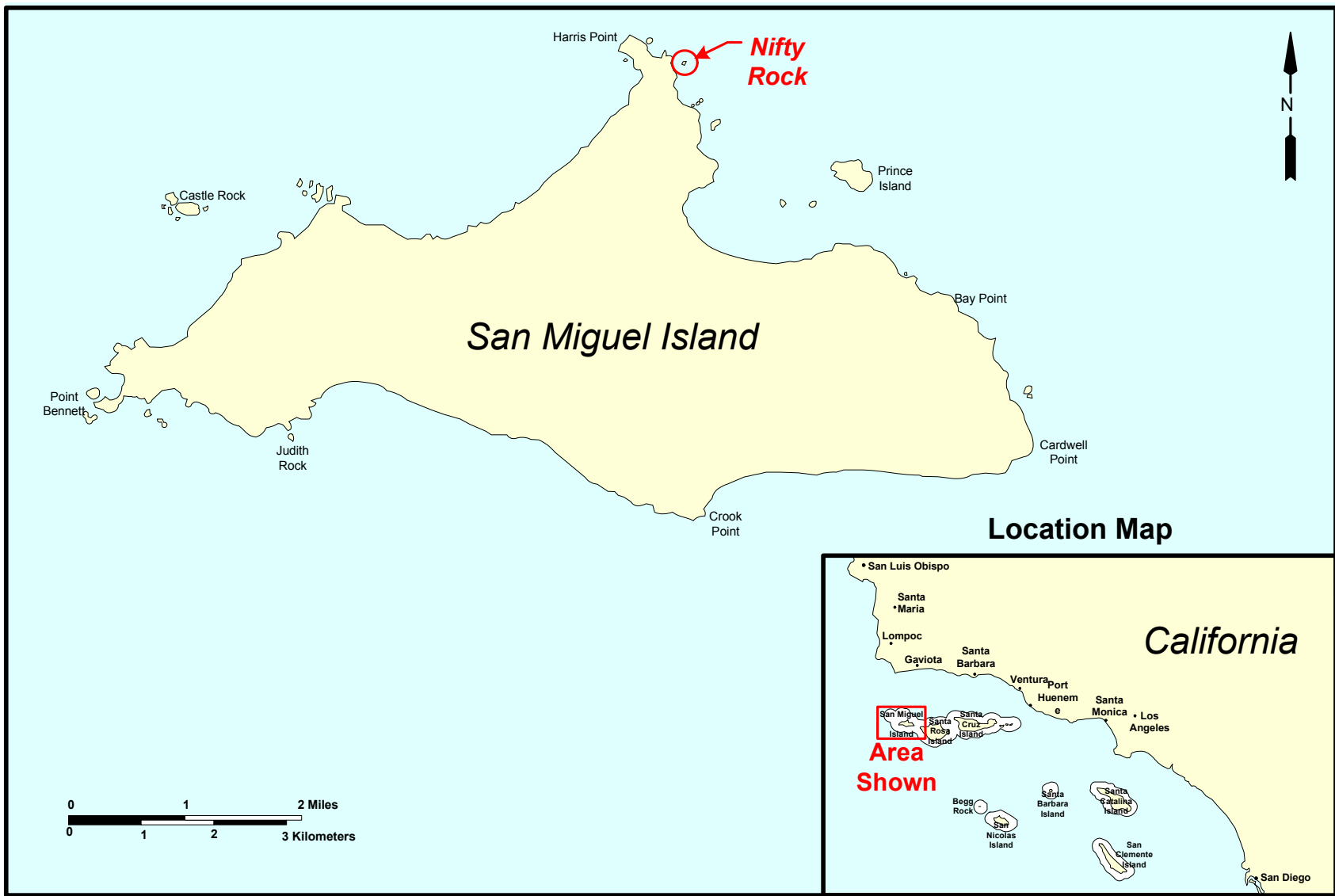


Figure 2-4. Location of Nifty Rock, San Miguel Island, California.

The scope of sampling conducted at each platform and rock outcrop varied. At all platforms and rock outcrops, sampling emphasized collection of 35-mm slide transparencies (i.e., photoquadrats) and high resolution color video, each of which was collected via diver (i.e., from the intertidal zone to 24 m subsurface) and ROV (from 24 m subsurface to the seafloor). **Table 2-2** summarizes sampling conducted at platform and rock outcrop sites. In addition, “scraping” collections (i.e., removal of all epibiota within a prescribed area) and thickness/depth measurements (i.e., measurement from the outer portion of the community inward to the platform leg) were also completed at several select platforms, as noted in **Table 2-2**.

After primary and secondary platforms were identified, biologists reviewed MMS inspection videotapes. The purpose of this videotape analysis was to establish preliminary biotic zonation patterns along the outer portions of the legs of each platform. Review of the tapes occurred at the MMS Pacific OCS Region office in Camarillo, CA. Depth and range characteristics of these biotic zones were used in determining where discrete samples (e.g., 35-mm slides, scrapings) were to be taken during subsequent field surveys.

2.3 Field Surveys

Field surveys were completed in several phases between 1998 and 2000. A preliminary survey was conducted in October 1998 to test the various diver and ROV systems. Full surveys at six platforms were slated for late 1999 through late 2000. All surveys were completed using the R/V *Dawn*, a 30-m research vessel operated by ECOMAR, Inc. of Goleta, CA. Precision navigation was provided by a Gorman differential global positioning system. Select surface operations were also videotaped using a Sony Hi-8 video camera.

The *Dawn* supported both scientific diver and ROV operations. Both divers and the ROV were employed to collect high resolution color video and 35-mm slide transparencies from one or two platform legs, depending upon whether the site was a primary or secondary platform. Divers also collected 1/16 m² (0.0625 m²) scraping samples from select platform legs. Diver operations were restricted to water depths from the surface to 24 m subsurface. ROV operations extended from 24 m subsurface to the seafloor. Videotape and photographic data collection specifications, by platform, are provided in **Table 2-2**.

For ROV operations, a Phantom HD2 ROV was equipped with (1) a Kongsberg/Simrad Photosea PS1000A 35-mm camera; (2) a Benthos DSC4000 camera and lighting system; (3) a Sony high resolution (>450 lines of resolution/inch) Deep Ocean Engineering Color Smart Zoom video camera; (4) a Mesotech MS 900 sonar unit; and (5) a three-function manipulator arm. Aboard the *Dawn*, dual Super VHS videocassette recorders were employed as primary recording equipment, generating two original tapes. Frame number, time, and water depth were recorded on data sheets for each of the ROV slide transparencies collected.

For scientific diver operations, equipment included (1) a 35-mm Nikonos V camera with strobe; and (2) a hand-held Nikon Super Hi-8 video camera housed in an Amphibico housing. Divers utilized surface supplied air using a Heliox 18 bandmask. Diver videotape operations produced a single, Hi-8 videotape. During diving operations, two-way communication occurred between divers and the surface. All diver observations were recorded on data sheets.

2.3.1 Operational Procedures

Detailed operational and sampling procedures are outlined in an updated version of the sampling plan (**Appendix A**). This appendix outlines the full suite of operational procedures used during the surveys, including vessel departure and logistics, as well as mooring systems and the mooring process.

2.3.2 Platform Leg Selection

Mooring location was the primary determining factor as to which legs were sampled. Deviations in site-specific conditions also prompted adjustments to these preferred designations; recommendations for such adjustments were made in the field. Legs sampled at each platform are designated in **Table 2-2**.

2.3.3 Sampling Procedures

Surveying and sampling occurred in two different modes. Diving operations were conducted from deepest to shallowest diving depths in compliance with proper diving protocols. ROV operations routinely occurred from the surface to the seafloor (i.e., surveying of the upper biotic zones downward). Diver operations were limited to the upper 24 m of the water column, below which ROV operations occurred. Multiple dives were common. When feasible, the extent and characteristics of the litterfall zone around each platform (i.e., at the base of the platform leg[s] sampled, downcurrent) were characterized via ROV. Protocols followed for diver mobilization and specifics of the diving equipment suite are outlined in **Appendix A**.

Diver Video

The diver video system consisted of a hand-held Sony Hi-8 color camera and housing with a wide-angle lens. The system was pre-set at a focal length of approximately 1 m and moved slowly at a rate of 1.8 to 2.4 m/min. Two 250-watt underwater lights were used to color fill the frame, aiding in video detail and proper color rendition (i.e., an aid to post-survey video interpretation and biological identification). Periodically, annotation of the videotapes was augmented by placing a dive computer in the field of view displaying depth and dive duration.

Diver Photography

Photographic data (photoquadrats) were collected via diver (hand-held) 35-mm color camera and a 0.0625 m² photoquadrat frame (i.e., image area 25 cm x 25 cm). Optimal photographic results were achieved through the use of a Nikonos V camera equipped with a 28-mm Nikon lens and a dual strobe configuration. All photographs and settings were logged verbally by the diver and recorded by the tender and data recording personnel. Ten to 15 photographs (slide transparencies) were taken per zone; photograph location was predetermined using the randomization protocol (**Appendix B**). It was expected that the zones found at each platform would conform to the zonation patterns defined during the inspection videotape analysis.

Diver Sampling (Air Lift) System and Scraping Collections

The diver sampling system consisted of a 10-cm diameter flexible hose array, air compressor, sample accumulator drum, and screening system. The flexible hose array was connected at the surface to a high volume compressor and consisted of 30 m of hose attached to a down weight. At depth, the air lift system was also connected to a 10-cm diameter, 30-m long diver sampling hose that terminated on deck into a 4-L aluminum accumulator drum (i.e., to allow slow deceleration of the sample). Compressed air was forced down the air hose, creating a suction and entraining effect at the hose terminus underwater; entrained seawater (from depth) and air were transported to the surface. Specimens were carried up the sampling hose in the entrained seawater and entered the accumulator horizontally near the top of the drum. Seawater and entrained biota swirled and decelerated in a clockwise direction within the drum before exiting through an opening at the bottom of the drum. The accumulator drum was positioned over a sieve box (i.e., two nested screens) outfitted with removable, 1.0-mm and 0.5-mm Nytex mesh screening to capture scraped material as it exited the bottom of the accumulator drum.

Divers employed a 0.0625 m² quadrat (i.e., 25 cm x 25 cm) and a small pneumatic hammer and chisel to measure and dislodge the biological material within the quadrat frame. Scraped material was suctioned off the quadrat and conveyed to the surface via the lift system. The depth of the down weight and lift system were adjusted as needed, depending upon diver depth and position.

The lift system was activated prior to any scraping activity to assure that cryptic and motile interstitial fauna were collected. The lift system continued to operate for 20 to 30 seconds after scraping was completed to clear all specimens from the lift line (i.e., to assure that scraped specimens reached the surface). Field preparation of algal and invertebrate samples was via buffered formalin preservation (i.e., no freezing; 4 percent formalin solution for algae; 10 percent formalin solution for invertebrates). Some pressing was completed for larger algal specimens. Invertebrates were relaxed prior to preservation using magnesium sulfate. Observations of sample content were made prior to fixation. When practical, large algal specimens were processed separately to facilitate pressing. Biotic zones sampled included the mussel (*Mytilus*) zone² and the barnacle/scallop zone. A minimum of eight scrapings per zone per platform leg was proposed; scrapings occurred at Platforms Gail and Harvest.

ROV Video

The ROV video system was operated at vertical speeds of 1.8 to 2.4 m/min at a distance of 0.6 to 0.9 m, appropriate for general biological characterization. Zoom capabilities were employed, as needed, to investigate community components of interest.

² *Mytilus* refers to the *Mytilus* species complex, which contains *Mytilus californianus*, *M. galloprovincialis*, and *M. trossulus*.

ROV Photography

Photographs collected by the ROV were consistent with those collected by divers. Proper focal distance was assured through the use of an ROV-mounted laser sighting system maintained within the field of view of the video camera. The ROV was equipped with a Photosea PS 1000A 35-mm camera and 1500S strobe system for still photography; the camera was fitted with a 28-mm lens. Based on results from the preliminary survey, focal distance and aperture were preset (i.e., lens to subject distance of 40.6 cm; lens aperture at f 22). The camera was bulk loaded with 200 ASA color slide film. Use of the laser sighting system ensured precise and repeatable photographic distances between photographs both along the legs of a particular platform and between platforms. Consistent focal distance and image area also allowed for a standardized estimation of the relative size of biota and other features.

The depth at which each photograph was collected was predetermined using a randomized sampling approach. This was accomplished by referencing the zonation patterns determined via inspection videotape review for each platform, eliminating 0.6 m at the edges of each zone (i.e., transition zone), and implementing a randomization protocol for the remaining region within each biotic zone.

ROV and Diver Recording and Annotation

Dual recording systems were used to provide two original S-VHS tapes for each ROV excursion. The second recorder in the series was hooked to a TV monitor where recorded video quality was continuously monitored. Diver video was copied from Hi-8 to S-VHS; the S-VHS copy was utilized during biological interpretation. Photographs were taken in slide format (i.e., E6). Periodically, test strips were developed on board or at the end of each field day to ensure proper photograph collection (i.e., proper focal distance and aperture setting). All photographs were logged and annotated by both the tender and quality assurance/quality control (QA/QC) personnel.

Sample Labeling

All samples were labeled with a unique station number and date (i.e., platform and leg designation, sample depth). Samples containing specimens (i.e., scrapings, voucher collections) were also prepared using internal labels containing the same station and date information. All samples (i.e., photographs, videotapes, vouchers) were logged upon collection. Sample collection and sample tracking forms were maintained per proper QA/QC protocols.

2.4 Sample Analyses

2.4.1 Quantitative Slide and Videotape Analysis

Post-cruise analysis of data included videotape review and quantitative slide analysis (QSA). QSA (also called photographic analysis because digital slide images/photographs were also reviewed) encompassed two approaches to biotic characterization, including (1) complete identification of specimens within each slide (whole slide analysis); and (2) identification of biota present under 50 randomly placed points (random point or point count analysis).

For whole slide analyses, 15 or more photographic images per biotic zone were analyzed. During whole slide analysis, each 35-mm image was projected onto a large screen and the taxonomic identification and enumeration of biota present (i.e., abundance and percent cover) was completed. Species names and slide data (i.e., slide code, water depth, date and time of collection) were manually entered onto data sheets and subsequently transcribed into separate (i.e., platform leg-specific) MS Excel spreadsheets. Each spreadsheet contained a unique photographic code, date of collection, leg designation, and water depth.

Following completion of the whole slide analysis, all 35-mm slides were digitized to facilitate error checking and as a prelude to completion of point count analysis. During point count analysis, digital images were processed using PointCount'99® software. PointCount'99® software was originally designed for the U.S. EPA Coral Reef Monitoring Project by researchers at the University of Georgia (Dustan et al., 1999). Since its inception, it has been applied to a variety of hard bottom/live bottom photographic surveys as an analytical tool. In brief, the program allows for (1) application of a prescribed number of random points to each photographic image in a series; (2) assignment of a region- or area-specific species or group name (from a composite listing of potential species or groups); (3) tracking and compilation of species/groups encountered on each digital image; and (4) preparation of an output file for each platform leg. PointCount'99® was used to randomly generate a total of 50 points on each slide (i.e., digital image). Each digital image was organized into an appropriate group (i.e., by individual platform leg) prior to analysis, then assigned a unique file name (i.e., coded to platform, leg, and unique photograph number). During point count analysis, all photographic images were reviewed.

Approximately nine hundred individual photographic images were characterized during the two step analysis – the first during QSA (whole slide analysis) and subsequently during point count analysis. All identified biota entered into the spreadsheets were organized by platform leg. Zonation patterns and identification of mega-epibiota were also documented from a review of digital images and videotapes.

2.4.2 Voucher Collections

Voucher collections were sorted and identified to the lowest practical taxon. Voucher collections were intended to characterize the most prominent epifaunal species (i.e., major community formers).

2.4.3 Scraping Collections

Based on the preliminary results of sampling within the mussel zone on Platform Grace, an optimal number of scrapings per zone was determined (i.e., eight scrapings per biotic zone). Scrapings from the mussel and barnacle/scallop zones of Platforms Gail and Harvest were analyzed. Total sample weight and mussel weight measurements were made on scraping samples. Individual mussels from Platform Harvest were measured and weighed. Whole scraping samples were subsequently sorted into major phylogenetic groups and forwarded to individual taxonomic experts for complete identification. Species identification data, relative abundance, wet weight determinations, and mussel measurements were entered into an MS Excel spreadsheet for subsequent analysis.

2.4.4 Growth Thickness Measurements

Growth thickness measurements were completed by divers during sampling operations at Platforms Harvest and Irene. A hand-held ruler was used at varying water depths and the thickness of the biota present (e.g., from the outer edge of the mussel bed to the platform leg) was measured and relayed to the data recorder. Thickness measurements made in the field were transferred to an MS Excel spreadsheet for tabularization and analysis.

2.5 Data Analyses

After all photographic and scraping analyses were completed, taxonomic data were reviewed and standardized. For each platform leg, both density (i.e., individual counts) and percent cover of the species or taxa present were estimated and separate spreadsheets created. Basic summary statistics were generated for each species or taxon present (i.e., sum of individual counts or percent cover; maximum; minimum; number of occurrences; average per occurrence). Species or taxa were subsequently sorted based on the sum of individual counts or (cumulative) percent cover. Spreadsheets were analyzed to determine if trends or unique characteristics were evident. Total numbers of species (or higher taxa) and dominants (abundance, percent cover) were determined for each platform leg sampled. Mussel bed thickness measurements were also tabularized for comparative purposes.

Six basic questions related to community composition, intra- and inter-platform variability, and zonation patterns were addressed in the statistical analysis of the data with the overall purpose to determine density, percent cover, and depth distribution/vertical zonation characteristics of invertebrate and algal communities on selected platforms:

- What benthic biota live on platforms?
- Do platform benthic biota differ between legs (primary platforms)?
- Do platform benthic biota differ between platforms (all platforms sampled)?
- Do platform benthic biota differ between depth zones?
- Do platform benthic biota differ between oceanographic regions?
- Do platform benthic biota differ between platforms and pinnacles?

The analytical approach employed was consistent with that used during the California Monitoring Program (CAMP; Hyland and Neff, 1988). Summary statistics (i.e., mean, standard deviation, minimum-maximum, frequency of occurrence) were computed to describe the biota residing at each platform. Separate cluster analyses (Bray Curtis similarity index) of the percent cover data and available count data were conducted. For analysis of entire platform legs, replicates on a leg were pooled. First, replicates within a depth zone were pooled and then a weighted average was computed based on the contribution of each depth zone on a particular leg.

To evaluate how benthic biota differ between zones, estimates of percent cover (and available count data) for individual biotic zones were used in a separate cluster analysis. The replicates within each biotic zone were pooled at individual platform legs, providing a means to evaluate the occurrence and similarities of the biotic zones. There was no weighting for the analysis of biotic zones. A reduced portion of the data set was also analyzed to compare

platform legs to the pinnacles. Because there was no distinct vertical zonation evident at the pinnacles, the data were pooled over the pinnacle and individual platform legs for the applicable depth zones. Specifically, only the samples occurring within the 5 to 17 m depth range from the platforms were used in this portion of the data analysis because these correspond to the depth range of the biota sampled at the pinnacles.

3.0 Results

3.1 Inspection Videotape Review

Biotic zonation patterns were determined based on a review of MMS inspection videotapes for each of the selected platforms (**Table 3-1**). MMS requires periodic observation, inspection, and characterization of a platform's jackets (legs) as part of routine facility maintenance; visual inspections typically include the use of photographs and/or videotapes. The depth and range characteristics of each platform's biotic zones, as established during inspection videotape review, were used in determining where discrete samples (e.g., photographs, scrapings) were to be taken during the field surveys. **Figures 3-1** through **3-3** show the zonation patterns evident from videotape analysis of platforms Gail and Grace, Harvest and Hidalgo, and Habitat and Irene, respectively.

A total of four to six distinct biotic zones (i.e., zonation patterns) were evident, depending on platform depth. As platform depth increased, the total number of biotic zones increased. Below the *Mytilus* zone, the expanse of each zone may also broaden. Platforms in shallower water (e.g., platforms Grace, Hidalgo, Habitat, and Irene) exhibited four or five zones, while the deeper platforms (e.g., platforms Gail and Harvest) provide additional vertical substrate for a sixth platform-associated community.

Based on inspection videotape review, several observations of platform-associated community structure were noteworthy:

- *Mytilus* was always present, therefore there was always a mussel zone whose vertical extent and lower boundary were quite variable;
- Barnacles were typically present above and/or below the mussel zone;
- Encrusters (e.g., sponges) were routinely present at depth, often in conjunction with various cnidarian species (e.g., *Metridium*, *Corynactis*, *Paracyathus*); and
- Beneath the intertidal, barnacle, and mussel zones, considerable variability in faunal composition was suggested.

In addition to identifying the extent and characteristics of each biotic zone during inspection videotape review, algal presence and extent (i.e., depth of occurrence) along the four outer legs of each platform was also determined. The approximate vertical extent of algal growth is depicted in **Figures 3-1** through **3-3**. Several platforms (i.e., Habitat, Hidalgo, Irene) had also been cleaned prior to filming of the inspection videotape. The time that had elapsed between cleaning and the current survey efforts was variable, ranging from several months to several years.

3.2 Field Surveys

A summary listing of platforms and rock outcrops sampled during the field surveys is provided in **Table 3-2**. Platform and rocky outcrop locations in the Santa Maria Basin and Santa Barbara Channel areas were provided previously (i.e., see **Figures 2-1** through **2-4**).

Table 3-1. Characteristics of platform biotic zones as determined during inspection videotape analysis.

Biotic Zone ¹	Zone Depth (m [ft] subsurface)	Vertical Extent (m [ft])
Primary Platforms -		
Platform Gail		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 12.1 (6 to 40)	10.3 (34)
Barnacle/Scallop	12.1 to 48.8 (40 to 160)	36.7 (120)
<i>Corynactis</i> /Encruster	48.8 to 115.8 (160 to 380)	67.0 (220)
Vase sponge/Encruster	115.8 to 192.0 (380 to 630)	76.2 (250)
Encruster/Sea Star/Cup Coral	192.0 to 225.2 (630 to 739)	33.2 (109)
Platform Grace		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 13.7 (6 to 45)	11.9 (39)
Barnacle/Scallop	13.7 to 27.4 (45 to 90)	13.7 (45)
Anemone/Encruster	27.4 to 70.1 (90 to 230)	42.6 (140)
Encruster/Sea Star	70.1 to 96.9 (230 to 318)	26.8 (88)
Platform Harvest		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 25.9 (6 to 85)	24.1 (79)
Barnacle/ <i>Corynactis</i>	25.9 to 50.3 (85 to 165)	24.4 (80)
Anemone/Encruster	50.3 to 105.2 (165 to 345)	54.9 (180)
Vase Sponge/Encruster	105.2 to 169.2 (345 to 555)	64.0 (210)
<i>Metridium</i> /Sea Star	169.2 to 205.7 (555 to 675)	36.6 (120)
Platform Hidalgo		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 19.8 (6 to 65)	18.0 (59)
Barnacle	19.8 to 32.0 (65 to 105)	12.1 (40)
<i>Metridium</i> /Encruster	32.0 to 109.7 (105 to 360)	77.7 (255)
Sponges/Encruster	109.7 to 132.3 (360 to 434)	22.5 (74)
Secondary Platforms -		
Platform Habitat		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 18.3 (6 to 60)	16.5 (54)
<i>Corynactis</i>	18.3 to 54.9 (60 to 180)	36.6 (120)
<i>Metridium</i> /Encruster	54.9 to 88.4 (180 to 290)	33.5 (110)
Platform Irene		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
Barnacle/Algae ²	1.8 to 10.7 (6 to 35)	8.8 (29)
<i>Mytilus</i>	10.7 to 25.9 (35 to 85)	15.2 (50)
<i>Corynactis</i> /Encruster	25.9 to 73.4 (85 to 242)	47.9 (157)

¹ Zonation patterns based on the results of inspection videotape review; zones verified via ROV observations.

² The barnacle/algae zone of Platform Irene represents an area recently cleaned; see Platform Irene analysis within this section.

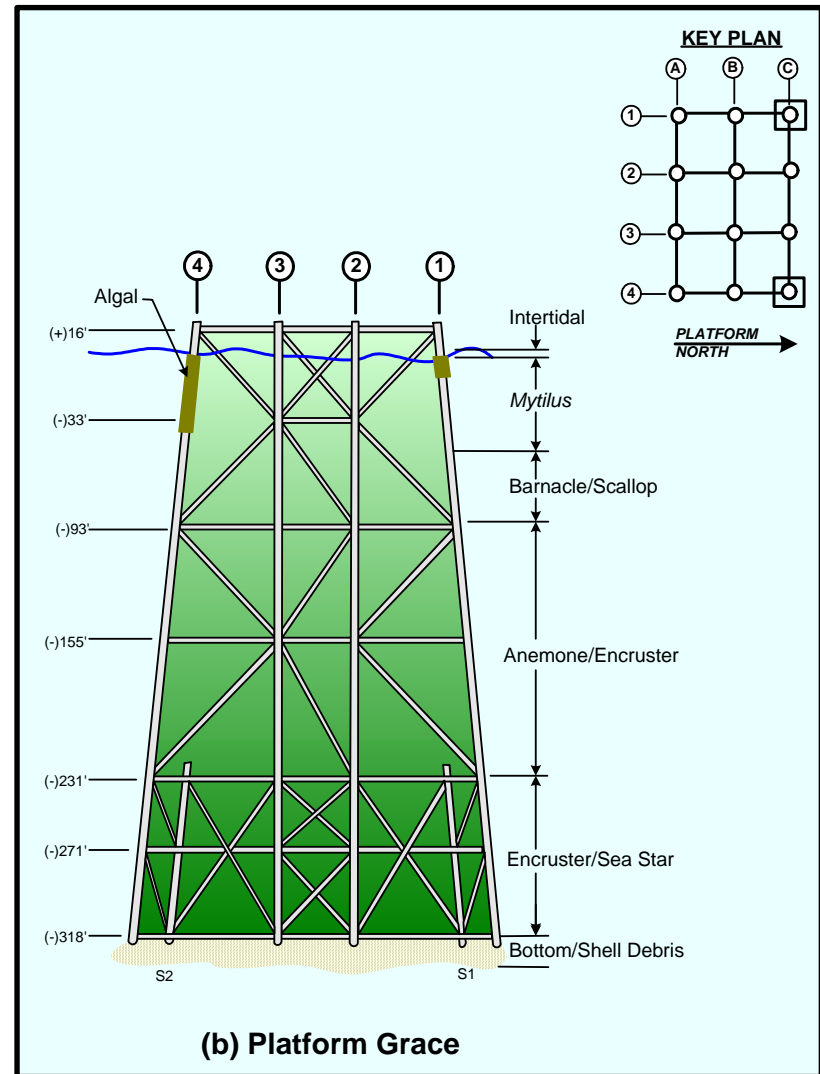
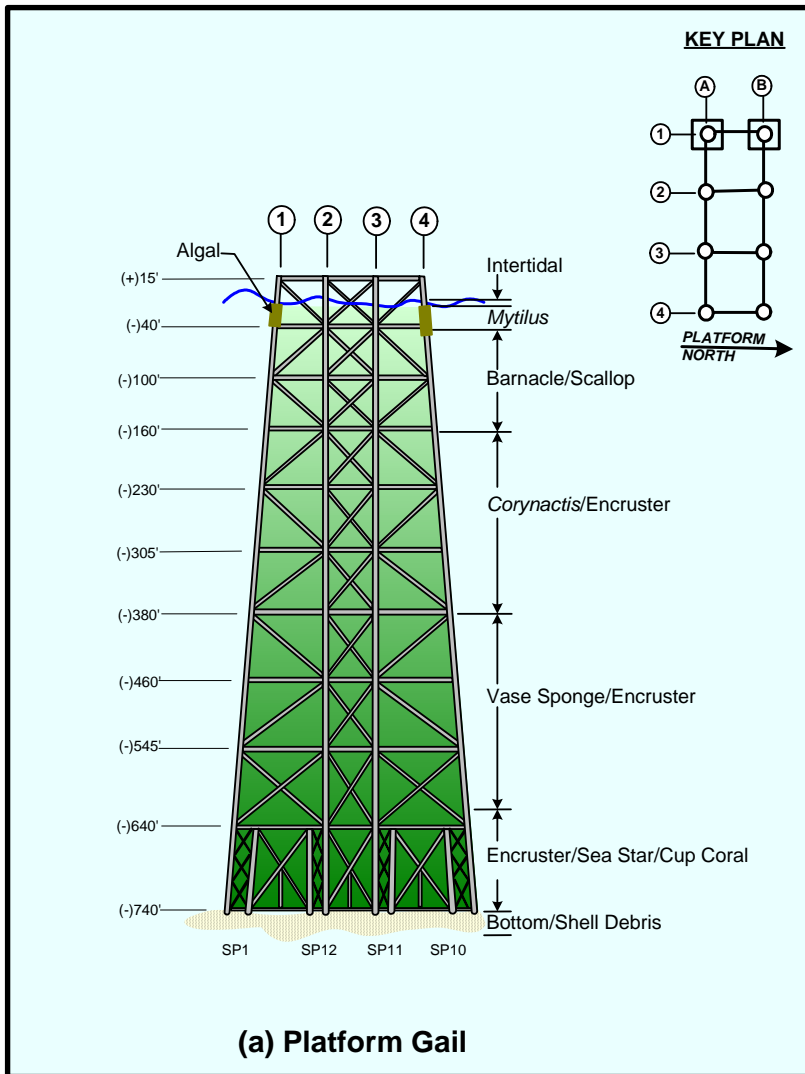


Figure 3-1. Zonation patterns evident from videotape analysis of (a) Platform Gail and (b) Platform Grace, as viewed from an outboard perspective. Squares in key plan denote legs analyzed.

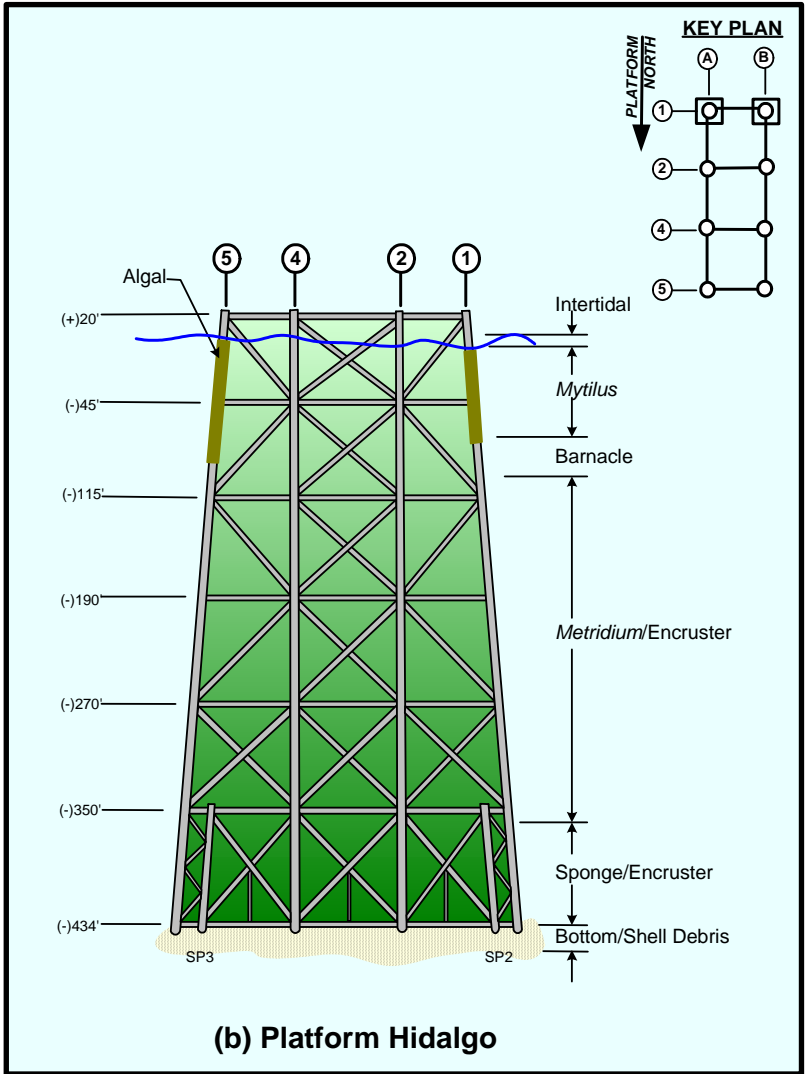
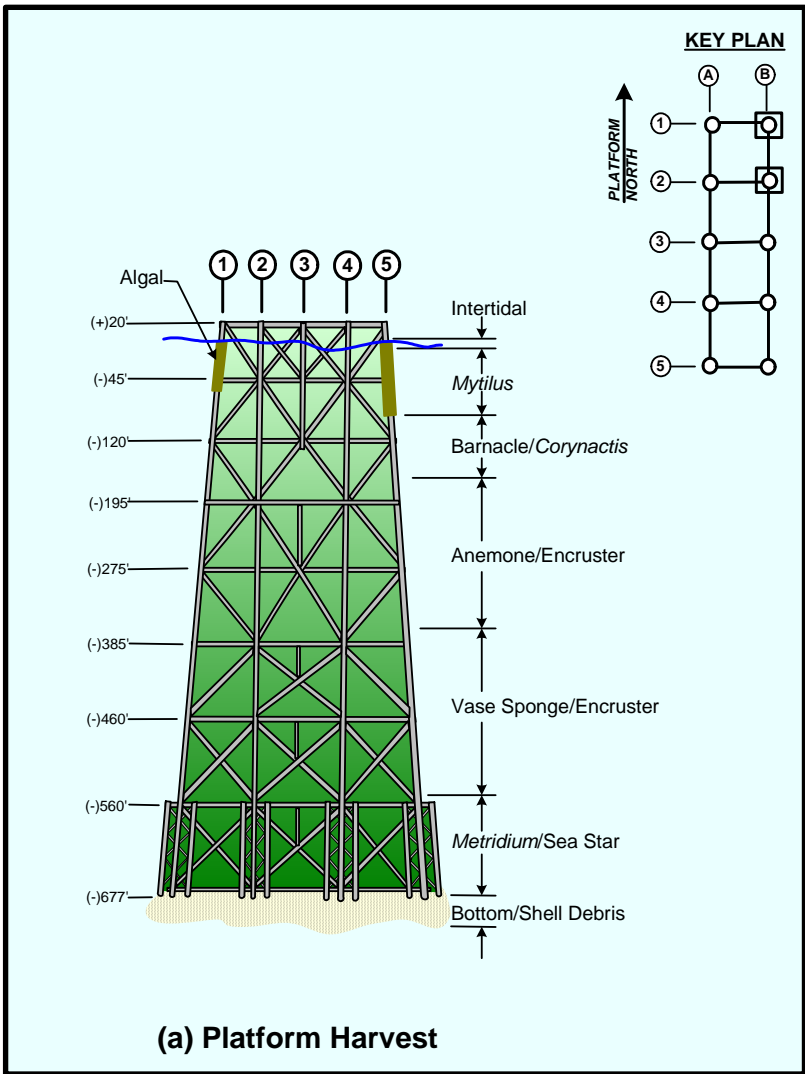


Figure 3-2. Zonation patterns evident from videotape analysis of (a) Platform Harvest and (b) Platform Hidalgo, as viewed from an outboard perspective. Squares in key plan denote legs analyzed.

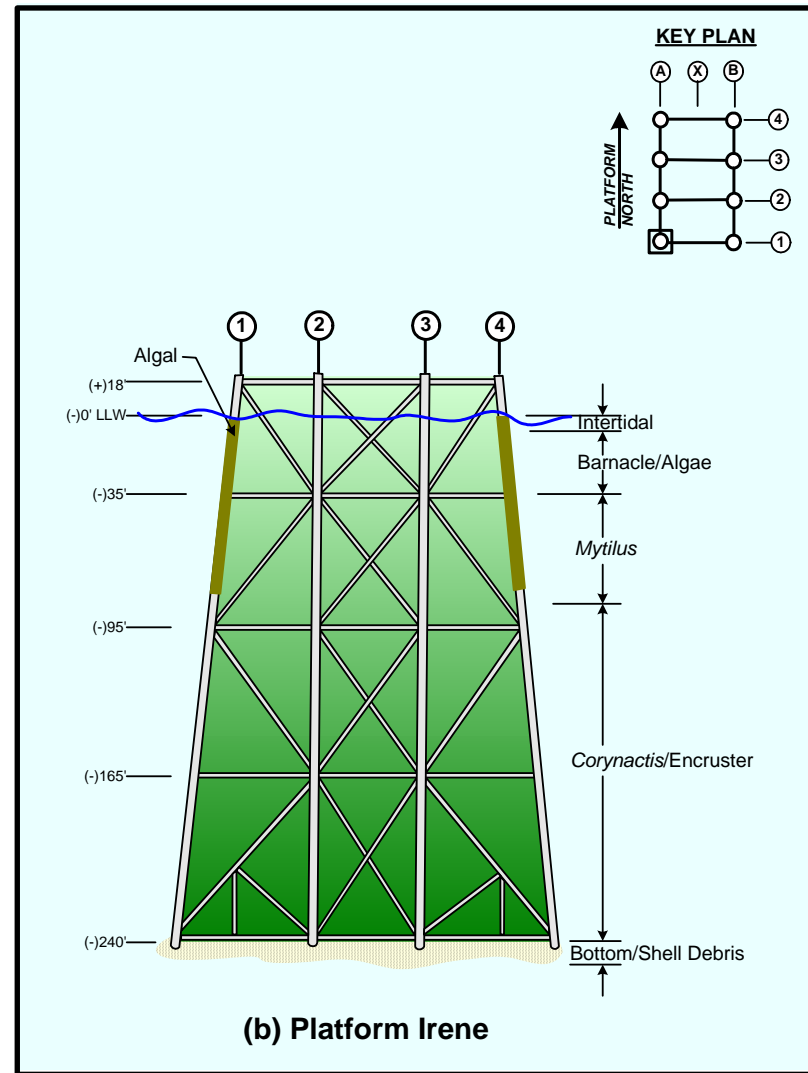
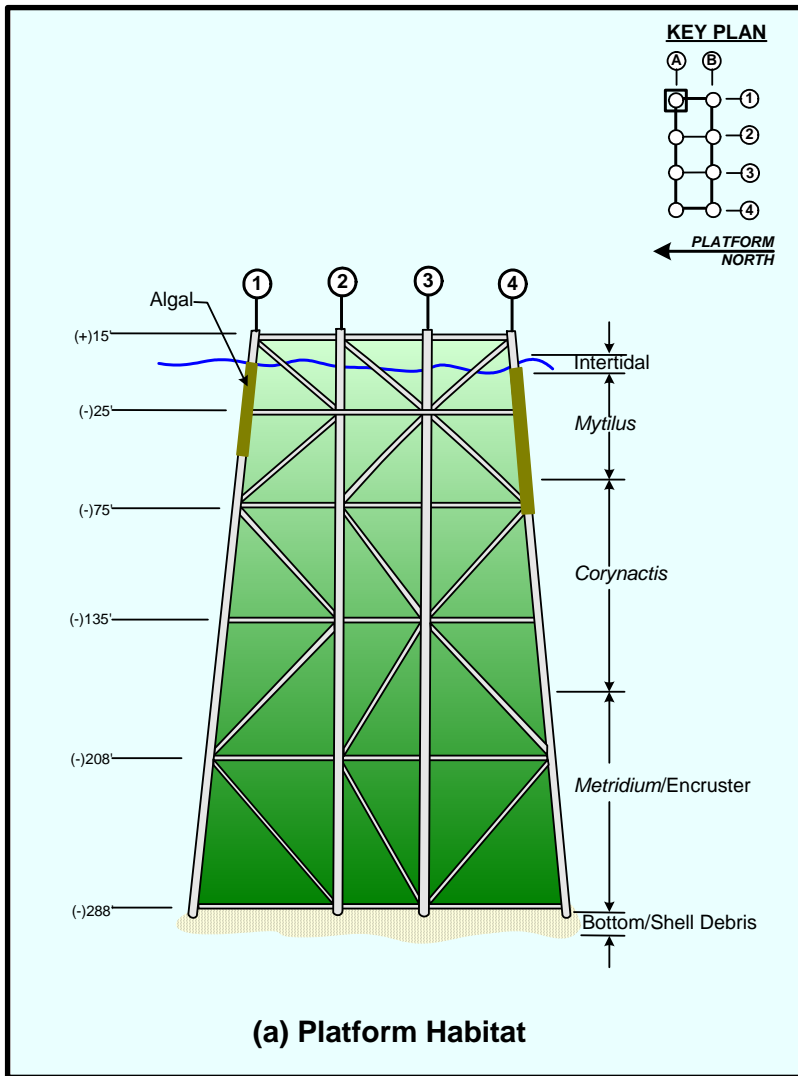


Figure 3-3. Zonation patterns evident from videotape analysis of (a) Platform Habitat and (b) Platform Irene, as viewed from an outboard perspective. Squares in key plan denote legs analyzed.

Table 3-2. Summary of platform legs and rocky outcrops sampled during the analysis of invertebrate and algal communities on offshore oil and gas platforms in southern California.

Platform	Location, Jacket Characteristics, and Water Depth	Dates Sampled	Leg(s) Sampled	Orientation ¹
<i>Primary Platforms</i>				
Gail	Eastern Santa Barbara Channel; 8 legs (2 x 4 design); deep (225 m; 739 ft)	16 Oct 00;	A1	SW
		19 Oct 00	B1	NW
Grace ²	Eastern Santa Barbara Channel; 12 legs (3 x 4 design); shallow (97 m; 318 ft)	23-24 Oct 99	C1	NW
			C4	NE
Harvest	Southern Santa Maria Basin; 10 legs (2 x 5 design); deep (206 m; 675 ft)	13-15 Nov 99	B1	NE
			B2	NE
Hidalgo	Southern Santa Maria Basin; 8 legs (2 x 4 design); shallow (132 m; 434 ft)	14-15 Nov 99	A1	SE
			B1	SW
<i>Secondary Platforms</i>				
Habitat	Eastern Santa Barbara Channel; 8 legs (2 x 4 design); shallow (88 m; 290 ft)	12-14 Oct 99;	A1	NE
		24 Oct 99		
Irene	Southern Santa Maria Basin; 8 legs (2 x 4 design); shallow (73 m; 242 ft)	3-5 Nov 00	A1	SW
<i>Offshore Rocks/Pinnacles</i>				
Diablo Rock ³	Western Santa Barbara Channel; Shallow (33 m; 108 ft)	11-12 Oct 98	NA	S
Nifty Rock ⁴	Western Santa Barbara Channel; Shallow (15 m; 50 ft)	12 Oct 98	NA	S

¹ Approximate orientation of the outer portion of the platform leg or rocky outcrop sampled.

² Platform Grace was sampled initially via ROV and diver during the Preliminary Survey (Legs C1 and C4), 18-20 October 1998 to test the photographic, videotape, and sample lift systems; subsequent sampling of this platform was conducted in October 1999; this latter data set was used in quantitative slide analyses.

³ Located in the Santa Barbara Channel region, several kilometers to the west of Diablo Point, off the northern coastline of Santa Cruz Island (northern Channel Islands).

⁴ Located in the Santa Barbara Channel region, several kilometers east-southeast of Harris Point, off the northwestern point of San Miguel Island (northern Channel Islands).

Given the proximity of certain platforms to one another and the weather considerations encountered, the following sampling sequence was realized:

- Diablo and Nifty Rocks (Rock Outcrops/Pinnacles);
- Eastern Santa Barbara Channel: platforms Gail, Grace, and Habitat; and
- Southern Santa Maria Basin platforms: platforms Harvest, Hidalgo, and Irene.

Note that legs that were actually sampled often differed slightly from those proposed for sampling (see **Table 2-2**) due to limitations imposed on the field survey crew (e.g., location of mooring buoy(s), predominant wind and swell direction). Field surveys were completed during a 25-month period between October 1998 and November 2000. A preliminary survey was completed in October 1998 to test the various diver and ROV systems and to complete sampling at the rock outcrop sites. Full surveys at six platforms were completed over a 13-month period between October 1999 and November 2000, as detailed in **Table 3-2**.

3.3 Platform Characterization – Photographic Interpretation

The following discussion provides a brief description of the physical characteristics of each of the sampled platforms and detailed descriptions of the communities present as determined from quantitative slide analysis (i.e., whole slide [or photograph] analysis).¹ The species and taxa identified at each discrete photographic site (i.e., photoquadrats sampled along the legs of six platforms and at two rocky outcrops) are provided in **Appendix C**.

Based on the identification and enumeration of all flora and fauna present in each photoquadrat, 149 taxa (i.e., species level or higher) were identified on the six platforms. An additional 24 taxa were observed on the rock outcrops (see **Section 3.4**), for a total of 173 taxa at all sites sampled. The composite species list included representatives from five invertebrate phyla – mollusks (e.g., *Mytilus*, *Triopha*), cnidarians (e.g., *Metridium*, *Corynactis*, *Anthopleura*), crustaceans (e.g., *Balanus*, *Pollicipes*, *Tetraclita*), polychaetes (e.g., worm tubes, *Protula*), and echinoderms (e.g., *Ophiothrix*), plus numerous minor phyla (e.g., sponges, bryozoans, tunicates) and undifferentiated assemblages. Various algae (e.g., green, red filamentous, red foliose) were also identified. Random point count (PointCount'99®) analysis using digital images created from the original 35-mm transparencies resulted in the identification of 55 taxa total (see **Section 3.5**).

Photographic analysis of all species present (i.e., quantitative slide analysis) provided an estimate of both total density and percent cover for all specimens present on each photograph (image area: 0.0625 m²). Individual counts are important as a means of identifying numerical dominants, determining relative species densities, and as one basis for comparing platform legs. Estimates of percent cover are important for those species where individual counts are more difficult to acquire or where counts may not be truly representative (e.g., with colonial taxa or major “community formers”; see Lessios, 1996). Percent cover estimates may also be used in a comparison of platform legs. Both measures were considered in the following analysis. Photographic interpretation of both primary and secondary platforms was based on species

¹ Data consist of 35-mm photographic slide transparencies and digital files created from each transparency; the terms slide and photograph are used interchangeably in the following discussion and may refer to one or both image forms.

presence, specifically density and percent cover estimates for each 0.0625 m² area photographed.

3.3.1 Platform Gail

Physical Characteristics

Platform Gail, operated by Venoco, Inc., is located on Lease OCS-P 0205 (Sockeye Field, Santa Clara Unit), approximately 16 km (8.6 nautical miles [nmi]) from shore in the eastern Santa Barbara Channel. This 8-legged platform was installed on 5 April 1987 in a water depth of 225 m (739 ft).

Community Description

Legs A1 and B1 were sampled at Platform Gail from the intertidal zone to the base of each platform leg. Based on complete analysis of 196 photographs from both legs, 74 taxa were identified, of which 39 percent (29) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with a few specimens enumerated at higher taxonomic levels. Only five floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Codium*; encrusting coralline algae; filamentous green algae; foliose red algae) were among the 74 total taxa observed.

On Leg A1, the six most dominant taxa (based on total density, in descending order) included *Corynactis californica*, *Metridium exilis*, *Metridium senile*, filamentous red algae, *Ophiothrix spiculata*, and *Mytilus* spp. (**Table 3-3**). While *Metridium senile* had the highest frequency of occurrence (70 out of 98 photographs), *Corynactis californica* and *M. exilis* exhibited highest average density per occurrence at 449 and 147 individuals/0.0625 m², respectively. In terms of percent cover, prevalent species on Leg A1 included (in descending order) *Corynactis californica*, *Mytilus* spp., *Metridium senile*, *Anthopleura elegantissima* (rosy morph), and *Metridium exilis*. Turf, a composite of smaller flora and fauna (including protozoa, hydrozoa, bryozoa, and algae) that co-occur with one another and coat the surface of the platform legs in an irregular manner, was also a prominent contributor to percent cover. While turf species were typically too small to distinguish individually at the scale of the photoquadrats, the presence of turf was readily identifiable in the photographs. Bare metal was also a prevalent feature on this leg at depths below 69 m (225 ft), extending to a point near the base of Leg A1 at 233 m (733 ft).

Based on videotape review, algal depth on Leg A1 extended from the upper portions of the intertidal zone to a maximum depth of approximately 8 to 11 m (25 to 30 ft). Results of whole slide analysis, however, indicated algal presence (dominated by filamentous red algae – *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.) extending to a depth of 17 m (55 ft).

On Leg B1, similar dominant species were evident as compared to Leg A1, with slight reordering among the top five taxa – *Metridium exilis*, *Corynactis californica*, *Metridium senile*, *Mytilus* spp., and filamentous red algae. *Metridium exilis* was the numerical dominant and a major contributor to percent cover, occurring in >60 percent of the photographs and prevalent in depths between 1 and 98 m (3 and 322 ft) on Leg B1 (**Table 3-4; Photo 1**).

Table 3-3. Dominant taxa (or physical characteristics) on Leg A1 of Platform Gail identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Corynactis californica</i>	15,263	448.9	34.7	2-693	34; 39; 53-216; 367; 372; 410
<i>Metridium exilis</i>	4,554	146.9	31.6	3-570	4-12; 24; 30-45; 53-55; 75; 104; 131-134
<i>Metridium senile</i>	4,227	60.4	71.4	1-213	4-9; 14-24; 30-34; 38-68; 87-89; 104-118; 225-646; 664-721; 733
Filamentous red algae	752	27.9	27.6	2-70	4-9; 14; 18-21; 30-42; 48-55
<i>Ophiothrix spiculata</i>	533	24.2	22.4	2-66	21; 31-34; 36-38; 131; 309-326; 367-577
<i>Mytilus</i> spp.	497	35.5	14.3	3-160	4-9
<i>Desmophyllum dianthus</i>	416	21.9	19.4	1-54	363; 410; 620-675; 679-733
<i>Anthopleura elegantissima</i> (rosy morph)	305	20.3	15.3	1-100	4; 6; 7-18; 28; 31-34
<i>Balanus</i> spp.	145	9.1	16.3	1-30	3-57
Ophiuroid, unidentified	113	7.5	15.3	1-34	36; 42-48; 61-63; 84-89; 137; 162-168; 184; 225-231
<i>Metridium farcimen</i>	103	11.4	9.2	1-88	131; 162-168; 184-216; 231; 660
Worm tubes, plain	62	8.9	7.1	2-23	302-367; 346-360
Percent Cover:					
<i>Corynactis californica</i>		64.0	34.7	1-98	34; 39; 53-216; 367; 372; 410
<i>Mytilus</i> spp.		60.4	14.3	5-90	4-9
<i>Metridium senile</i>		41.7	71.4	1-95	4-9; 14-24; 30-34; 38-68; 87-89; 104-118; 225-646; 664-721; 733
Bare Metal		33.3	38.8	2-66	225-733
<i>Anthopleura elegantissima</i> (rosy morph)		26.4	15.3	0.5-100	4; 6; 7-18; 28; 31-34
<i>Metridium exilis</i>		23.0	31.6	1-80	4-12; 24; 30-45; 53-55; 75; 104; 131-134
Zoanthid, colonial tan		10.0	2.0	5-15	620; 633
Turf		6.0	35.7	0.4-25	39; 48; 55-61; 68-75; 91; 118-137; 162-363; 646-664; 677-692
Hydroid, tan branching		5.8	6.1	5-10	4-6; 7; 9
Sponge, tan encrusting		4.0	31.6	0.5-15	12; 24; 30-34; 36-38; 42; 63-70; 75-91; 104-118; 131-184; 231; 309; 397; 660
Tunicate, encrusting tan		3.0	1.0	3	675
Sponge, orange encrusting		2.9	6.1	0.5-10	12; 21-24; 30; 36; 39

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Ninety-eight (98) photographs were analyzed from Leg A1.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.

Table 3-4. Dominant taxa (or physical characteristics) on Leg B1 of Platform Gail identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Metridium exilis</i>	20,739	340.0	62.2	2-580	3-71; 74-231; 308-322; 518
<i>Corynactis californica</i>	3,035	159.7	19.4	1-630	57-59; 63-99; 127; 141; 153; 261-294; 315-322
<i>Metridium senile</i>	1,669	38.8	43.9	1-169	3-5; 58-60; 261-294; 309-689; 700-704; 734-736
<i>Mytilus</i> spp.	607	24.3	25.5	2-87	3-14; 18-28; 34-36; 42-53
Filamentous red algae	277	11.1	25.5	1-30	6-9; 14-53; 59-60
<i>Desmophyllum dianthus</i>	210	12.4	17.3	2-37	594-602; 630-734
<i>Ophiothrix spiculata</i>	206	15.8	13.3	1-51	59-60; 63; 86-97; 123; 363; 376; 454-492
<i>Balanus</i> spp.	180	9.5	19.4	1-25	3-9; 21; 30; 33-34; 42; 57
Worm tubes, calcareous	158	11.3	14.3	1-26	231-420; 734
<i>Protula superba</i>	155	11.9	13.3	1-28	261-420; 518
Worm tubes, plain	124	5.6	22.4	1-27	308-420; 594; 615; 662-678; 684; 698-700; 708; 732-736
<i>Amphipholis</i> spp.	82	4.3	19.4	1-9	500-689; 700-713
Percent Cover:					
<i>Metridium exilis</i>		62.0	62.2	1-95	3-71; 74-231; 308-322; 518
Bare Metal		49.2	42.9	2-85	8-9; 24; 276-736
<i>Metridium senile</i>		31.8	43.9	1-84	3-5; 58-60; 261-294; 309-689; 700-704; 734-736
<i>Halichondria panicea</i>		30.0	1.0	30 (max)	34
<i>Corynactis californica</i>		22.8	19.4	0.5-90	57-59; 63-99; 127; 141; 153; 261-294; 315-322
<i>Mytilus</i> spp.		19.2	25.5	5-85	3-14; 18-28; 34-36; 42-53
Sponge, tan encrusting		10.5	34.7	0.5-50	3-6; 28; 31-33; 38; 58-73; 99-103; 127-146; 153
<i>Leucetta</i>		10.0	2.0	10	24; 60
Sponge, tan globose		10.0	1.0	10	36
Sponge, cup tan		9.9	6.1	0.5-46	78; 123; 143; 594; 700; 708
Turf		8.4	46.9	0.5-30	97; 123; 168-460; 492-736
Zoanthid, tan (<i>Palythoa</i>)		6.8	5.1	2-15	518; 594; 680-684; 713

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Ninety-eight (98) photographs were analyzed from Leg B1.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.

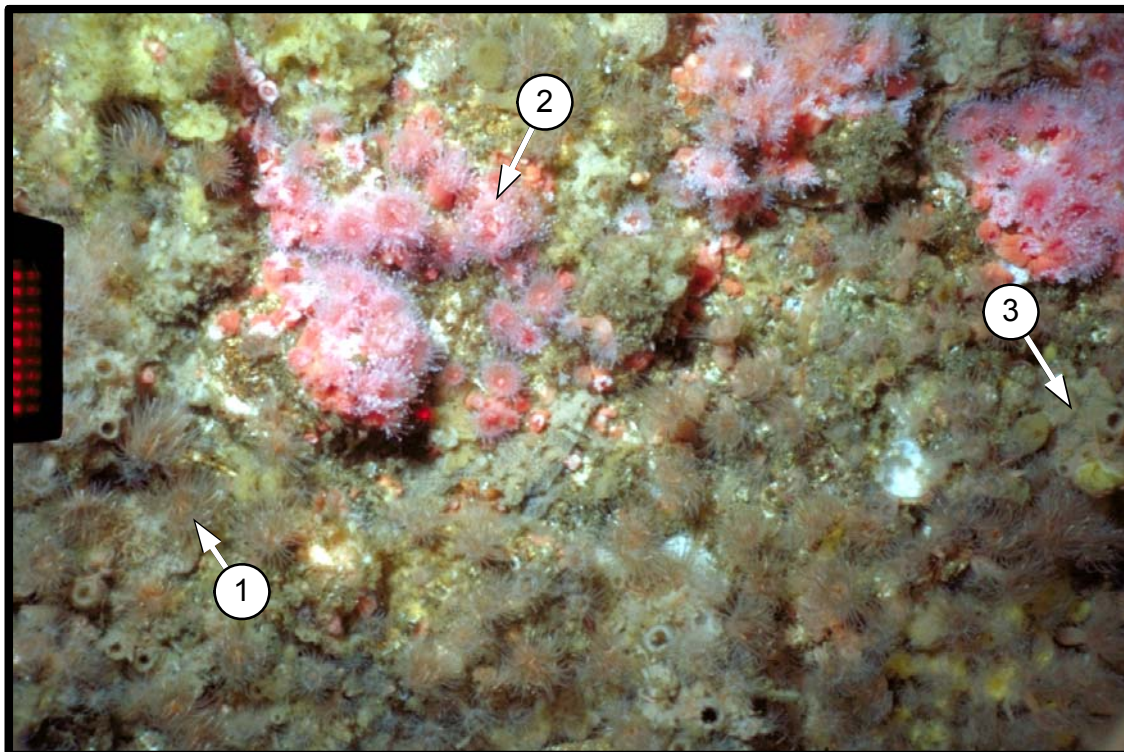


Photo 1. View of (1) *Metridium exilis*, (2) *Corynactis californica*, and (3) tan and yellow encrusting sponges at -47 m (-153 ft), Leg B1, Platform Gail.

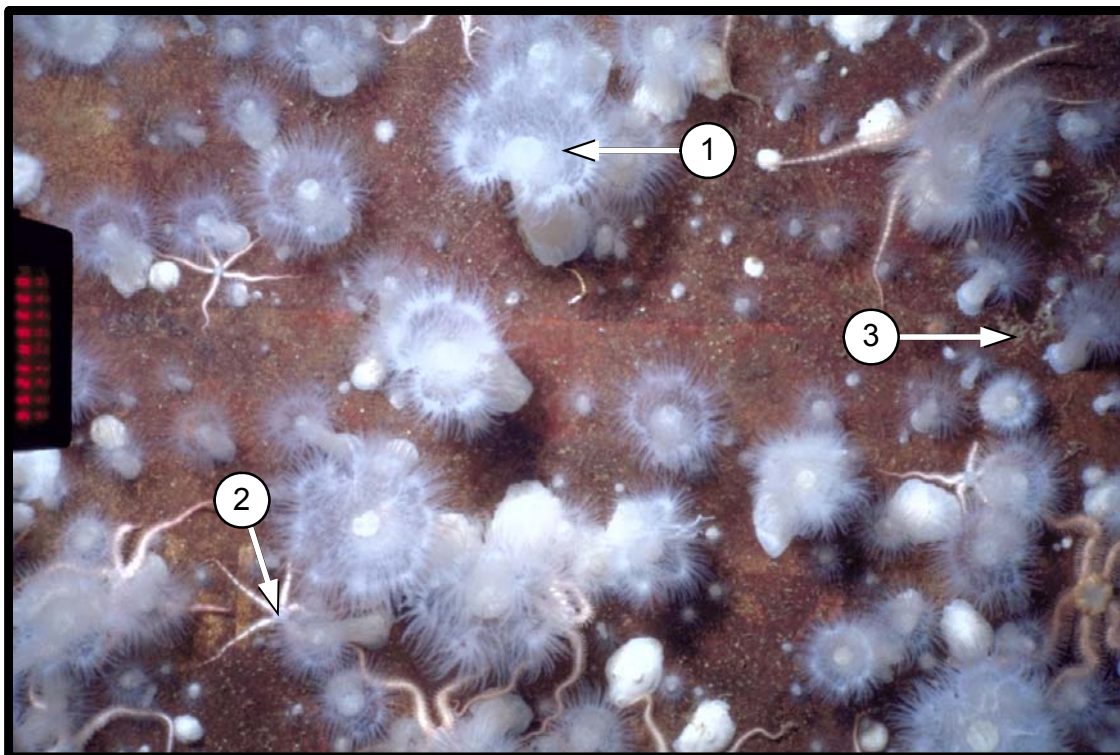


Photo 2. View of (1) *Metridium senile*, (2) *Amphipholis* spp., and (3) turf at -152 m (-500 ft), Leg B1, Platform Gail.

On Leg A1, *M. exilis* species was the second most abundance species, but more intermittently distributed and, when present, in lower average abundance (146.9 individuals/0.0625 m²). On Leg B1, this species occurred from the shallowest stations to a depth of 70 m (231 ft), and again in a narrow band at approximately 93 to 98 m (305 to 322 ft). On Leg A1, *M. exilis* was present from the shallowest stations to a depth of 17 m (55 ft), then intermittently down to 41 m (134 ft) below the surface. This might be explained by fortuitous settling on newly cleaned areas in shallow water by a colony already established in deeper water. Maximum density for this species was 580 individuals, or 9,280 individuals/m². *M. exilis* also exhibited the highest mean percent cover among taxa on Leg B1 (**Table 3-4**).

A second cnidarian species, *Metridium senile*, occurred in nearly 60 percent of the photographs from Legs A1 and B1, ranging in depth from the shallow subtidal to the foot of the platform (**Tables 3-3 and 3-4; Photo 2**). Maximum density for *M. senile* in a single photograph was 213 individuals (3,408 individuals/m²). Of particular note, *Metridium* was a predominant faunal element in zones below 69 m (225 ft). In deeper portions of the legs, *Desmophyllum* was evident below 110 m (360 ft) on Leg A1, and prevalent below 183 m (600 ft) on both legs.

Review of inspection videotapes suggested that algal depth on Leg B1 extended from the upper portions of the intertidal zone to a maximum depth of approximately 8 to 9 m (25 to 30 ft). Results of whole slide analysis, however, indicated algal presence (dominated by filamentous red algae – *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.) extending to a depth of 18 m (60 ft).

A well-defined *Mytilus* zone was noted on Platform Gail, with frequent occurrence between 0.9 and 16 m (3 and 53 ft) (**Tables 3-3 and 3-4; Photo 3**). Maximum abundance of *Mytilus* was 160 individuals/0.0625 m², or 2,758 individuals/m², found at a depth of 1 m (4 ft) on Leg A1. *M. exilis* and filamentous red algae were also noticeable dominants within the *Mytilus* zone at Platform Gail. Dominant taxa on both legs, based on percent cover estimators, included *Metridium* (both *M. exilis* and *M. senile*), *Corynactis californica* (**Photo 4**), and *Mytilus* spp. (**Tables 3-3 and 3-4**). The high occurrence and significant percent cover contribution of *M. exilis*, *C. californica*, and *M. senile* were expected given their density dominance noted previously.

While results of the inspection videotape review suggested the presence of a prominent barnacle/scallop zone on Platform Gail, a total of only eight *Crassadoma gigantea* were noted on both legs during photographic analysis. This may be attributed to one or more factors, including a dense overgrowth of the strawberry anemone, *C. californica*, which effectively covers and blocks the view of underlying scallops. *C. californica* was a dominant species, by density and percent cover, on both legs and prevalent in water depths where *Crassadoma* had previously been documented (i.e., 12 to 49 m; 40 to 160 ft).

The relative densities (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present on Legs A1 and B1 are depicted in **Figures 3-4 and 3-5**. Platform Gail exhibited a well-defined *Mytilus* zone, a broadly distributed anthozoan community (*Metridium* and others, termed the "anthozoan mix"), and several abundant species that were also present on most other platforms (e.g., filamentous red algae, *O. spiculata*, *Balanus* spp., *C. californica*).



Photo 3. View of (1) *Mytilus* spp., (2) *Metridium senile*, and some (3) *Metridium exilis* at -1 m (-4 ft), Leg B1, Platform Gail.

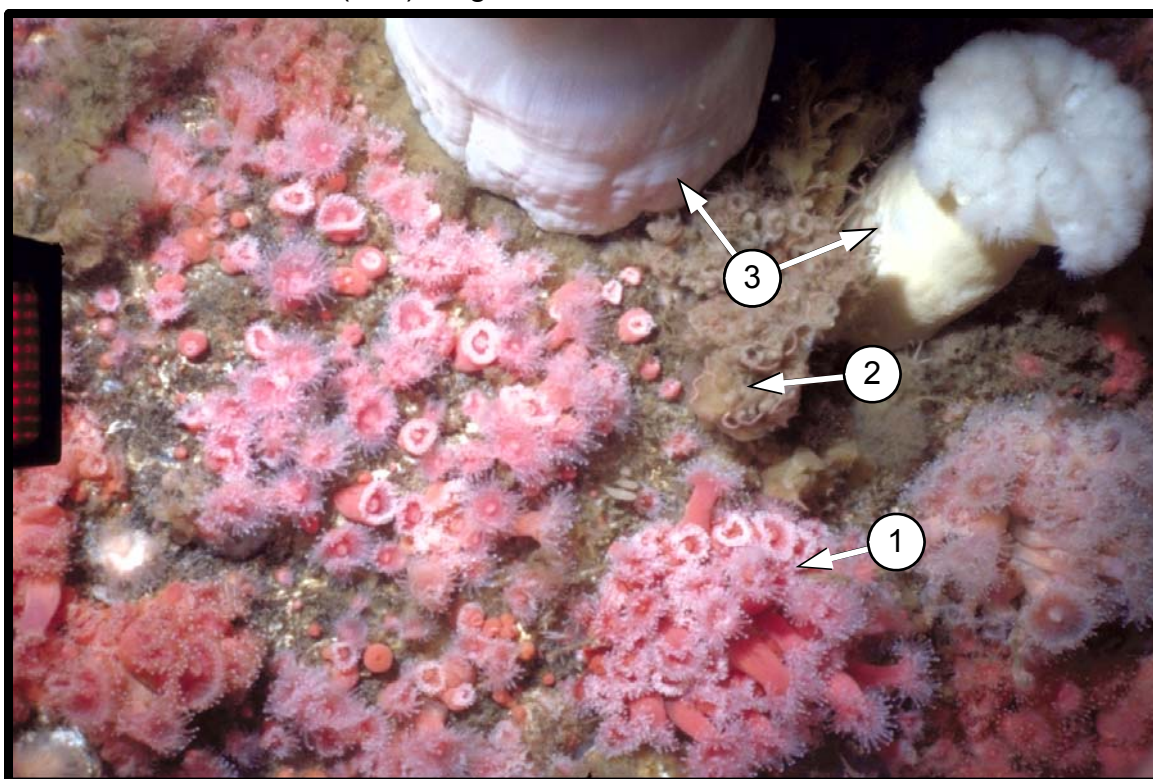


Photo 4. View of (1) *Corynactis californica*, (2) tan encrusting sponge, and (3) *Metridium farcimen* at -51 m (-168 ft), Leg A1, Platform Gail.

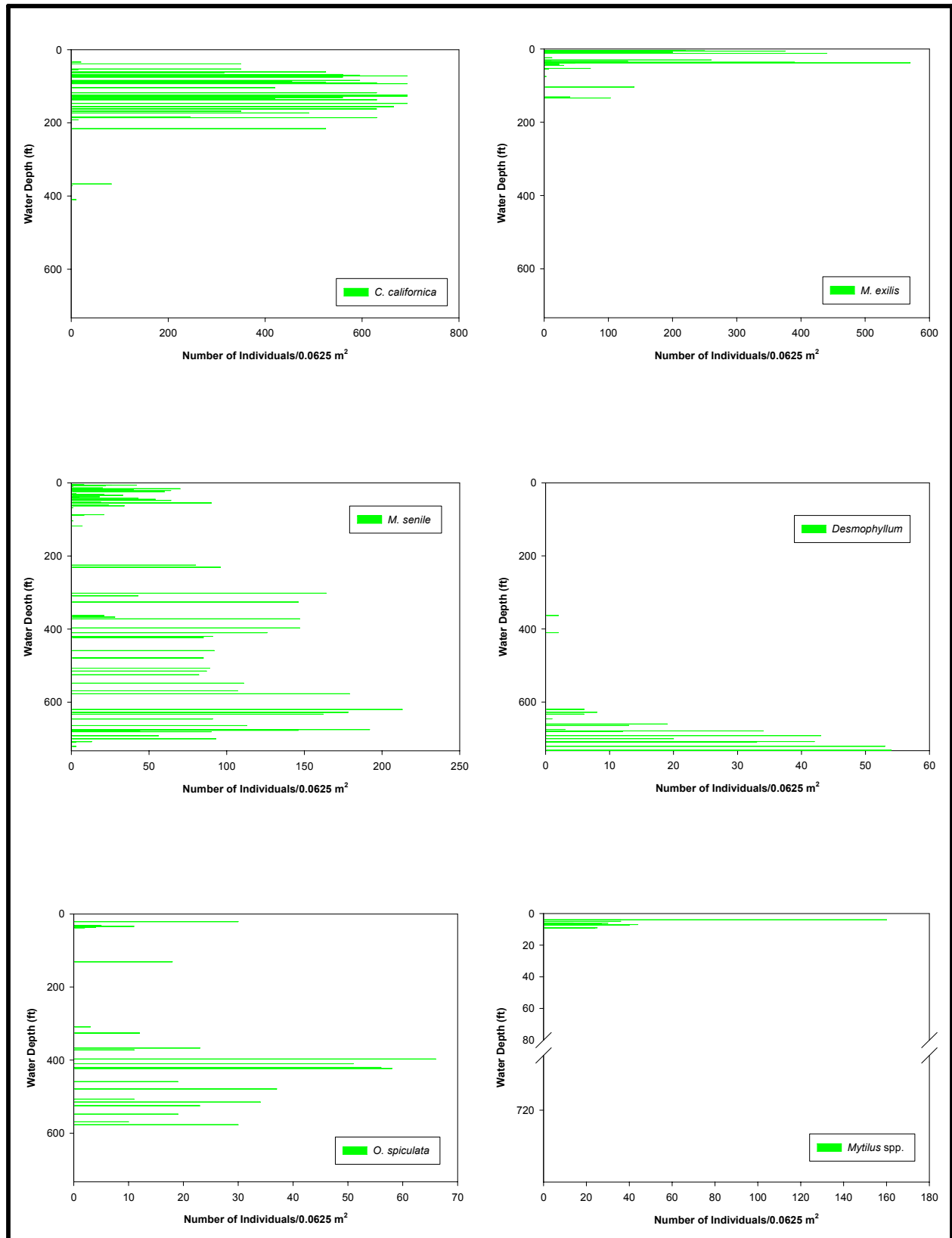


Figure 3-4. Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Gail determined from quantitative slide analysis.

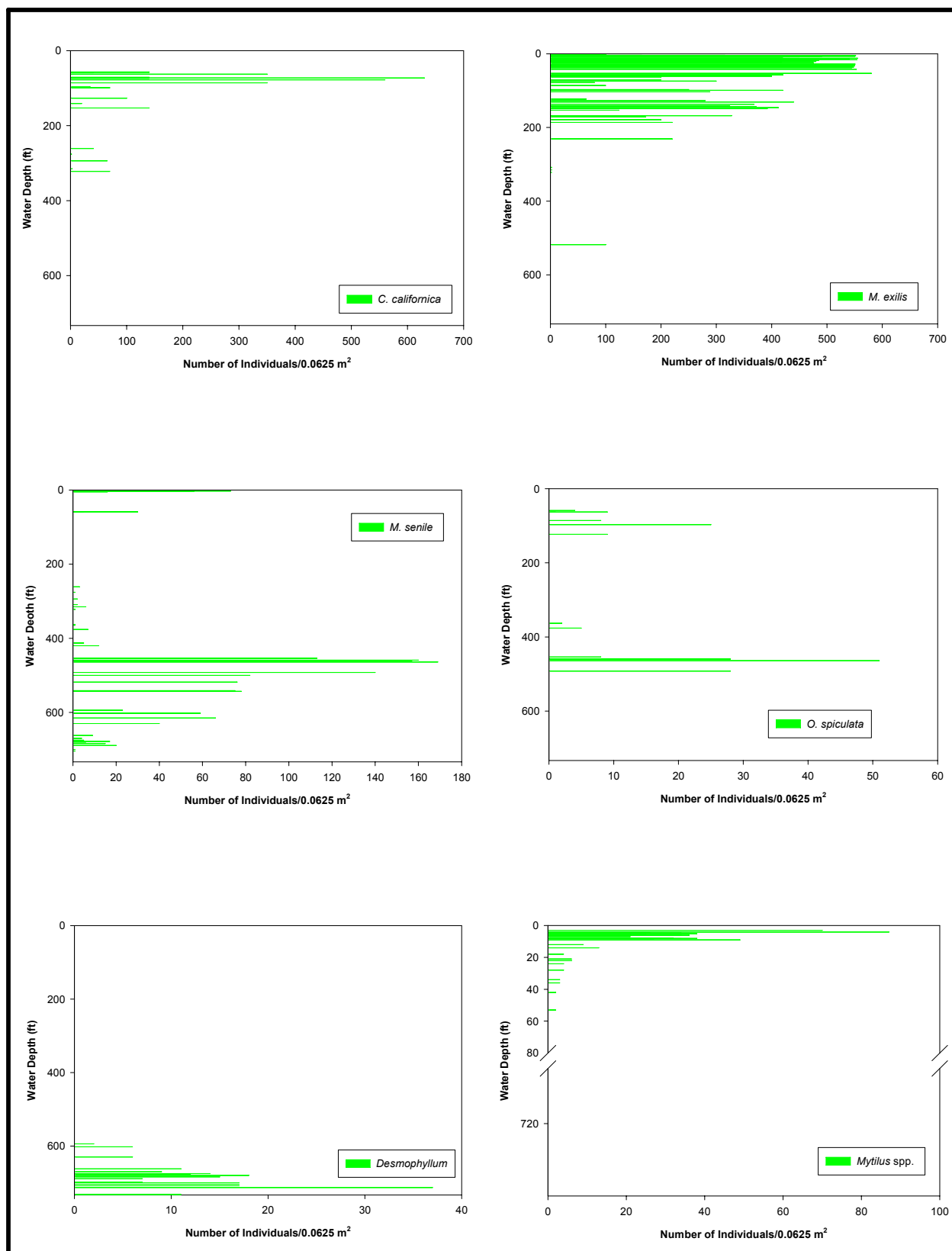


Figure 3-5. Density and depth distribution of the six numerically dominant taxa on Leg B1 of Platform Gail determined from quantitative slide analysis.

In terms of unique characteristics, Platform Gail exhibited (1) an unusual trend, specifically notable in the species identified within the anthozoan mix – the presence of dense colonies of *Metridium exilis*; (2) a *Desmophyllum* zone evident along the lower portions of both Legs A1 and B1; and (3) *Corynactis californica*, usually a dominant species at depth, was supplanted by *M. exilis* on Leg B1.

3.3.2 Platform Grace

Physical Characteristics

Platform Grace, operated by Venoco, Inc., is located on Lease OCS-P 0217 (Santa Clara Field, Santa Clara Unit), approximately 17 km (9.2 nmi) from shore in the eastern Santa Barbara Channel. This 12-legged platform was installed on 30 July 1979 in a water depth of 97 m (318 ft).

Community Description

Legs C1 and C4 were sampled at Platform Grace from the intertidal zone to the base of each platform leg. Based on analysis of 150 photographs, 48 taxa were identified, of which 46 percent (22) were monospecific taxa (i.e., species level identification). Remaining taxa were identified to genus level or higher. Only two floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Ulva lactuca*) were among the 48 total taxa observed.

The six most dominant taxa present on Leg C1 (based on total density, in descending order) included *Corynactis californica*, *Paracyathus stearnsii*, *Mytilus* spp., *Ophiothrix spiculata*, *Balanus* spp., and the rosy morph form of *Anthopleura elegantissima* (Table 3-5). While *O. spiculata* was most frequently observed on Leg C1, occurring in 37 of 73 photographs, *C. californica* exhibited the highest mean densities (212 individuals/0.0625 m²), nearly two and half times more dense than the second most numerically dominant taxa – *Mytilus* spp. A well-defined *Mytilus* zone was evident between the intertidal and 6 m (19 ft).

Dominant taxa present on Leg C1 in terms of percent cover included *Mytilus* spp., *Corynactis californica*, turf, *Anthopleura elegantissima* (rosy morph), an unidentified tan hydroid, filamentous red algae, and bryozoa turf. Several of these species exhibited both numerical dominance (i.e., higher densities) and higher percent cover contributions, suggesting that they were major community formers at Platform Grace.

Results of videotape analysis suggested that algae on Leg C1 of Platform Grace extended from the intertidal to a depth of 1 m (4 ft). Results of whole slide analysis, however, indicated algal presence (dominated by filamentous red algae – *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.) in a near continuous band to 11 m (35 ft), with limited occurrence down to 19 m (61 ft).

Table 3-5. Dominant taxa (or physical characteristics) on Leg C1 of Platform Grace identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Corynactis californica</i>	5,720	211.9	37.0	1-450	30; 35; 38-153; 172
<i>Paracyathus stearnsii</i>	2,085	71.9	39.7	1-201	111-308
<i>Mytilus</i> spp.	1,357	79.8	23.3	13-190	3-8; 10-19
<i>Ophiothrix spiculata</i>	987	26.7	50.7	1-180	3-4; 6; 8-16; 24-28; 31-61; 87-88; 93-148; 153; 238-242; 249; 256
<i>Balanus</i> spp.	627	27.3	31.5	1-68	3-25
<i>Anthopleura elegantissima</i> (rosy morph)	441	25.9	20.5	1-62	8-35
<i>Mytilus californianus</i>	124	62.0	2.7	60-64	7-8
Worm tubes, calcareous	90	4.7	26.0	1-10	144; 150; 205-308
<i>Coenocyathus bowersi</i> (c)	89	6.8	17.8	1-21	81; 119-205
Turf	64	1.0	87.7	1 (max)	3-6; 8; 15-38; 58-77; 87-308
<i>Metridium senile</i>	54	10.8	6.8	1-36	3-4; 8; 153
Filamentous red algae	25	1.0	34.2	1 (max)	3-30; 34-35; 61
Percent Cover:					
<i>Mytilus</i> spp.		49.1	23.3	5-80	3-8; 10-19
<i>Corynactis californica</i>		42.6	37.0	0.5-95	30; 35; 38-153; 172
Turf		37.4	87.7	1-97	3-6; 8; 15-38; 58-77; 87-308
<i>Anthopleura elegantissima</i> (rosy morph)		30.8	20.5	0.5-90	8-35
Hydroid, tan		25.0	1.4	25-25	10
Filamentous red algae		21.2	34.2	0.5-50	3-30; 34-35; 61
Bryozoa turf		20.0	1.4	20-20	7
Sponge, gray encrusting		16.7	4.1	10-25	38; 81-84
Hydroid, tan branching		15.5	5.5	2-30	7-8; 148
Sponge, yellow encrusting		11.3	24.7	1-30	55-65; 73-148
Sponge, tan encrusting		9.8	27.4	1-50	15-24; 28-35; 52-55; 61; 84; 88; 119; 131; 144-148; 153
Bare metal		7.5	2.7	5-10	256; 307

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. *Balanus* spp. and *Balanus* sp. combined for this tabular presentation (see Appendix C). Seventy-three (73) photographs were analyzed from Leg C1.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.; *Coenocyathus bowersi* is a colonial (c) species.

The six most dominant taxa present on Leg C4 (based on total density, in descending order), included *Corynactis californica*, *Mytilus* spp., *Ophiothrix spiculata*, *Metridium senile*, *Balanus* spp., and *Paracyathus stearnsii* (**Table 3-6**). Dominant species on Leg C4 were similar, with the exception of *Metridium senile*, to those documented from Leg C1. *O. spiculata* was most frequently observed on Leg C4, occurring in 33 of 77 photographs, while *C. californica* exhibited the highest mean densities (344 individuals/0.0625 m²). *Mytilus* occurred in two bands on Leg C4, with presence in depths of 1 to 4 and 10 to 12 m (3 to 14 and 33 to 39 ft). Dominant taxa present on Leg C4 in terms of percent cover included *Corynactis californica*, *Mytilus* spp., *Metridium senile*, a colonial tan zoanthid, turf, and an unidentified tan hydroid. Most of these species exhibited both numerical dominance and higher percent cover contributions, again suggesting that they were major community formers at Platform Grace.

Results of videotape analysis indicated that algae on Leg C4 of Platform Grace extended from the intertidal to a depth of approximately 12 m (40 ft). Results of whole slide analysis indicated algal presence slightly deeper. Dominated by filamentous red algae (e.g., *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.), algae occurred in a nearly continuous band between 1 and 15 m (4 and 49 ft). *Corynactis californica* was a prevalent species at Platform Grace, dominating on both legs in terms of total density and average density per occurrence, and was a major contributor to percent cover, exceeded only by turf on Leg C1. This species was dominant in water depths between 9 and 58 m (30 and 190 ft). *Mytilus* was also a prevalent species at Platform Grace, present within nearly all photographs between 0.9 and 12.2 m (3 and 40 ft). Highest numbers were evident between 0.9 and 2.7 m (3 and 9 ft), with densities tapering off with increasing depth. Maximum mussel abundance was 240 individuals/0.0625 m², or 3,840 individuals/m², the highest recorded among the six platforms. Filamentous red algae and barnacles were also co-dominants within the mussel zone and regularly co-occurred in photographs with mussels (**Table 3-5; Photo 5**).

Another dominant species at Grace, the ophiuroid *Ophiothrix spiculata*, was prevalent at depths between 0.9 and 78 m (3 and 256 ft), overlapping a portion of the mussel zone and extending across the barnacle/scallop and anemone/encruster zones. Highest ophiuroid abundance was 180 individuals/0.0625 m², with highest concentrations evident between 0.9 and 15.2 m (3 and 50 ft). *O. spiculata* co-occurred with another dominant, the strawberry anemone *C. californica*, below the mussel zone between 9.1 and 61 m (30 and 200 ft) (**Photo 6**). The solitary cup coral, *Paracyathus stearnsii*, and turf were also dominant numerically between approximately 30.5 and 91.4 m (100 and 300 ft). Considerable leg-to-leg differences were also evident for this hexacoral species, with Leg C4 consistently higher in *Paracyathus* abundance than Leg C1. *Coenocyathus bowersi* (hexacoral), another dominant, co-occurred with *Paracyathus* between 36 and 62 m (119 and 205 ft) water depths (**Photo 7**).

Percent cover contributions on both legs were led by *Corynactis* and *Mytilus*, and *Metridium*. Additionally, two other cnidarian taxa (i.e., *Coenocyathus* and the tan colonial zoanthid) were noted as percent cover dominants within select depth ranges (**Table 3-6**). Reduced abundance and species diversity were evident with increasing depth at Platform Grace. Along the lower portions of the platform, below approximately 70 m (230 ft), *Paracyathus* and turf predominate along with *Ophiothrix* (tapers off at 76 m [250 ft]) and occasional larger predatory starfish (e.g., *Asterina*, **Photo 8**).

Table 3-6. Dominant taxa (or physical characteristics) on Leg C4 of Platform Grace identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Corynactis californica</i>	7,917	344.2	29.9	10-500	39; 57-150; 191
<i>Mytilus</i> spp.	1,824	76.0	31.2	4-240	3-14; 33-39
<i>Metridium senile</i>	1,769	43.1	53.2	1-165	3-8; 28-61; 250-310
<i>Ophiothrix spiculata</i>	1,548	46.9	42.9	2-180	6-67; 72-74; 87; 99; 133-146
<i>Balanus</i> spp.	548	24.9	28.6	1-100	3-26; 29
<i>Paracyathus stearnsii</i>	214	26.8	10.4	1-57	133-197
<i>Anthopleura elegantissima</i> (rosy morph)	191	13.6	18.2	2-30	3; 6-9; 11-29
<i>Metridium exilis</i>	97	32.3	3.9	15-60	67; 72-74;
<i>Metridium farcimen</i>	71	6.5	14.3	1-18	130; 146-193; 202; 255; 271-277
Turf	46	1.0	59.7	1 (max)	3-12; 14-28; 39-42; 49; 61-85; 133-250; 264; 266-271; 278-310
<i>Balanus nubilus</i>	39	2.8	18.2	1-8	49; 61; 76-133
Filamentous red algae	24	1.0	31.2	1 (max)	4-26; 33; 39-40; 49
Percent Cover:					
<i>Corynactis californica</i>		69.2	29.9	2-100	39; 57-150; 191
<i>Mytilus</i> spp.		52.6	31.2	5-85	3-14; 33-39
Zoanthid, colonial tan		37.6	9.1	3-90	197; 255; 277-285; 299
<i>Metridium senile</i>		36.6	52.3	0.5-80	3-8; 28-61; 250-310
Turf		25.6	59.7	1-90	3-12; 14-28; 39-42; 49; 61; 85; 133-250; 264; 266-271; 278-310
Hydroid, tan		18.2	14.3	5-60	29-39; 42
Filamentous red algae		16.7	31.2	1-50	4-26; 33; 39-40; 49
<i>Cliona</i> spp., yellow		10.0	2.6	10	28; 39
Anthozoa, unidentified		10.0	1.3	10	202
<i>Anthopleura elegantissima</i> (rosy morph)		8.7	18.2	1-20	3; 6-9; 11-29
Bare Metal		8.4	6.5	2-15	3-4; 255; 277; 310
Sponge, tan encrusting		6.6	6.6	1-10	72-74; 133; 165; 250

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. *Balanus* spp. and *Balanus* sp. combined for this tabular presentation (see Appendix C). Seventy-seven (77) photographs were analyzed from Leg C4.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.

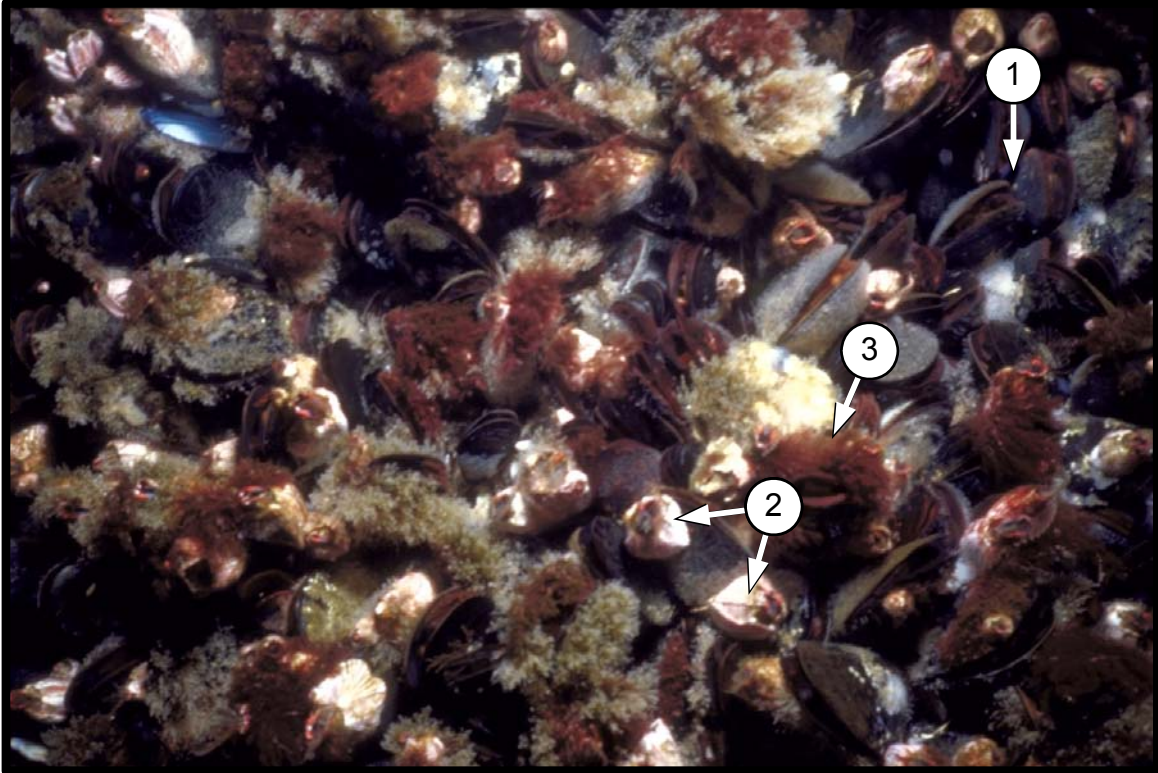


Photo 5. View of (1) *Mytilus* spp., (2) *Balanus* spp., and (3) filamentous red algae at -2 m (-8 ft), Leg C1, Platform Grace.

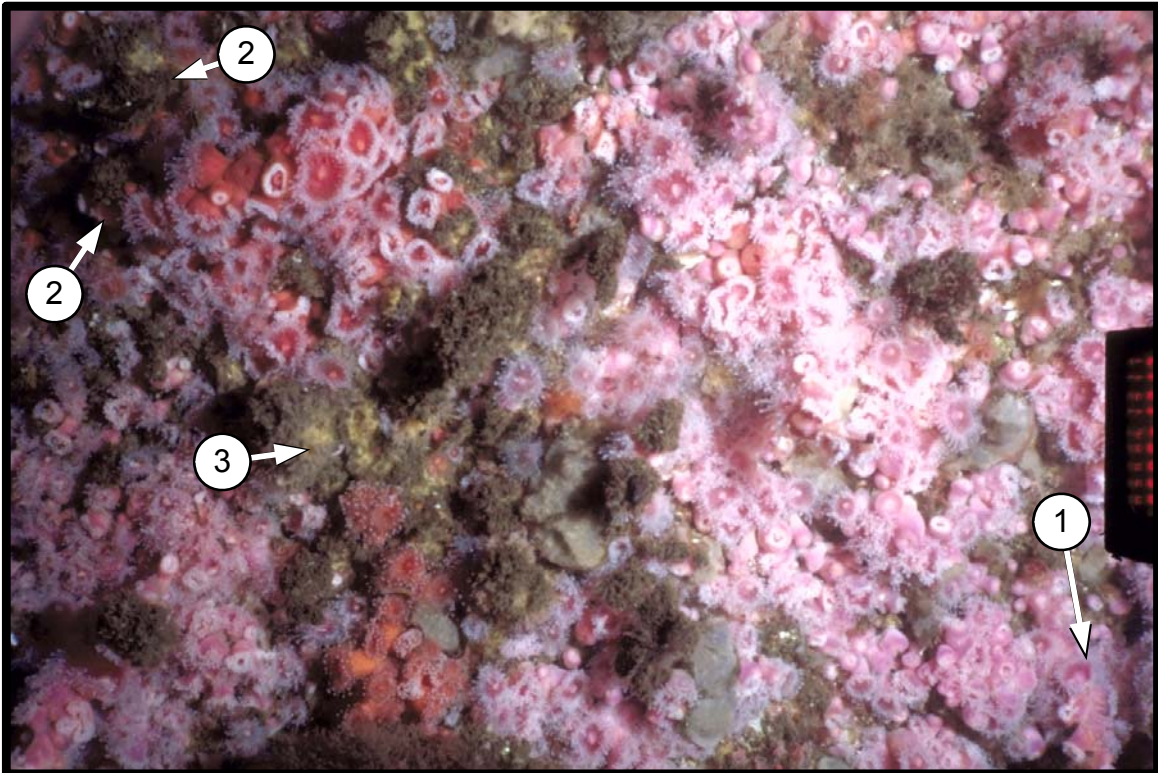


Photo 6. View of (1) *Corynactis californica*, (2) filamentous red algae, and (3) encrusting sponges at -19 m (-61 ft), Leg C1, Platform Grace.

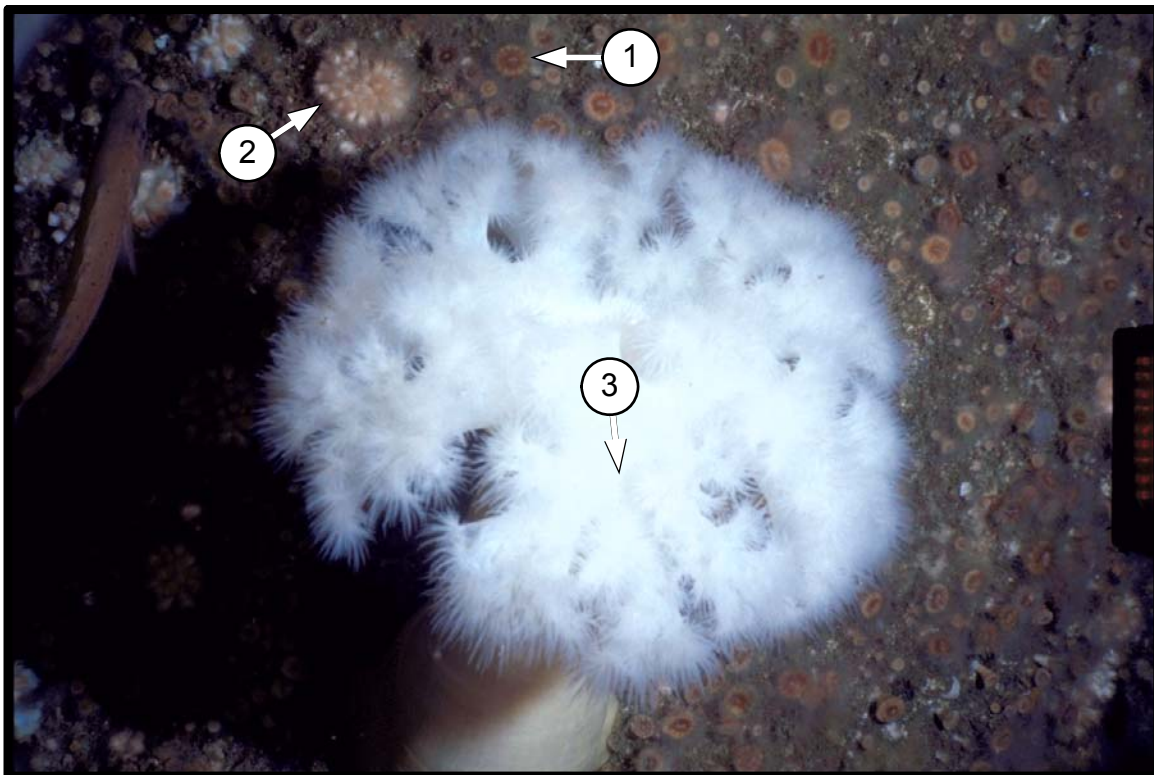


Photo 7. View of (1) *Paracyathus stearnsii*, (2) *Coenocyathus bowersi*, and (3) *Metridium farcimen* at -53 m (-174 ft), Leg C1, Platform Grace.

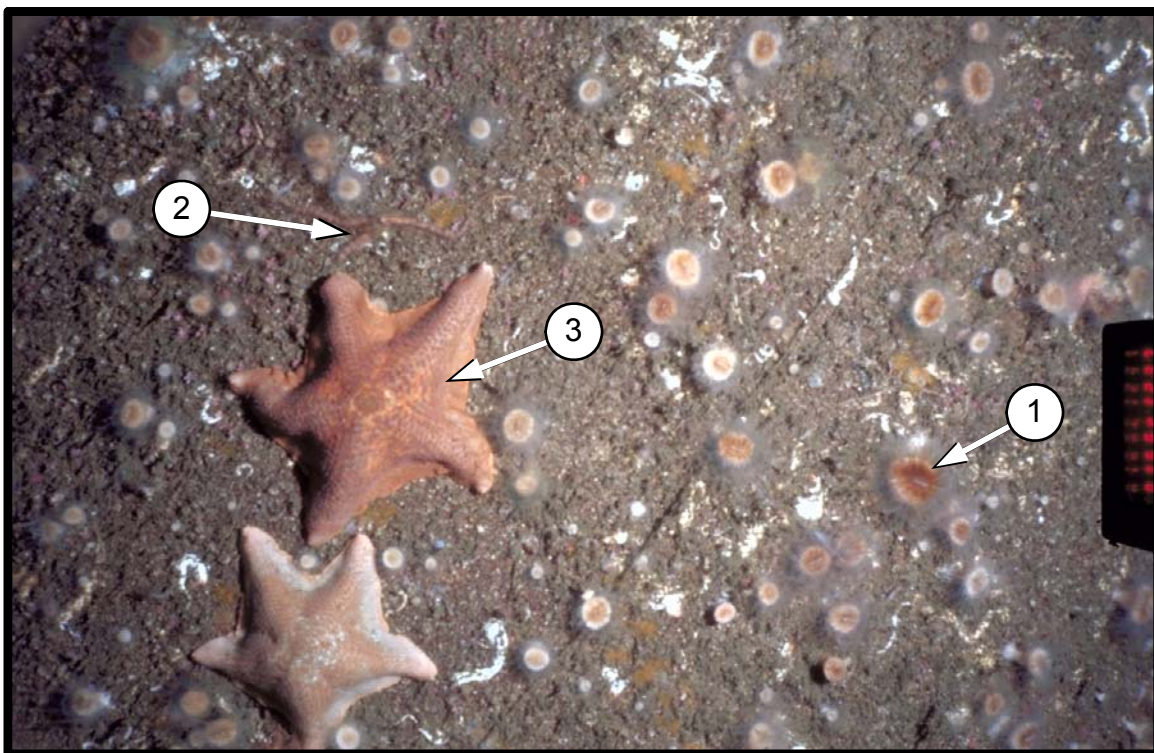


Photo 8. View of (1) *Paracyathus stearnsii*, (2) *Ophiothrix spiculata*, (3) *Asterina miniata*, and turf at -74 m (-242 ft), Leg C1, Platform Grace.

A graphic presentation of relative density (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present on Legs B1 and B2 is provided in **Figures 3-6** and **3-7**. Platform Grace exhibited well-defined *Mytilus* and *Corynactis* zones, abundant ophiuroids, a prominent barnacle community, and a broadly distributed anthozoan community (*Metridium*, *Corynactis*, *Anthopleura*). Many of the dominant species were also present on most other platforms (e.g., filamentous red algae, *Balanus* spp.). In terms of unique characteristics, Platform Grace exhibited the following trends: (1) prominent *Mytilus* and *Corynactis* communities, with no apparent overlap between the two species; and (2) a prominent *Paracyathus* community beginning in the lower portions of the *Corynactis* community and extending to the base of the platform.

3.3.3 Platform Harvest

Physical Characteristics

Platform Harvest, operated by Arguello, Inc., is located on Lease OCS-P 0315 (Arguello Field), approximately 10.8 km (5.8 nmi) from shore in the southern Santa Maria Basin. This 10-legged platform was installed on 12 June 1985 in a water depth of 206 m (675 ft).

Community Description

Legs B1 and B2 were sampled at Platform Harvest from the intertidal zone to the base of each platform leg. Based on complete analysis of 178 photographs from both legs, 53 taxa were identified, of which 34 percent (18) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with several specimens enumerated at higher taxonomic levels. Only three floral taxa (i.e., foliose red algae; *Egregia*; filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*) were among the 53 total taxa observed.

On Leg B1, the six most dominant taxa (based on total density, in descending order) included *Metridium senile*, an unidentified ophiuroid, *Mytilus* spp., *Corynactis californica*, *Leucetta*, and *Balanus* spp. (**Table 3-7**). Based on scraping analysis results (see **Section 3.7**), *Ophiothrix spiculata* and *Ophiopterus papillosa* were the only two ophiuroid species identified from Platform Harvest. Unidentified ophiuroids documented (via photographic analysis) at Platform Harvest were considered to be *Ophiothrix spiculata*, among the dominant taxa at all platforms.

Metridium senile had the highest frequency of occurrence on Leg B1 (82 out of 92 photographs), while *Corynactis californica* exhibited highest average density per occurrence at 168 individuals/0.0625 m². In terms of percent cover, prevalent species on Leg B1 included (in descending order) *Corynactis californica*, *Metridium senile*, *Metridium farcimen*, a red encruster, a lavender encruster, and turf. *Mytilus* spp. and foliose red algae were also prevalent. Bare metal was a prominent physical characteristic on this leg at depths below 38 m (125 ft).

Based on videotape review, algal depth on Leg B1 extended from the upper portions of the intertidal zone to a maximum depth of approximately 17 m (55 ft). Results of whole slide analysis, however, indicated algal presence (dominated by foliose red algae) extending to a depth of nearly 20 m (65 ft).

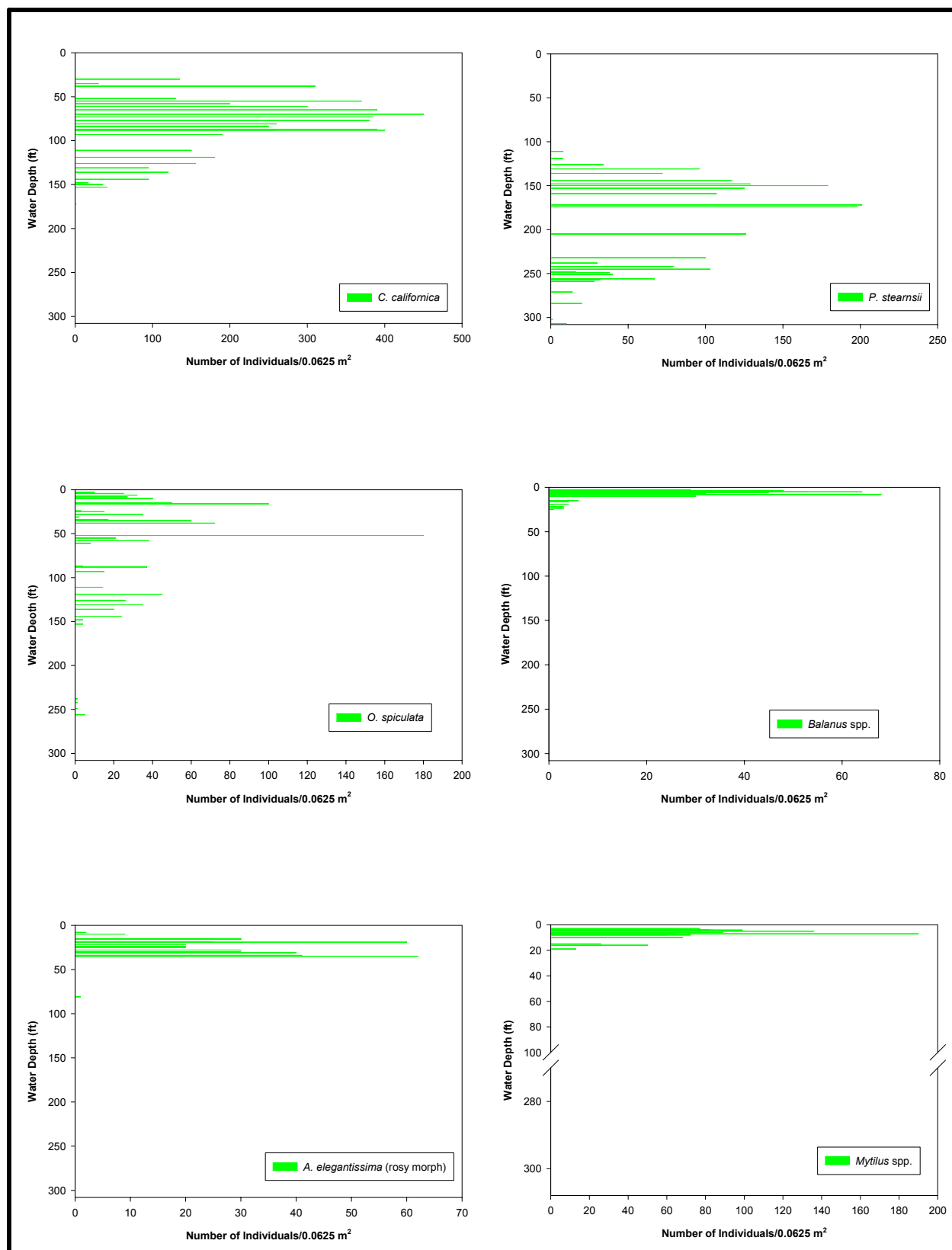


Figure 3-6. Density and depth distribution of the six numerically dominant taxa on Leg C1 of Platform Grace determined from quantitative slide analysis.

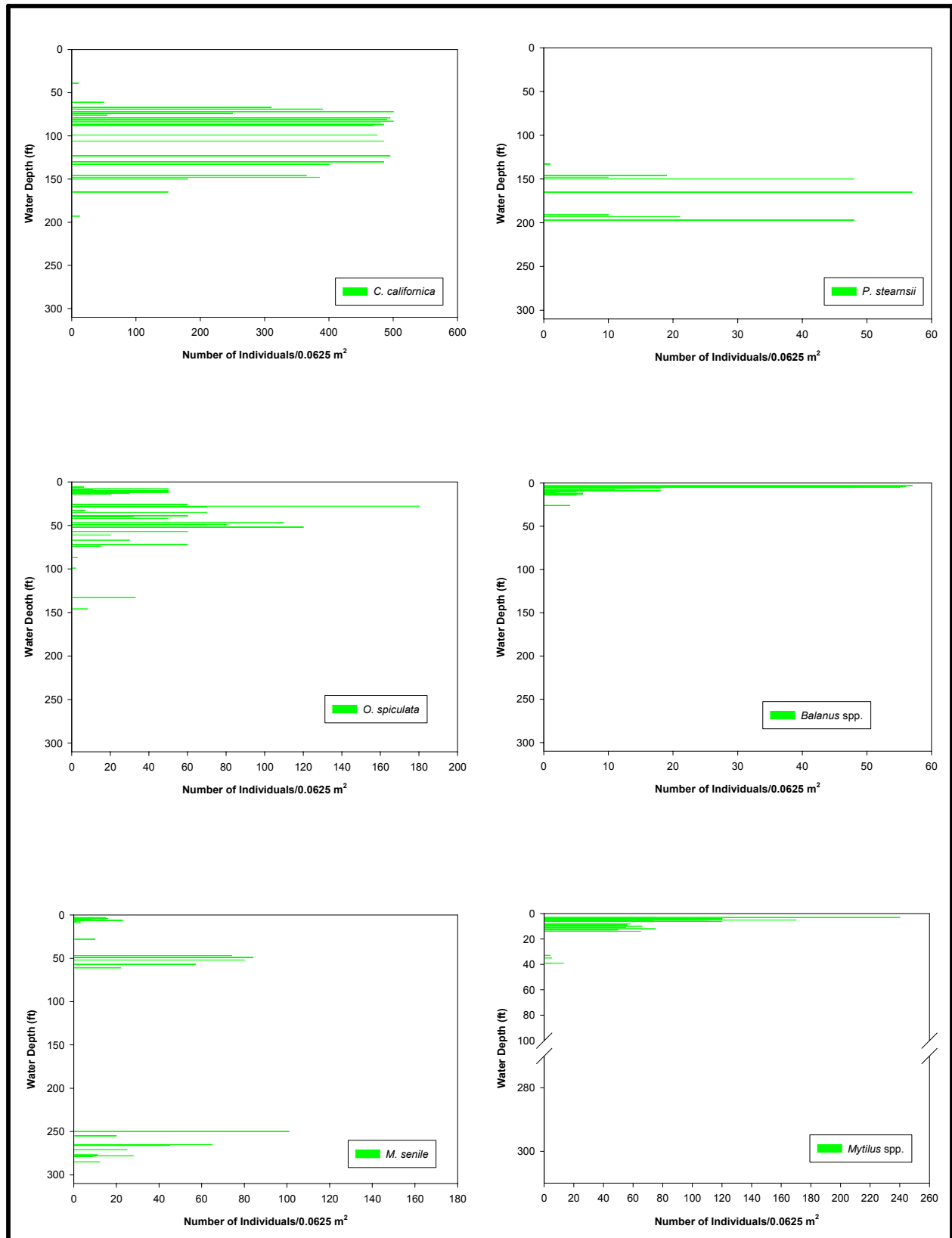


Figure 3-7. Density and depth distribution of the six numerically dominant taxa on Leg C4 of Platform Grace determined from quantitative slide analysis.

Table 3-7. Dominant taxa (or physical characteristics) on Leg B1 of Platform Harvest identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Metridium senile</i>	3,168	38.6	89.1	1-90	3-6; 10; 16; 22; 28; 33-98; 103-650; 664-669
Ophiuroid, unidentified	782	23.0	37.0	1-120	29-31; 37-41; 48-135; 225-335; 370; 455; 625
<i>Mytilus</i> spp.	734	36.7	21.7	1-75	3-29; 33-35; 46
<i>Corynactis californica</i>	672	168.0	4.3	12-360	102-103; 120; 126
<i>Leucetta losangelensis</i>	354	13.1	29.3	2-40	4; 12; 31-41; 48-51; 65-144; 158; 225; 292
<i>Balanus</i> spp.	188	5.9	34.8	1-18	3-22; 26-33; 46; 124; 135-157; 176-185; 209-225; 314
<i>Anthopleura elegantissima</i> (rosy morph)	124	7.8	17.4	1-24	3-26; 65
Worm tubes, calcareous	105	3.5	32.6	1-11	144; 154; 176-199; 225-243; 278-288; 314-402; 418-455; 504-519; 585-597; 614-618
Turf	72	1.0	78.3	1 (max)	3-41; 48-51; 65-68; 135-209; 243; 288-301; 329-519; 569-647; 664-669
Tunicate, encrusting translucent	50	7.1	7.6	1-15	314; 366-370; 395; 519; 581; 625
Bare Metal	48	1.0	52.2	1 (max)	125; 137; 149-157; 176-225; 260-292; 314-650; 664-669
Encruster, red	48	1.0	52.2	1 (max)	135-144; 176-292; 314-650; 664-669
Percent Cover:					
<i>Corynactis californica</i>		42.0	4.3	3-90	102-103; 120; 126
<i>Metridium senile</i>		38.5	89.1	1-90	3-6; 10; 16; 22; 28; 33-98; 103-650; 664-669
<i>Metridium farcimen</i>		37.0	5.4	15-100	29-31; 659-669
Encruster, red		35.4	52.2	2-75	135-144; 176-292; 314-647; 664-669
Encruster, lavender		27.7	3.3	3-65	278; 301; 533
Turf		21.3	78.3	1-75	3-41; 48-51; 65-68; 135-209; 243; 288-301; 329-519; 569-647; 664-669
<i>Mytilus</i> spp.		21.0	21.7	5-50	3-29; 33-35; 46
<i>Botrylloides</i> spp.		20.0	1.1	20	65
<i>Leucetta losangelensis</i>		14.8	29.3	1-30	4; 12; 31-41; 48-51; 65-144; 158; 225; 292
Encruster - yellow		13.1	14.1	0.5-65	144-154; 209; 260-278; 292-335; 372-395
Foliose red algae		12.2	23.9	1-30	4-6; 10; 14-46; 58-65
Bare Metal		11.5	52.2	1-50	125; 137; 149-157; 176-225; 260-292; 314-650; 664-669

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Ninety-two (92) photographs were analyzed from Leg B1.

Taxonomic notes: Foliose red algae possibly include *Callophyllis*.

On Leg B2, similar dominant species were evident as compared to Leg B1, with slight reordering among the top five taxa – *Metridium senile*, an unidentified ophiuroid (considered to be *O. spiculata*), *Leucetta*, *Mytilus* spp., *Corynactis californica*, and *Balanus* spp. *Leucetta* exhibited the highest total density on this leg, followed closely by ophiuroids, *Mytilus*, *Corynactis*, and *Metridium senile*. On Leg B2, *Metridium senile* was the most frequently encountered species, occurring in 87 percent of the photographs. While *M. senile* was present at nearly all depths on this leg (**Table 3-8**), its mean density was lower than that evident on Leg B1 (i.e., 30 versus 39 individuals/0.0625 m²). Maximum density for this species was 90 individuals, or 1,440 individuals/m².

Review of inspection videotapes suggested that algal depth on Leg B2 extended from the upper portions of the intertidal zone to a maximum depth of approximately 17 m (55 ft). Results of whole slide analysis indicated algal presence (dominated by foliose red algae) extending to this depth. Filamentous red algae were very limited on Leg B2, present only in the intertidal zone at depths of 0.6 to 1.2 and 1.8 to 2.1 m (2 to 4 and 6 to 7 ft).

A relatively well-defined *Mytilus* zone was noted on Platform Harvest, with frequent occurrence between the intertidal and 11 m (3 to 35 ft), although depth of occurrence on Leg B2 was limited to the upper 8 m (25 ft) (**Tables 3-7 and 3-8; Photo 9**). Maximum abundance of *Mytilus* was 110 individuals/0.0625 m², or 1,760 individuals/m², found at a depth of 0.6 m (2 ft) on Leg B2. *Balanus*, *Anthopleura*, and red algae were also noticeable dominants within the *Mytilus* zone at Platform Harvest.

Dominant taxa on both legs of Platform Harvest, based on percent cover estimators, included a red encruster, *Metridium senile*, turf, and *Mytilus* spp, among other taxa. (**Tables 3-7 and 3-8**). The high occurrence and significant percent cover contribution of *M. senile* and *Mytilus* were expected given their numerical dominance noted previously. The presence of “turf” is also noteworthy; turf was present in ~80 percent of the photographs at Platform Harvest and its contribution to total percent cover was generally high, averaging 19 to 21 percent. A prominent sponge (*Leucetta*) was also a numerical and percent cover dominant on both legs of Platform Harvest.

Maximum mussel abundance was only 110 individuals/0.0625 m², or 1,760 individuals per m². Turf, barnacles, and red algae were also dominant within the mussel zone and regularly co-occurred with mussels, while *Metridium senile* occurred intermittently within the mussel zone (**Photo 9**). The rosy morph form of *Anthopleura elegantissima* was also prominent in the upper 8 m (25 ft) of both legs. Depending on where along the platform it occurs, *Metridium senile* can also be found in association with ophiuroids, barnacles, and/or turf (**Photos 10, 11, and 12**).

A graphic presentation of relative density (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present on Legs B1 and B2 is provided in **Figures 3-8 and 3-9**. Platform Harvest exhibited a well-defined *Mytilus* zone, abundant ophiuroids, a prominent sponge (*Leucetta*), and a broadly distributed anthozoan community (*Metridium*, *Corynactis*, *Anthopleura*). Many of the dominant species were also present on most other platforms (e.g., filamentous red algae, *Balanus* spp.).

Table 3-8. Dominant taxa (or physical characteristics) on Leg B2 of Platform Harvest identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Metridium senile</i>	2,216	29.5	87.2	2-90	4-6; 10-612
Ophiuroid, unidentified	1,566	44.7	40.7	1-180	4; 12; 27-47; 54-69; 88-129; 229-320; 330-359; 376-390
<i>Leucetta losangelensis</i>	1,473	50.8	33.7	6-80	4; 10-150
<i>Mytilus</i> spp.	858	42.8	23.3	1-110	2-12; 18-25
<i>Corynactis californica</i>	179	35.8	5.8	4-80	14; 30; 52; 95; 101
<i>Balanus</i> spp.	169	4.2	46.6	1-27	3-8; 12-18; 25; 30-69; 88; 95-145; 155; 196-199; 266-271; 392
<i>Anthopleura elegantissima</i> (rosy morph)	160	9.4	19.8	2-20	2-10; 24
Filamentous red algae	107	21.4	5.8	2-40	2-4; 6-7
Turf	71	1.0	82.6	1 (max)	2-25; 30-52; 64; 88; 122; 129-196; 241-303; 325-359; 376-612
Worm tubes, calcareous	68	2.8	27.9	1-12	150-153; 229-241; 292-330; 368-477; 573; 612
Encruster, red	43	1.0	50.0	1 (max)	145-155; 199-612
<i>Pollicipes polymerus</i>	36	9.0	4.7	5-20	2; 4; 6
Percent Cover:					
Encruster, red		49.6	50.0	3-90	145-155; 199-612
<i>Leucetta losangelensis</i>		48.8	33.7	5-80	4; 10-150
<i>Mytilus</i> spp.		35.0	23.3	5-90	2-12; 18-25
Sponge, tan encrusting		30.0	2.3	30	241-244
<i>Metridium senile</i>		29.5	87.2	2-90	4-6; 10-612
Encruster - tan		26.3	4.7	5-50	7; 196-229
Turf		19.3	82.6	0.5-70	2-25; 30-52; 64; 88; 122; 129-196; 241-303; 325-359; 376-612
Sponge, yellow encrusting		16.1	9.3	2-80	3-6; 8; 158; 271; 413
Encruster - yellow		16.0	8.1	1-70	7; 150; 155; 266; 320-325; 368
<i>Corynactis californica</i>		11.0	5.8	1-20	14; 52; 30; 95; 101
<i>Anthopleura elegantissima</i> (rosy morph)		8.9	19.8	2-20	2-10; 24
Bare Metal		7.8	39.5	0.5-25	127; 153-155; 196-241; 259; 294-320; 359-413; 444-504; 558-612

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Eighty-six (86) photographs were analyzed from Leg B2.

Taxonomic notes: Filamentous red algae may include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.

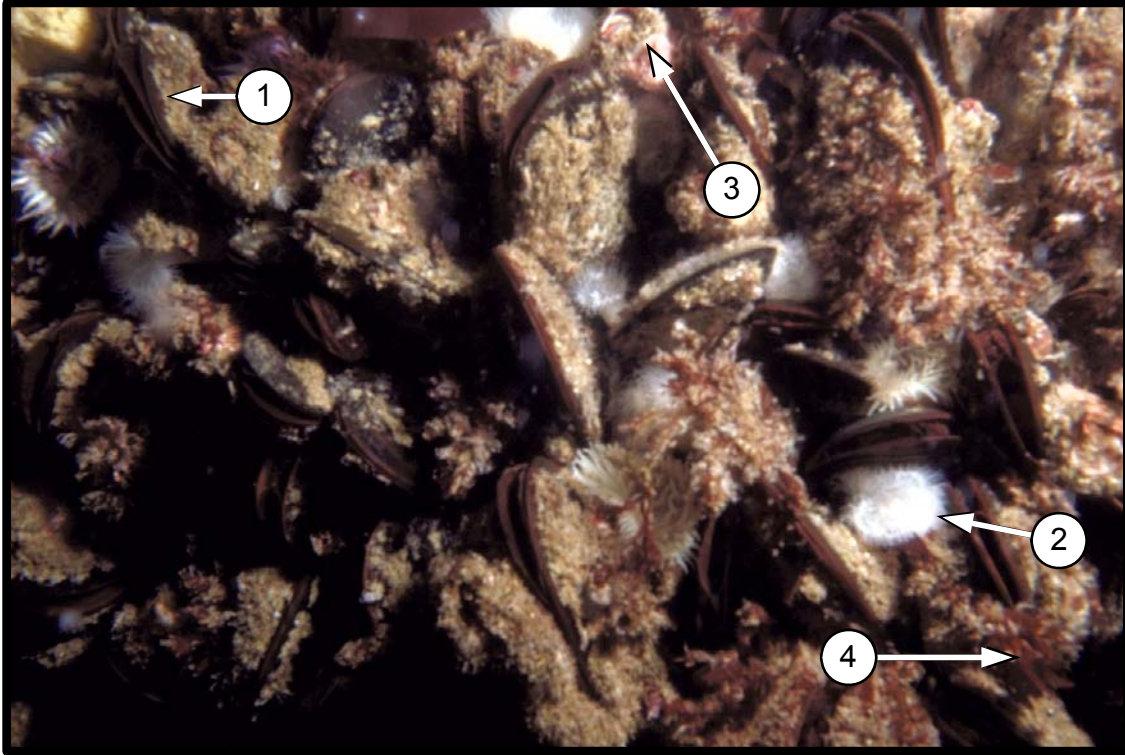


Photo 9. View of (1) *Mytilus* spp., (2) *Metridium senile*, (3) *Balanus* spp., and (4) filamentous red algae at -2 m (-6 ft), Leg B1, Platform Harvest.

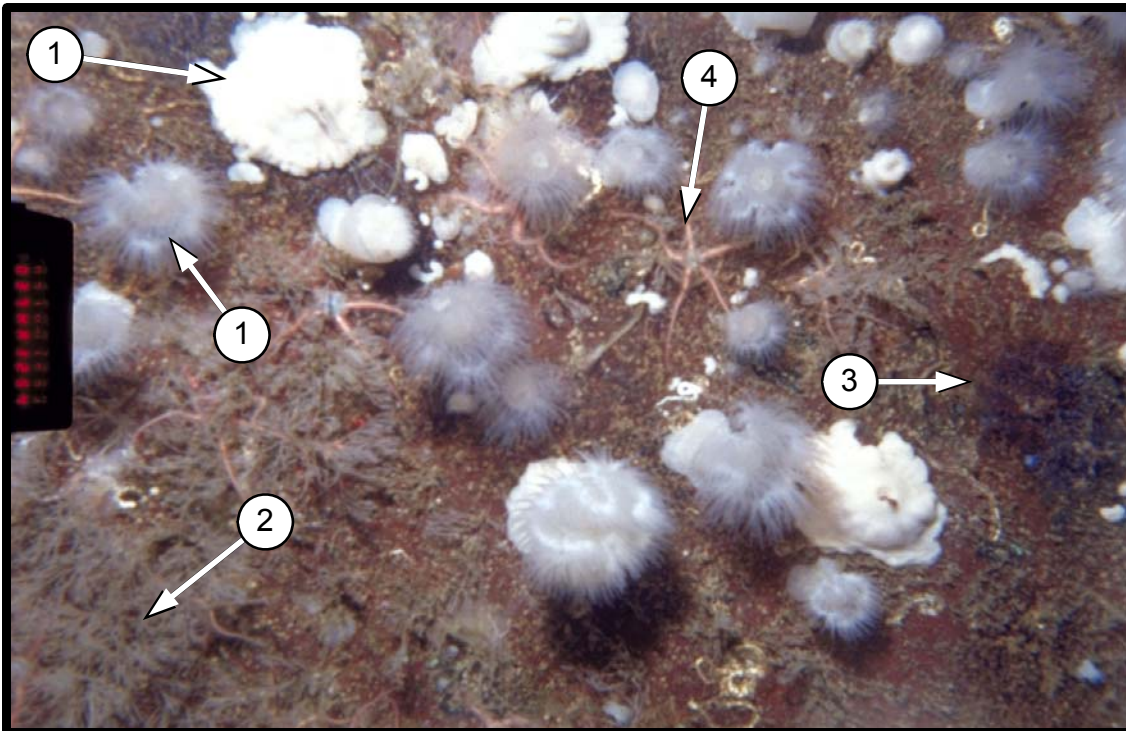


Photo 10. View of (1) *Metridium senile*, (2) tan branching bryozoan colonies, (3) red encrusters, and (4) unidentified ophiuroids at -90 m (-294 ft), Leg B2, Platform Harvest.



Photo 11. View of (1) *Balanus nubilus*, (2) *Metridium senile*, and (3) turf at -47 m (-153 ft), Leg B2, Platform Harvest.

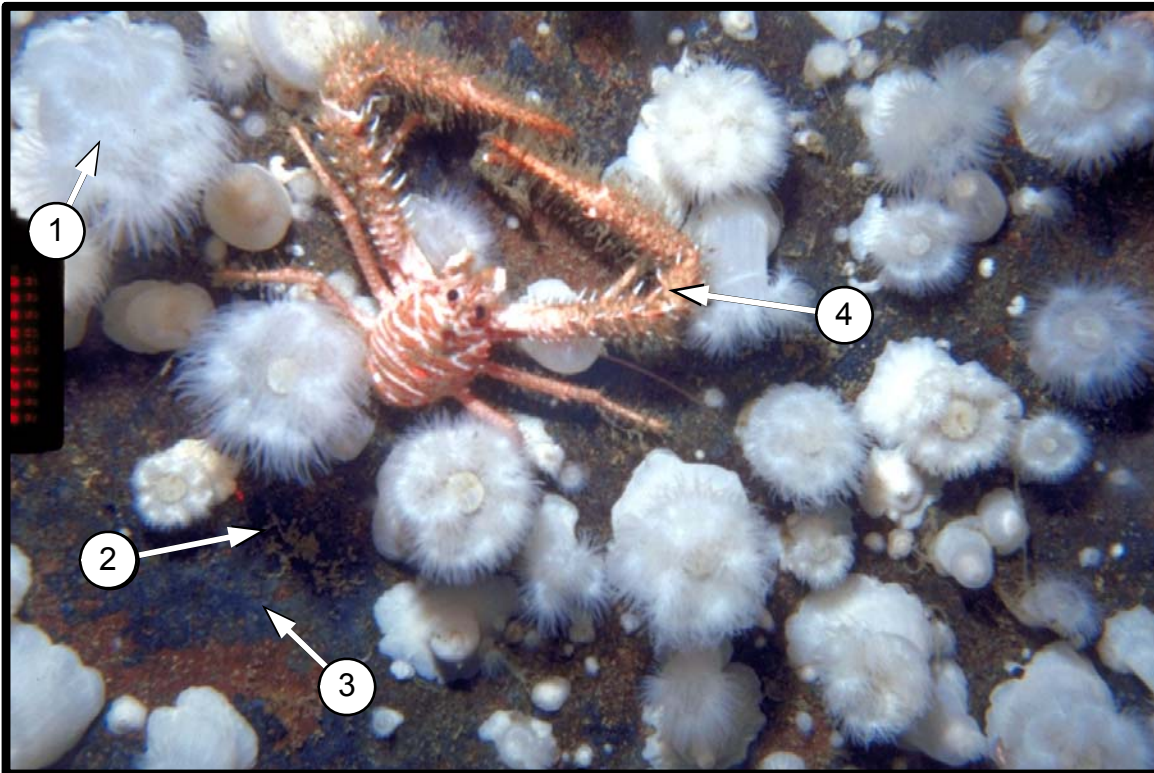


Photo 12. View of (1) *Metridium senile*, (2) turf, (3) bare metal, and (4) *Galathea californiensis* at -177 m (-580 ft), Leg B2, Platform Harvest.

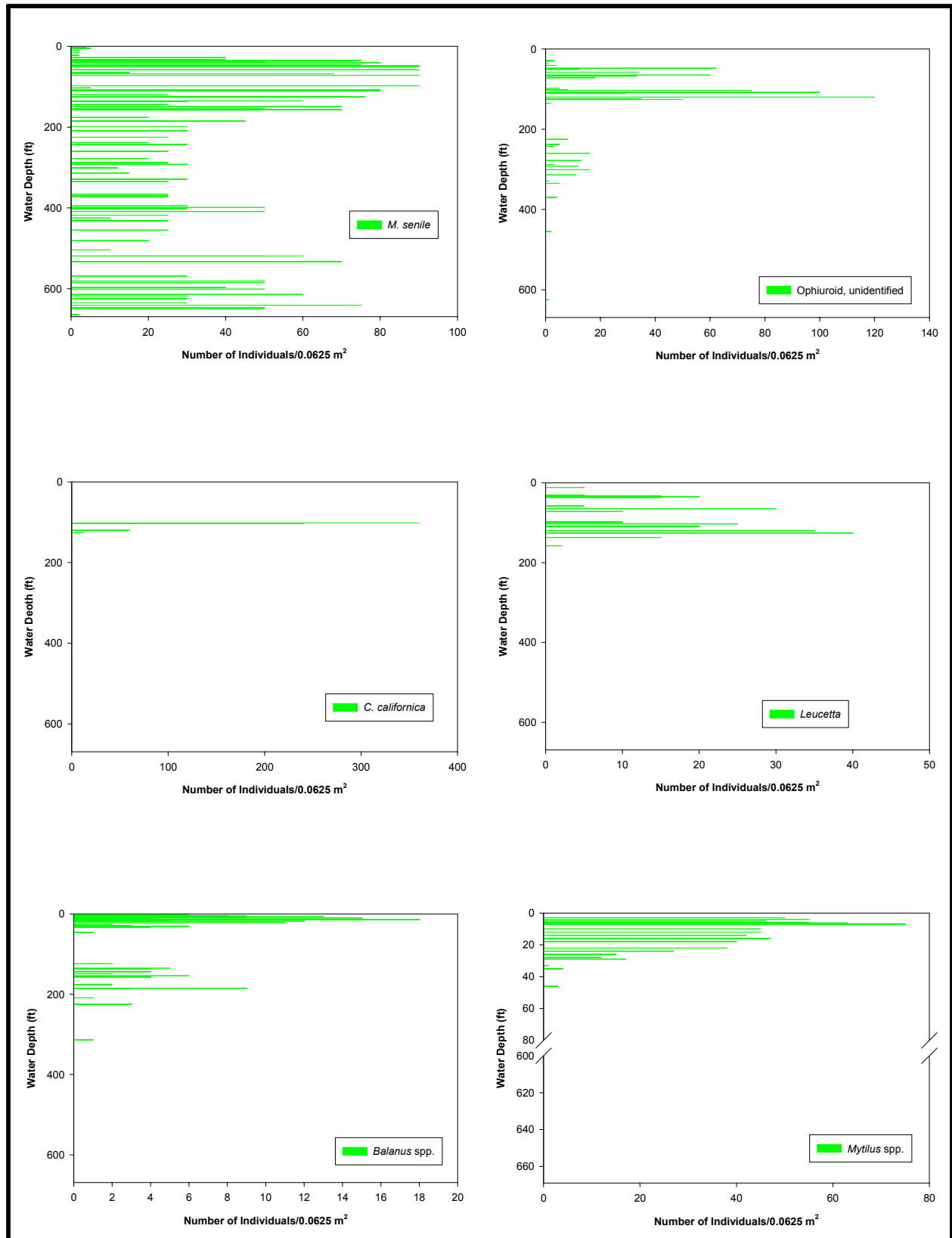


Figure 3-8. Density and depth distribution of the six numerically dominant taxa on Leg B1 of Platform Harvest determined from quantitative slide analysis.

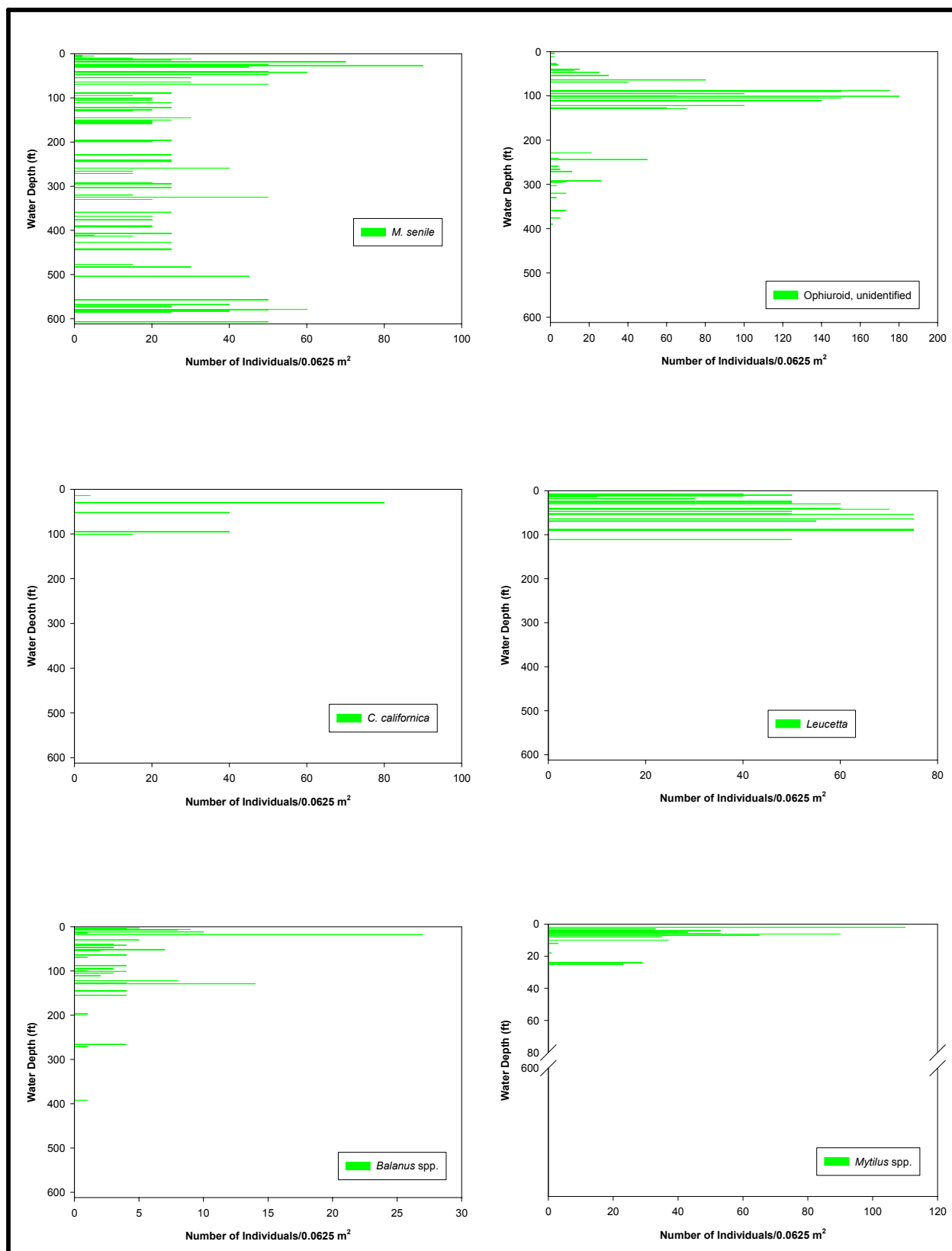


Figure 3-9. Density and depth distribution of the six numerically dominant taxa on Leg B2 of Platform Harvest determined from quantitative slide analysis.

In terms of unique characteristics, Platform Harvest exhibited the following trends: (1) a broad barnacle zone (*Balanus* spp.) that extended along nearly two-thirds of the platform legs and exhibited a slight bimodal distribution (at 3.7 to 5.5 m [12 to 18 ft] and at approximately 36.6 m [120 ft]); (2) foliose red algae occurring from the intertidal to 19.8 m (65 ft), primarily within the mussel bed, with limited presence and depth distribution of filamentous algae; and (3) red encrusters, representing a significant contributor to percent cover, found between 41.1 and 203.9 m (135 ft and 669 ft), with maximum densities encountered at approximately 121.9 m (400 ft).

3.3.4 Platform Hidalgo

Physical Characteristics

Platform Hidalgo, operated by Arguello, Inc., is located on Lease OCS-P 0450 (Arguello Field), approximately 9.5 km (5.1 nmi) from shore in the southern Santa Maria Basin. This 8-legged platform was installed on 2 July 1986 in a water depth of 131 m (430 ft).

Community Description

Legs A1 and B1 were sampled at Platform Hidalgo. Based on analysis of 141 photographs, a total of 54 taxa was identified, of which 39 percent (21) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with several specimens enumerated at higher taxonomic levels. Only four floral taxa (i.e., foliose red algae; *Egregia*; filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Rhodomenia*) were among the 53 total taxa observed.

On Leg A1, the six most dominant taxa (based on total density, in descending order) included *Metridium senile*, an unidentified ophiuroid, *Mytilus* spp., *Corynactis californica*, *Balanus nubilus*, and *Metridium farcimen* (**Table 3-9**). *M. senile* had the highest frequency of occurrence (58 out of 63 photographs), was nearly continuous in its distribution (from the intertidal to the base of the leg), and exhibited the highest average density (135 individuals/0.0625 m²). Among the other density-dominant taxa, ophiuroids were also prevalent along the entire length of Leg A1, while barnacles (*Balanus nubilus*) occurred within the upper 30 m (100 ft) of the leg. *Corynactis californica* was not well established on this leg, occurring intermittently between 24 and 31 m (78 to 101 ft). In terms of percent cover, prevalent species on Leg A1 included (in descending order) *Mytilus* spp., *Metridium senile*, a yellow encruster, *Leucetta losangelensis*, *Metridium farcimen*, and a tan foliose sponge. Bare metal was evident at 44 m (145 ft), and was a prevalent feature on this leg at depths below 87 m (285 ft). Turf was also prominent on this leg.

Based on videotape review, algal depth on Leg A1 extended from the upper portions of the intertidal zone to a maximum depth of approximately 18 m (60 ft). Results of whole slide analysis indicated algal presence (dominated by foliose red algae) extending to a depth of 16 m (52 ft).

Table 3-9. Dominant taxa (or physical characteristics) on Leg A1 of Platform Hidalgo identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Metridium senile</i>	7,849	135.3	92.1	1-275	5-424
Ophiuroid, unidentified	3,842	78.4	77.8	1-430	5-318; 355; 409; 430
<i>Mytilus</i> spp.	1,190	85.0	22.2	5-194	3-29
<i>Corynactis californica</i>	139	27.8	7.9	9-75	78-82; 86; 91; 101
<i>Balanus nubilus</i>	92	3.4	42.9	1-13	5-15; 29-58; 72-88; 93-96; 100-101
<i>Metridium farcimen</i>	73	24.3	4.8	19-34	427-430
Worm tubes, calcareous	47	2.9	25.4	1-8	256-285; 318-355; 392-430
Turf	34	1.0	54.0	1 (max)	3-8; 15-41; 145; 189; 243-355; 392-430
<i>Eudistylia polymorpha</i>	32	5.3	9.5	2-13	3-7
<i>Leucetta losangelensis</i>	30	1.0	47.6	1 (max)	3-7; 29-145; 171-222
<i>Tetraclita squamosa</i>	23	23.0	1.6	23 (max)	6
Bare Metal	17	1.0	27.0	1 (max)	145; 243; 285-355; 392-418; 424-430
Percent Cover:					
<i>Mytilus</i> spp.		57.1	22.2	5-85	3-29
<i>Metridium senile</i>		46.7	92.1	3-90	5-424
Encruster - yellow		30.0	3.2	10-50	189; 256
<i>Leucetta losangelensis</i>		25.3	47.6	5-60	3-7; 29-145; 171-222
<i>Metridium farcimen</i>		21.7	4.8	10-35	427-430
Sponge, tan foliose		20.0	1.6	20	418
Bare Metal		18.5	27.0	0.5-60	145; 243; 285-355; 392-418; 424-430
Turf		18.2	54.0	2-40	3-8; 15-41; 145; 189; 243-355; 392-430
Encruster - tan		17.3	23.8	1-60	85; 118-171; 243-285; 318-386; 420-424
Encruster, lavender		15.0	4.8	5-25	392; 401; 415
<i>Corynactis californica</i>		9.0	7.9	2-25	78-82; 86; 91; 101
Sponge, tan encrusting		7.8	4.8	0.5-20	60; 222; 392

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Sixty-three (63) photographs were analyzed from Leg A1.

Taxonomic notes: Bryozoa, tan branching is a colonial (c) species; foliose red algae possibly include *Gigartina* and *Cryptopleura*.

On Leg B1, similar dominant species were evident as compared to Leg A1 (based on total density, in descending order), with slight reordering among the top six taxa – *Metridium senile*, *Mytilus* spp., an unidentified ophiuroid, the rosy morph form of *Anthopleura elegantissima*, *Balanus* spp., and *Metridium farcimen* (**Table 3-10**). Of particular note on this leg, the rosy morph form of *Anthopleura elegantissima* replaced *Corynactis californica*, the latter of which was not evident in any of the photographs from Leg B1. *Metridium senile* exhibited the highest total density and was a major contributor to percent cover, occurring in 82 percent of the photographs and prevalent in depths between 0 and 122 m (0 and 399 ft) on Leg B2 (**Photo 13**). When present in the 0 to 6 m (0 to 21 ft) depth range, *Mytilus* spp. exhibited the highest densities and percent cover contributions of the dominant taxa, often co-occurring with a variety of other taxa (**Photo 14**).

Review of inspection videotapes suggested that algal depth on Leg B2 extended from the upper portions of the intertidal zone to a maximum depth of approximately 18 m (60 ft). Results of whole slide analysis indicated algal presence (dominated by foliose red algae) extending to a maximum depth of 25 m (81 ft).

A well-defined *Mytilus* zone was noted on Platform Hidalgo, with frequent occurrence between the intertidal and 6 to 9 m (21 and 29 ft), depending upon the platform leg (**Tables 3-9 and 3-10**). Maximum abundance of *Mytilus* was 220 individuals/0.0625 m², or 3,520 individuals/m², found at a depth of 2 m (8 ft) on Leg B1. *Metridium senile*, ophiuroids, barnacles, and sponges were also noticeable dominants within the *Mytilus* zone at Platform Hidalgo.

Dominant taxa on both legs of Platform Hidalgo, based on percent cover estimators, included *Mytilus* spp., *Metridium senile*, *Leucetta losangelensis*, and turf (**Photo 15; Tables 3-9 and 3-10**). The frequent occurrence and significant percent cover contribution of *M. senile*, *Mytilus* spp., and *Leucetta losangelensis* in the upper portions of the platform were expected given their numerical dominance noted previously.

Below the *Mytilus* zone, *Metridium senile* remained a predominant species, co-occurring with a variety of other species including various encrusters, calcareous worm tubes, and turf, all of which were noted numerical and/or percent cover dominants (**Photo 16**). The presence of “turf” is noteworthy; turf was present in 50 to 60 percent of the photographs at Platform Hidalgo; its contribution to total percent cover was variable and generally high, averaging 18 to 30 percent.

A graphic presentation of relative density (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present on Legs A1 and B1 is provided in **Figures 3-10 and 3-11**. Platform Hidalgo exhibited a relatively narrow, but well-defined *Mytilus* zone. The relative distribution of mussels over depth was generally similar between Legs A1 and B1. Highest numbers were evident between 0.6 and 2.4 m (2 and 8 ft), tapering off with depth. This platform also exhibited a broadly distributed anthozoan community (*A. elegantissima* [rosy morph] and *Metridium senile*), and several abundant species that were also present on most other platforms (e.g., ophiuroids, barnacles). In terms of unique characteristics, Platform Habitat exhibited an unusual trend, specifically notable in the limited presence of *Corynactis californica* on Leg A1 and the prevalence of *Anthopleura elegantissima* on Leg B1.

Table 3-10. Dominant taxa (or physical characteristics) on Leg B1 of Platform Hidalgo identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Metridium senile</i>	5,048	78.9	82.1	1-245	0-399
<i>Mytilus</i> spp.	2,710	117.8	29.5	10-220	0-21
Ophiuroid, unidentified	2,659	59.1	57.7	1-260	3-5; 14-18; 27-50; 57; 73-151; 179-279; 315; 368; 391; 421
<i>Anthopleura elegantissima</i> (rosy morph)	849	84.9	12.8	2-185	3; 7; 18-45
<i>Balanus</i> spp.	56	4.7	15.4	1-9	0-6; 8; 14; 18; 62
<i>Metridium farcimen</i>	55	27.5	2.6	13-42	430-431
Turf	49	1.0	62.8	1 (max)	0-27; 40-45; 81; 215-433
Worm tubes, calcareous	49	2.6	24.4	1-5	215-299; 340; 381-430; 433
<i>Ophiothrix spiculata</i>	42	7.0	7.7	1-17	1; 6-7; 165; 215-232
<i>Tetracita squamosa</i>	38	5.4	9.0	2-9	3-7; 14-15
<i>Balanus nubilus</i>	32	2.5	16.7	1-7	27-29; 40; 48-57; 73; 78-81; 90-92
<i>Leucetta losangelensis</i>	32	1.0	41.0	1 (max)	7; 21; 29-151; 179-199
Percent Cover:					
<i>Mytilus</i> spp.		54.2	29.5	3-80	0-21
<i>Anthopleura elegantissima</i> (rosy morph)		43.5	12.8	1-95	3; 7; 18-45
Bare Metal		39.0	10.3	2-65	27; 421-433
<i>Metridium senile</i>		34.9	82.1	0.5-98	0-399
<i>Leucetta losangelensis</i>		30.5	41.0	2-80	7; 21; 29-151; 179-199
Turf		30.1	62.8	0.5-80	0-27; 40-45; 81; 215-433
Encruster, red		22.4	21.8	5-70	165; 215-419
<i>Metridium farcimen</i>		17.5	2.6	15-20	430-431
Encruster - blue		13.1	19.2	0.5-30	151; 215-279; 315-412
Encruster - yellow		12.1	12.8	0.5-50	199; 232; 279-368; 391-399
Encruster - tan		10.4	7.7	0.5-30	165; 215; 255; 299; 329; 368
Sponge, tan encrusting		10.0	1.3	10	54

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Seventy-eight (78) photographs were analyzed from Leg B1.

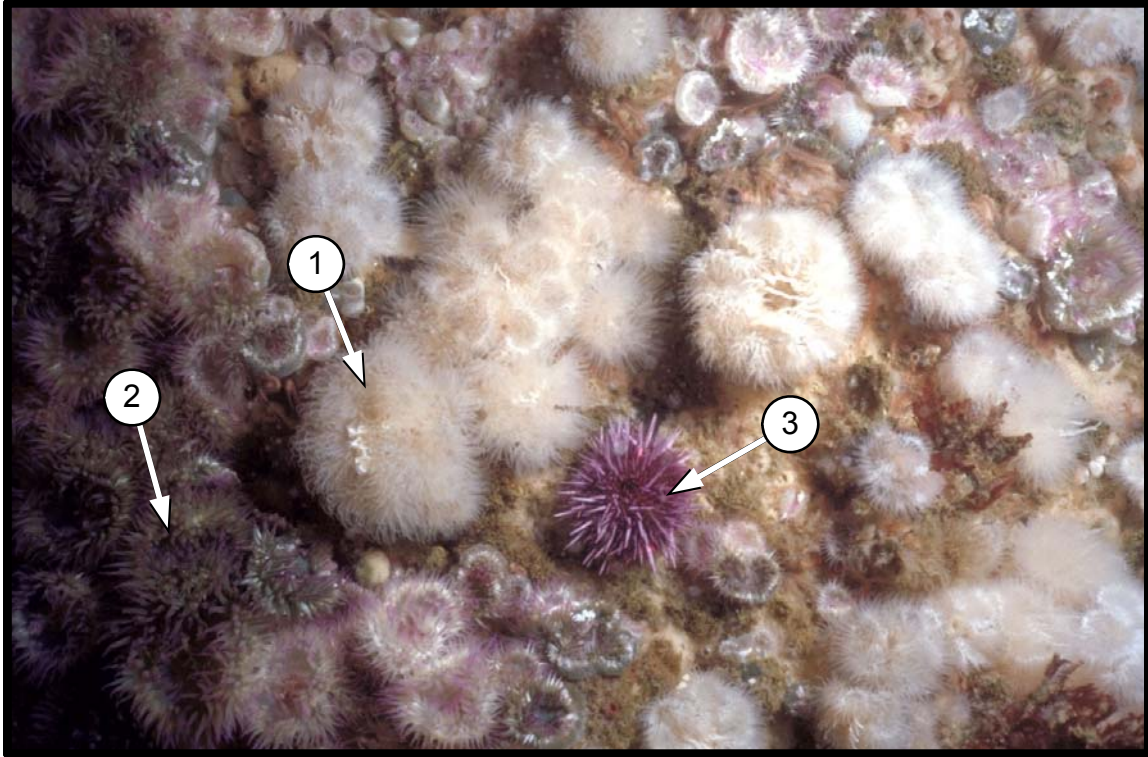


Photo 13. View of (1) *Metridium senile*, (2) *Anthopleura elegantissima* (rosy morph), and (3) *Strongylocentrotus purpuratus* at -14 m (-45 ft), Leg B1, Platform Hidalgo.



Photo 14. View of (1) *Mytilus* spp. and associated fauna at -2 m (-6 ft), Leg B1, Platform Hidalgo.

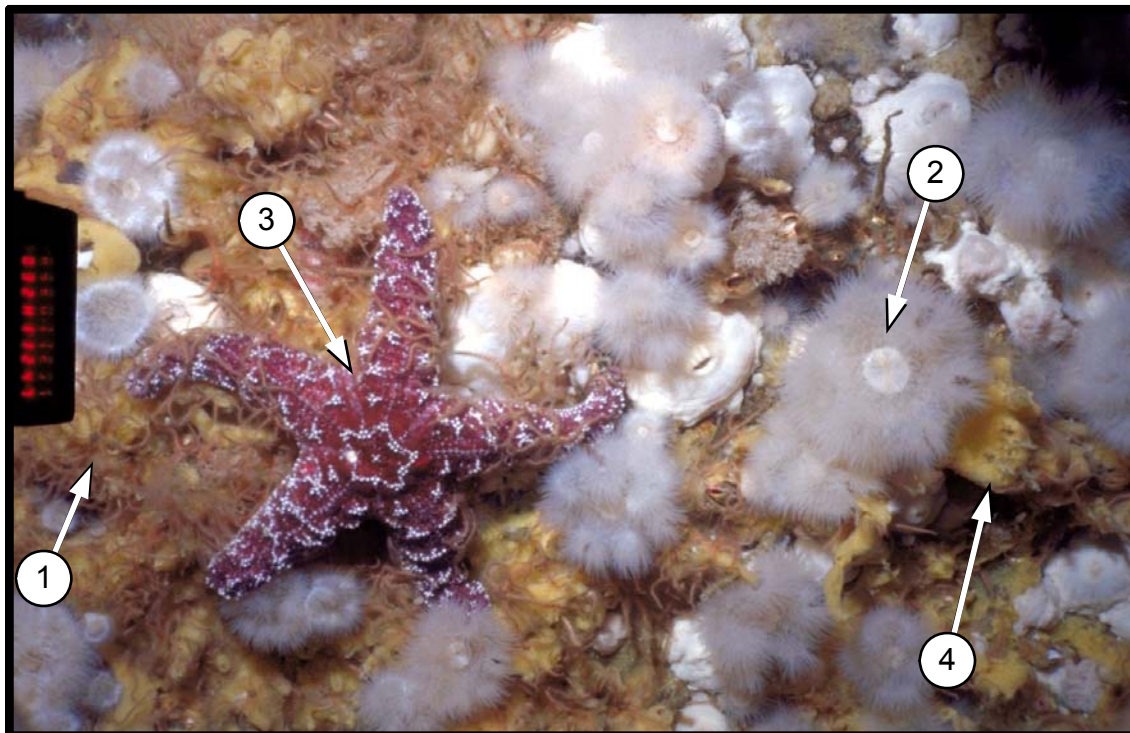


Photo 15. View of (1) unidentified ophiuroids, (2) *Metridium senile*, (3) *Pisaster ochraceus*, and (4) *Leucetta losangelensis* at -30 m (-99 ft), Leg A1, Platform Hidalgo.

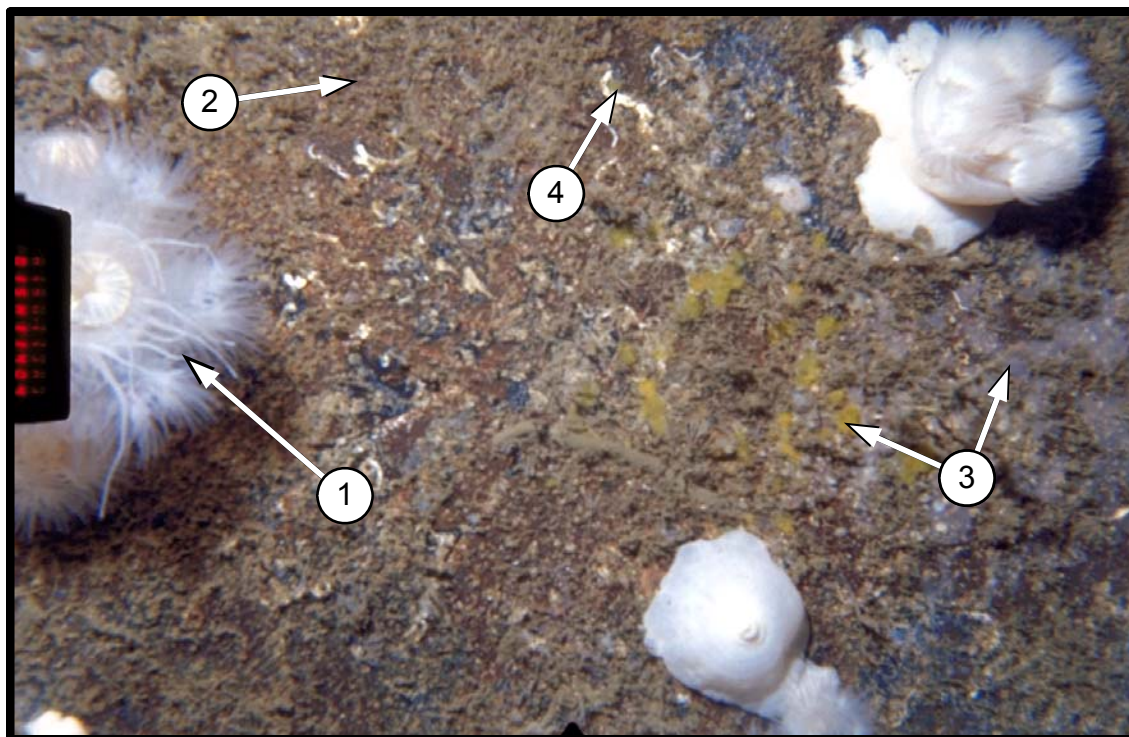


Photo 16. View of (1) *Metridium senile*, (2) turf, (3) various encrusters, and (4) calcareous worm tubes at -122 m (-399 ft), Leg B1, Platform Hidalgo.

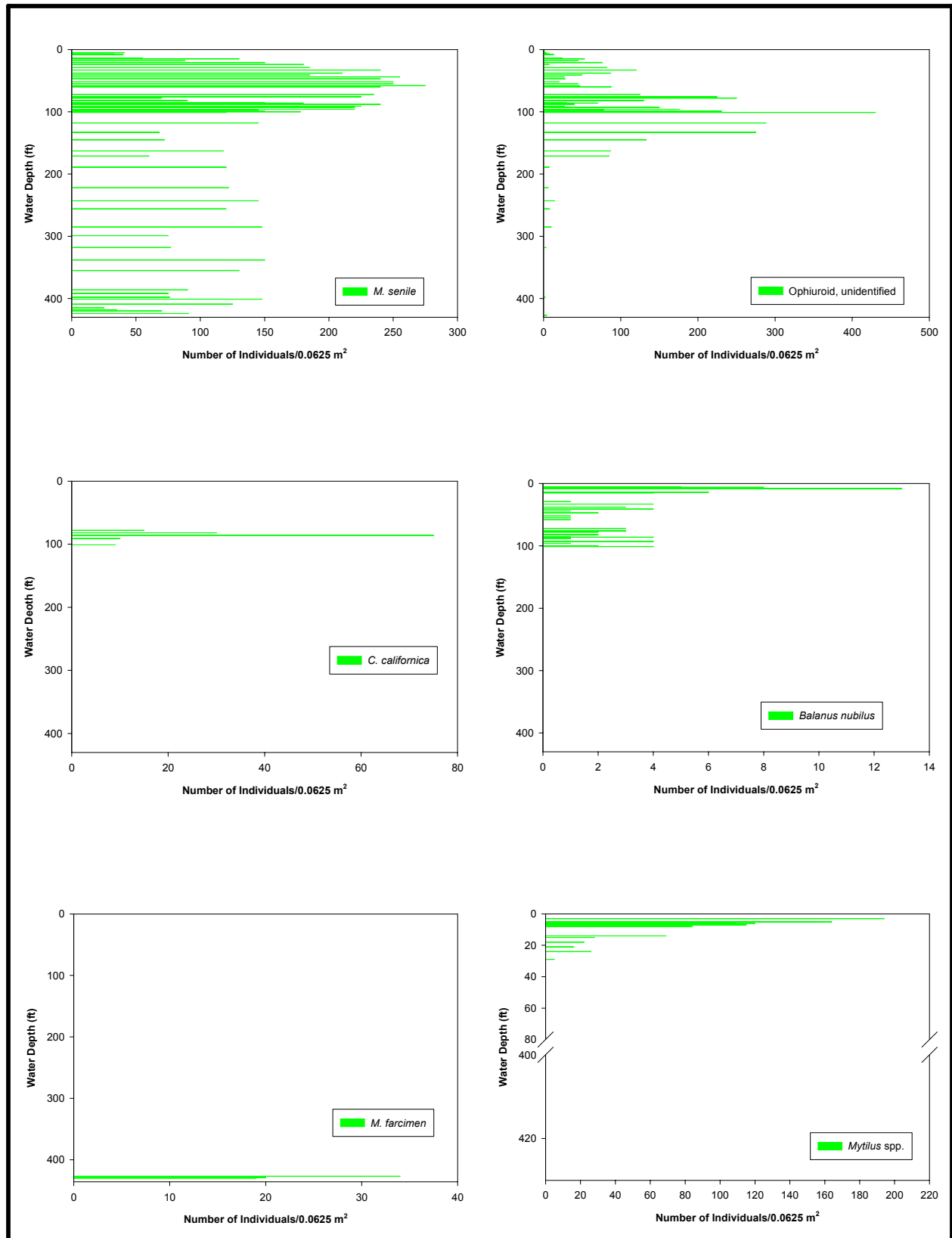


Figure 3-10. Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Hidalgo determined from quantitative slide analysis.

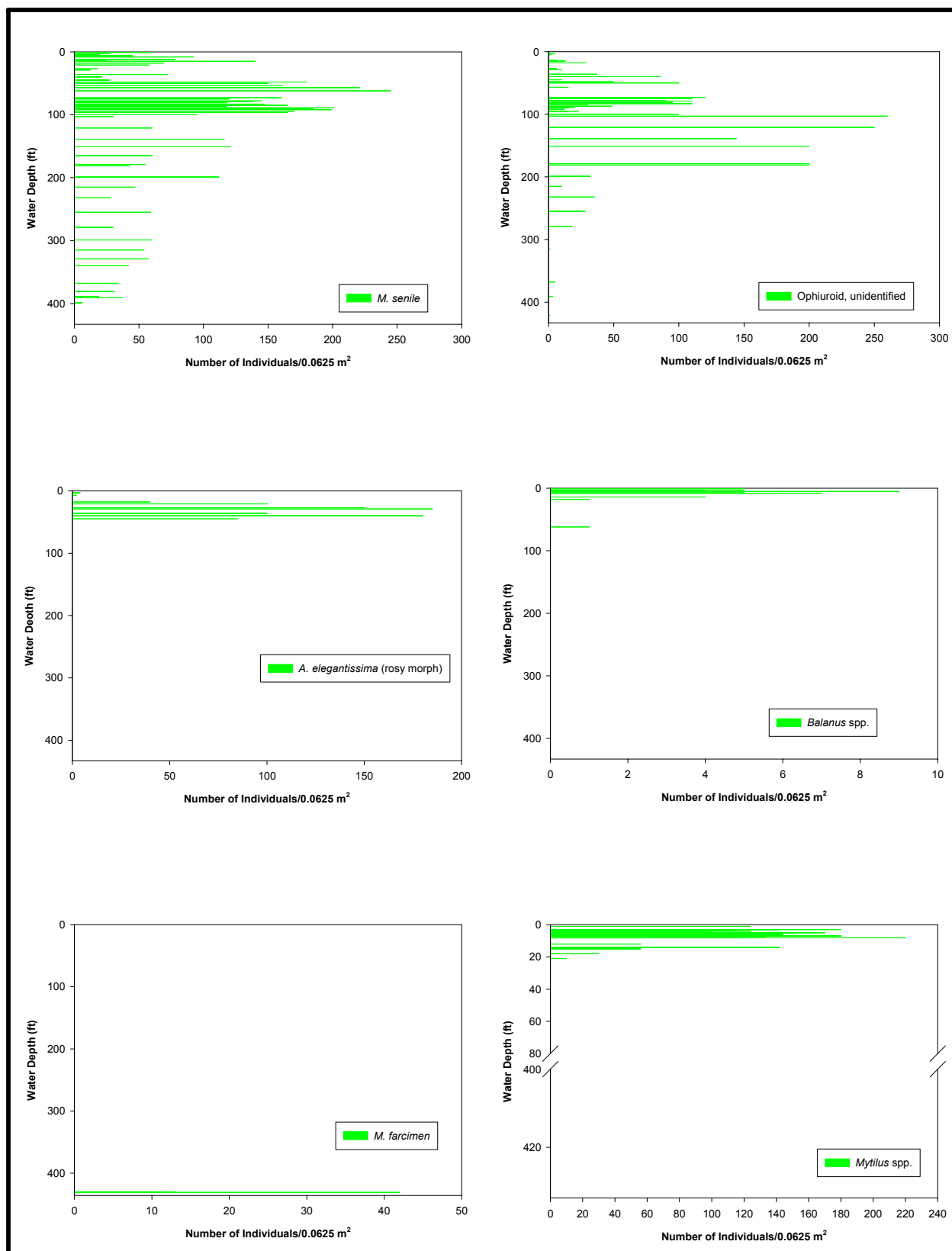


Figure 3-11. Density and depth distribution of the six numerically dominant taxa on Leg B1 of Platform Hidalgo determined from quantitative slide analysis.

In terms of unique characteristics, Platform Hidalgo exhibited the following trends: (1) a narrow barnacle zone (*Balanus nubilus*, *Balanus* spp.) within the upper 30 m (100 ft) of the platform; (2) a relative paucity of the strawberry anemone, *Corynactis californica* (present only intermittently in its depth range on Leg A1 and absent from Leg B1), and concurrent replacement of the strawberry anemone by *Anthopleura elegantissima* (rosy morph) on Leg B1; and (3) a robust zone of *Metridium farcimen* along the deepest portions of the platform.

3.3.5 Platform Habitat

Physical Characteristics

Platform Habitat, operated by Plains Exploration & Production Company, is located on Lease OCS-P 0234 (Pitas Point Field, Pitas Point Unit), approximately 12.5 km (6.7 nmi) from shore in the eastern Santa Barbara Channel. This 8-legged platform was installed on 9 October 1981 in a water depth of 88 m (290 ft).

Community Description

Leg A1 was sampled at Platform Habitat from the intertidal zone to the base of the platform leg. Based on complete analysis of 70 photographs, 43 taxa were identified, of which nearly 35 percent (15) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with a few specimens enumerated at higher taxonomic levels. Only three floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; coralline algae (*Corallina*); foliose red algae) were among the 43 total taxa noted.

On Leg A1, the six most dominant taxa (based on total density, in descending order) included *Corynactis californica*, *Mytilus* spp., *Metridium senile*, *Ophiothrix spiculata*, *Balanus nubilus*, and the rosy morph form of *Anthopleura elegantissima* (**Table 3-11**). *Ophiothrix spiculata* had the highest frequency of occurrence (40 out of 70 photographs), followed closely by *Balanus nubilus* and *Corynactis californica*. *Corynactis californica* exhibited the highest average density per occurrence at 448 individuals/0.0625 m², with a dominant presence in the 17 to 66 m (56 to 217 ft) depth range. The next highest average density was significantly lower, exhibited by *Mytilus* spp., at 33 individuals/0.0625 m². In terms of percent cover, prevalent species on Leg A1 included (in descending order) *Corynactis californica*, *Mytilus* spp., an unidentified zoanthid anemone (*Palythoa*), *Anthopleura elegantissima* (rosy morph), filamentous red algae, and *Ophiothrix spiculata*.

Based on videotape review, algal depth on Leg A1 extended from the upper portions of the intertidal zone to a maximum depth of approximately 12 m (40 ft). Results of whole slide analysis, however, indicated algal presence (dominated by filamentous red algae – *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.) extending to a depth of 19 m (61 ft).

A discontinuous zone of *Mytilus* was noted on Platform Habitat, with mussels present between the intertidal zone and 6 m (20 ft) and between 9 and 16 m (30 and 52 ft) (**Table 3-11**). Maximum abundance of *Mytilus* was 80 individuals/0.0625 m², or 1,280 individuals/m², found at a depth of 3 m (9 ft). *Metridium senile*, *Ophiothrix spiculata*, *Balanus nubilus*, and *Anthopleura elegantissima* (rosy morph) were co-dominants within the *Mytilus* zone (**Photos 17 and 18**).

Table 3-11. Dominant taxa on Leg A1 of Platform Habitat identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Corynactis californica</i>	14,799	448.5	47.1	12-700	8; 56-205; 217
<i>Mytilus</i> spp.	847	32.6	37.1	3-80	4-19; 30-52
<i>Metridium senile</i>	594	22.8	37.1	1-60	4-19; 29-37; 48-52; 77; 123; 262
<i>Ophiothrix spiculata</i>	575	14.4	57.1	1-73	4-7; 9; 13-19; 30-37; 46-56; 70-172; 178; 275; 283
<i>Balanus nubilus</i>	483	12.7	54.3	1-64	4-35; 60-81; 94-108; 123-134
<i>Anthopleura elegantissima</i> (rosy morph)	333	19.6	24.3	1-75	4-9; 18-37
<i>Paracyathus stearnsii</i>	331	20.7	22.9	1-53	94-190; 205; 217-223
<i>Triopha catalinae</i>	324.5	10.8	42.9	0.5-95	48-52; 60; 68-72; 78; 83-129; 139-175; 190-259; 283
<i>Metridium</i> spp.	107	7.6	20.0	1-25	120; 178-190; 196; 213-259; 269-283
<i>Corallina</i> spp.	53	4.4	17.1	1-8	123-129; 152-205
<i>Staurocalyptus</i> sp.	53	6.6	11.4	2-20	41; 46-52; 83; 123-134
Turf	29	1.0	41.4	1 (max)	35; 60; 68-72; 80; 83-129; 139-175; 190-259; 283
Percent Cover:					
<i>Corynactis californica</i>		73.5	47.1	1-100	8; 56-205; 217
<i>Mytilus</i> spp.		40.6	37.1	4-100	4-19; 30-52
Zoanthid (<i>Palythoa</i>)		32.3	15.7	1-99	52; 134-152; 205; 223; 262-279
<i>Anthopleura elegantissima</i> (rosy morph)		23.0	24.3	1-95	4-9; 18-37
Filamentous red algae		22.6	32.9	1-50	4-11; 18-19; 29-34; 41; 46-52; 61
<i>Metridium senile</i>		11.5	37.1	0.5-30	4-19; 29-37; 48-52; 77; 123; 262
<i>Ophiothrix spiculata</i>		10.8	57.1	1-60	4-7; 9; 13-19; 30-37; 46-56; 70-172; 178; 275; 283
Turf		10.5	41.4	0.5-95	35; 60; 68-72; 80; 83-129; 139-175; 190-259; 283
Sponge, tan encrusting		7.9	20.0	1-40	4; 6-7; 9; 13-19; 29-35; 175
<i>Paracyathus stearnsii</i>		5.2	22.9	1-10	94-190; 205; 217-223
Sponge, white encrusting		4.7	15.7	0.5-10	48-52; 76; 108; 123-139; 158; 175-178
<i>Ulva</i> spp.		2.0	1.4	2	5

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Seventy (70) photographs were analyzed from Leg A1.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.



Photo 17. View of (1) *Mytilus* spp., (2) *Metridium senile*, (3) *Balanus* spp., and (4) *Ophiothrix spiculata* at -4 m (-13 ft), Leg A1, Platform Habitat.

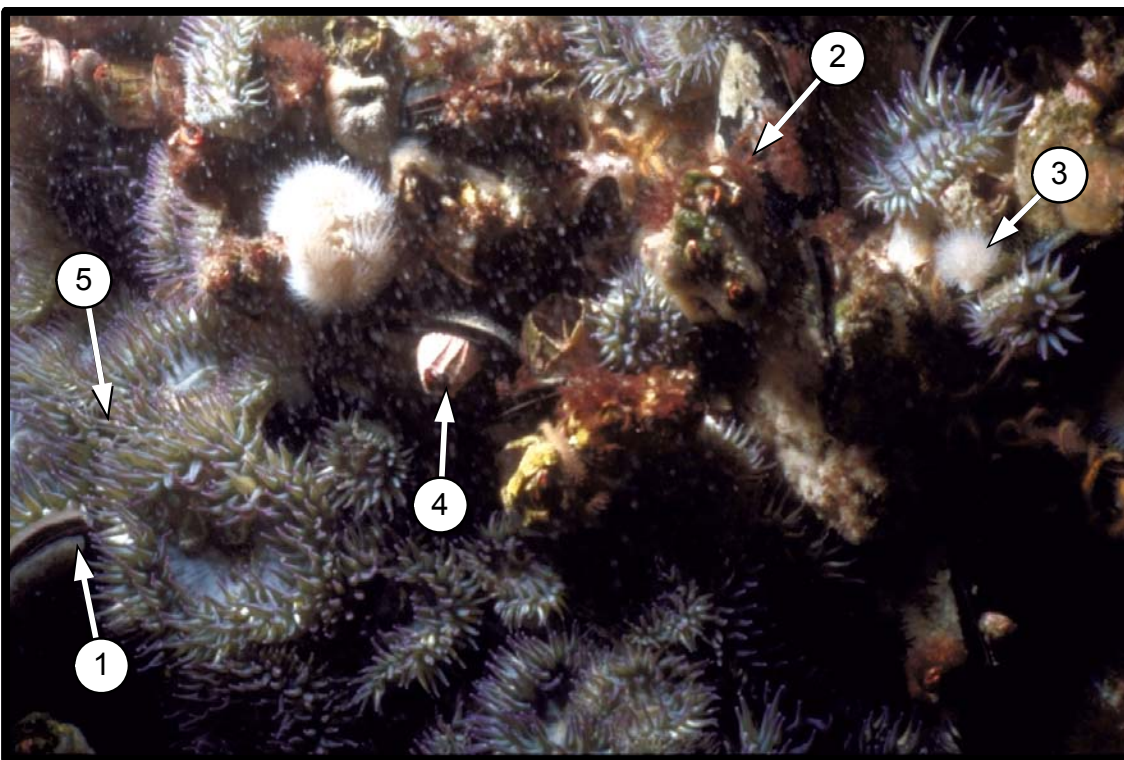


Photo 18. View of (1) *Mytilus* spp., (2) filamentous red algae, (3) *Metridium senile*, (4) *Balanus* spp., and (5) *Anthopleura elegantissima* (rosy morph) at -5 m (-18 ft), Leg A1, Platform Habitat.

Ophiothrix spiculata was also present in relatively high numbers in association with *Corynactis californica* and other encrusters (**Photo 19**). Below 15 m (50 ft), an unidentified zoanthid anemone (*Palythoa*) occurred intermittently to the base of the leg, often in a dense aggregation (**Photo 20**).

A graphic presentation of relative density (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present on Leg A1 is provided in **Figure 3-12**. In terms of unique characteristics, Platform Habitat exhibited the following: (1) an intermittent *Mytilus* zone; (2) a broadly distributed anthozoan community (i.e., *Metridium*, *Corynactis*, *Anthopleura*); and (3) dense aggregations of an unidentified zoanthid.

3.3.6 Platform Irene

Physical Characteristics

Platform Irene, operated by Plains Exploration & Production Company, is located on Lease OCS-P 0441 (Pt. Pedernales Unit), approximately 7.5 km (4.0 nmi) from shore in the southern Santa Maria Basin. This 8-legged platform was installed on 7 August 1985 in a water depth of 74 m (242 ft).

Community Description

Leg A1 was sampled at Platform Irene from the intertidal zone to the base of the platform leg. Based on complete analysis of 64 photographs, 39 taxa were identified, of which nearly 41 percent (16) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with a few specimens enumerated at higher taxonomic levels. Only four floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; foliose red algae; encrusting green alga; *Ulva*) were among the 39 total taxa noted.

Dominant taxa, based on total density, included *Metridium senile*, *Mytilus californianus*, *Tetraclita squamosa*, *Balanus* spp., *Anthopleura elegantissima* (rosy morph), and calcareous worm tubes (**Table 3-12**). *Metridium senile* had the highest frequency of occurrence (59 out of 64 photographs), followed closely by *Mytilus* spp. and a yellow encrusting sponge. *Metridium senile* exhibited the highest average density per occurrence at 331 individuals/0.0625 m², with a dominant presence in across most of the platform leg. The next highest average densities were significantly lower, exhibited by calcareous worm tubes, *Mytilus californianus*, and *Tetraclita squamosa*, at 52, 43, and 42 individuals/0.0625 m², respectively.

In terms of percent cover, prevalent species on Leg A1 included (in descending order) *Metridium senile*, a tan encrusting tunicate, *Tetraclita squamosa*, a tan encrusting sponge, *Mytilus californianus*, and calcareous worm tubes. *Metridium senile* represents the largest single contributor to total percent cover, ranging from three to 90 percent and averaging 66 percent. In the upper reaches of Leg A1, *M. senile* co-occurs with *Mytilus* and barnacles (e.g., *Tetraclita*), as shown in **Photo 21**. Further down Leg A1, at 9.4 m (31 ft), *Metridium* continues to share space with *Mytilus* (**Photo 22**). As depth increases, *M. senile* co-occurs with encrusting sponges (**Photo 23**), or predatory starfish, calcareous worm tubes, and its congener, *M. farcimen* (**Photo 24**).

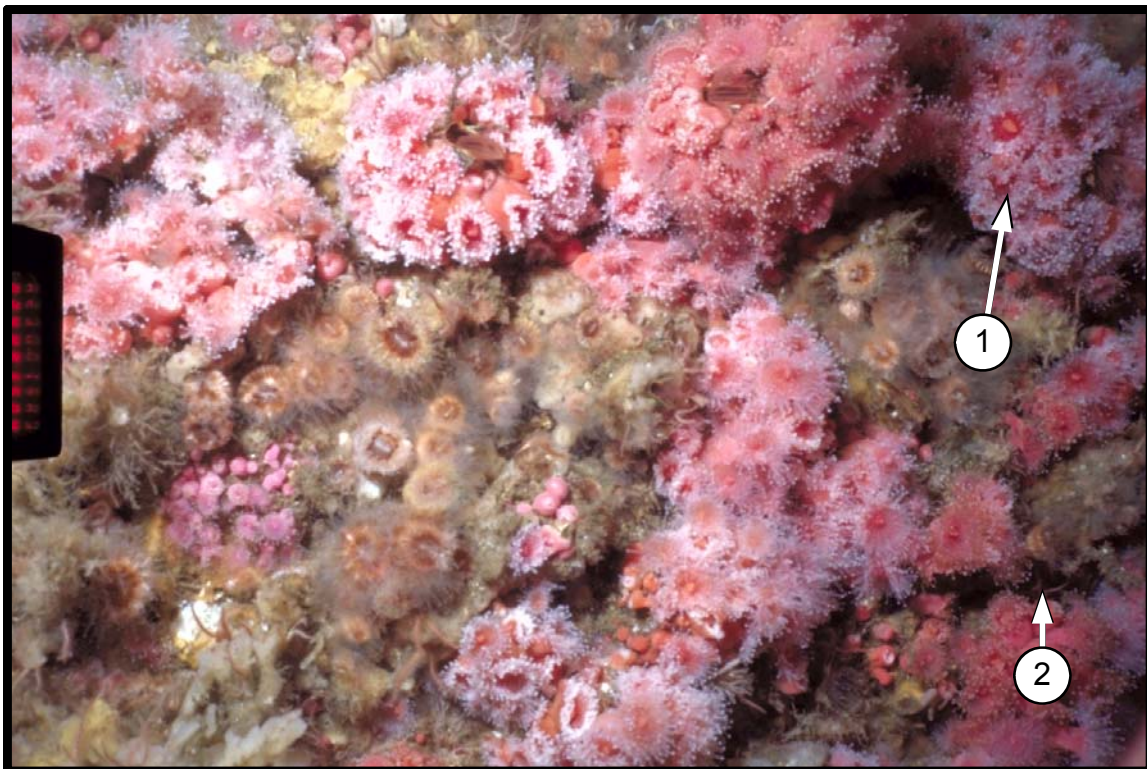


Photo 19. View of (1) *Corynactis californica*, (2) *Ophiothrix spiculata*, and encrusters at -41 m (-134 ft), Leg A1, Platform Habitat.



Photo 20. View of (1) undescribed zoanthid anemones (*Palythoa*) at -82 m (-269 ft), Leg A1, Platform Habitat.

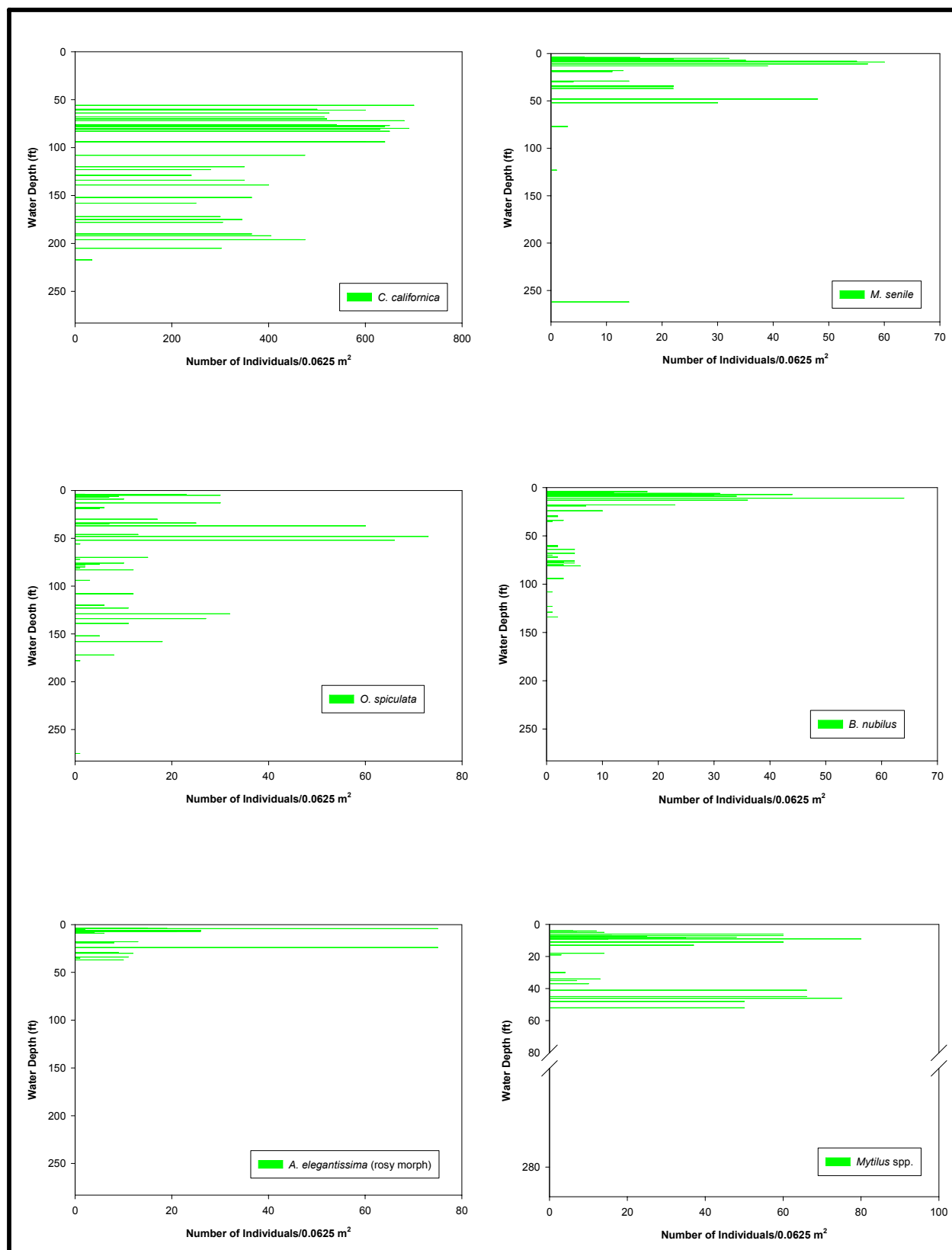


Figure 3-12. Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Habitat determined from quantitative slide analysis.

Table 3-12. Dominant taxa on Leg A1 of Platform Irene identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Metridium senile</i>	19,522	330.9	92.2	15-510	2-4; 8-232
<i>Mytilus californianus</i>	1,401	42.5	51.6	4-124	1-31; 48-51
<i>Tetraclita squamosa</i>	672	42.0	25.0	7-200	1-8; 24-25
<i>Balanus</i> spp.	190	10.0	29.7	1-34	10-11; 14; 28; 40; 43-51; 58-62; 68-131
<i>Anthopleura elegantissima</i> (rosy morph)	129	10.8	18.8	1-25	4; 11; 14; 23-38; 40
Worm tubes, calcareous	103	51.5	3.1	3-100	43; 232
<i>Corynactis californica</i>	101	10.1	15.6	1-33	2-4; 6-8; 10
<i>Ophiothrix spiculata</i>	36	4.0	14.1	2-7	10-13; 17; 23-27; 28
<i>Mytilus</i> spp.	23	3.8	9.4	2-6	38; 41; 62; 65; 75; 79
<i>Anthopleura</i> spp. (whitish, no rose)	22	22.0	1.6	22	6
Sponge, yellow encrusting	19	1.0	29.7	1 (max)	28; 43; 58; 71-131; 151-206
<i>Pisaster ochraceus</i>	15	1.5	15.6	1-3	24-39; 179; 221
Percent Cover:					
<i>Metridium senile</i>		66.0	92.2	3-90	2-4; 8-232
Tunicate, encrusting tan		50.0	1.6	50	39
<i>Tetraclita squamosa</i>		48.8	25.0	10-90	1-8; 24-25
Sponge, tan encrusting		32.4	7.8	1-60	28; 38; 40; 43; 179
<i>Mytilus californianus</i>		29.5	51.6	2-85	1-31; 48-51
Worm tubes, calcareous		25.5	3.1	1-50	43; 232
Sponge, gray encrusting		17.5	37.5	2-50	13, 41; 48-173; 182-189
Turf		10.2	7.8	1-25	1; 3-4; 9
Alga, encrusting green		10.0	1.6	10	170
<i>Anthopleura elegantissima</i> (rosy morph)		3.9	18.8	0.5-10	4; 11; 14; 23-38; 40
Sponge, yellow encrusting		3.3	29.7	0.1-15	28; 43; 58; 71-131; 151-206
<i>Ulva</i> spp.		3.0	1.6	3	3

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Fuzz (Appendix C) = Turf (Table 3-12). Sixty-four (64) photographs were analyzed from Leg A1.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.



Photo 21. View of (1) *Mytilus californianus*, (2) *Metridium senile*, (3) *Tetraclita squamosa*, and other barnacles at -1 m (-4 ft), Leg A1, Platform Irene.

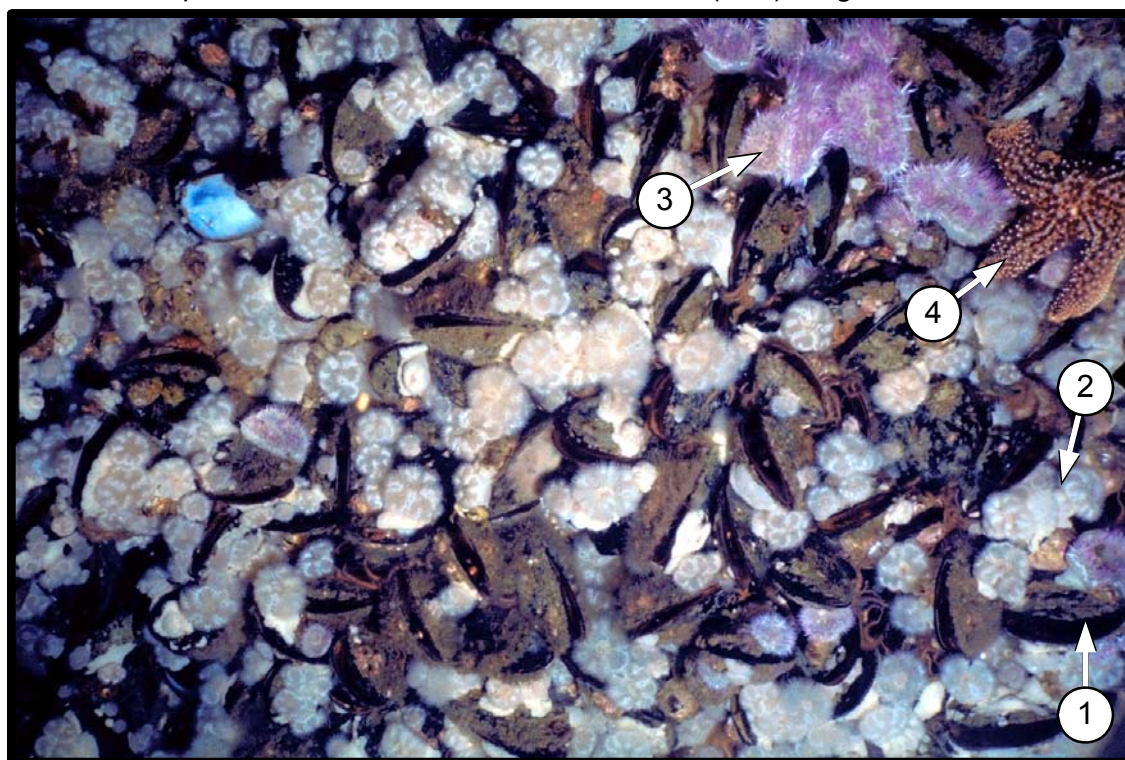


Photo 22. View of (1) *Mytilus californianus*, (2) *Metridium senile*, (3) *Anthopleura elegantissima* (rosy morph), and (4) *Pisaster ochraceus* at -9 m (-31 ft), Leg A1, Platform Irene.

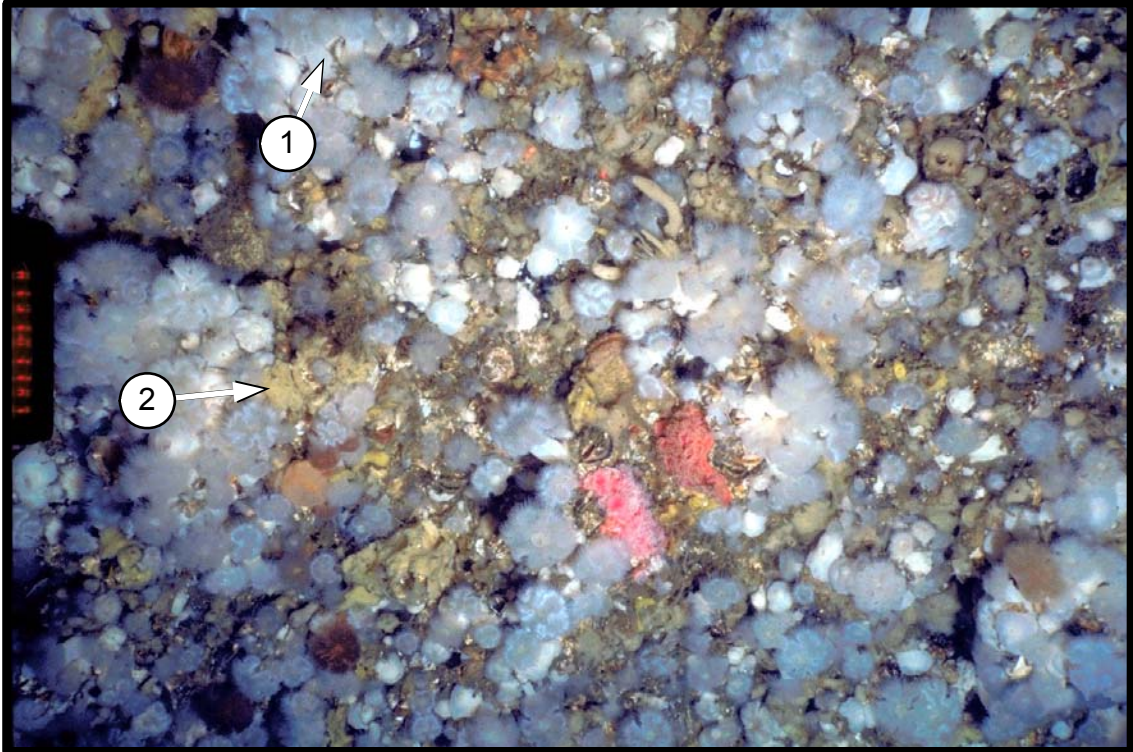


Photo 23. View of (1) *Metridium senile* and (2) encrusting sponges at -44 m (-145 ft), Leg A1, Platform Irene.

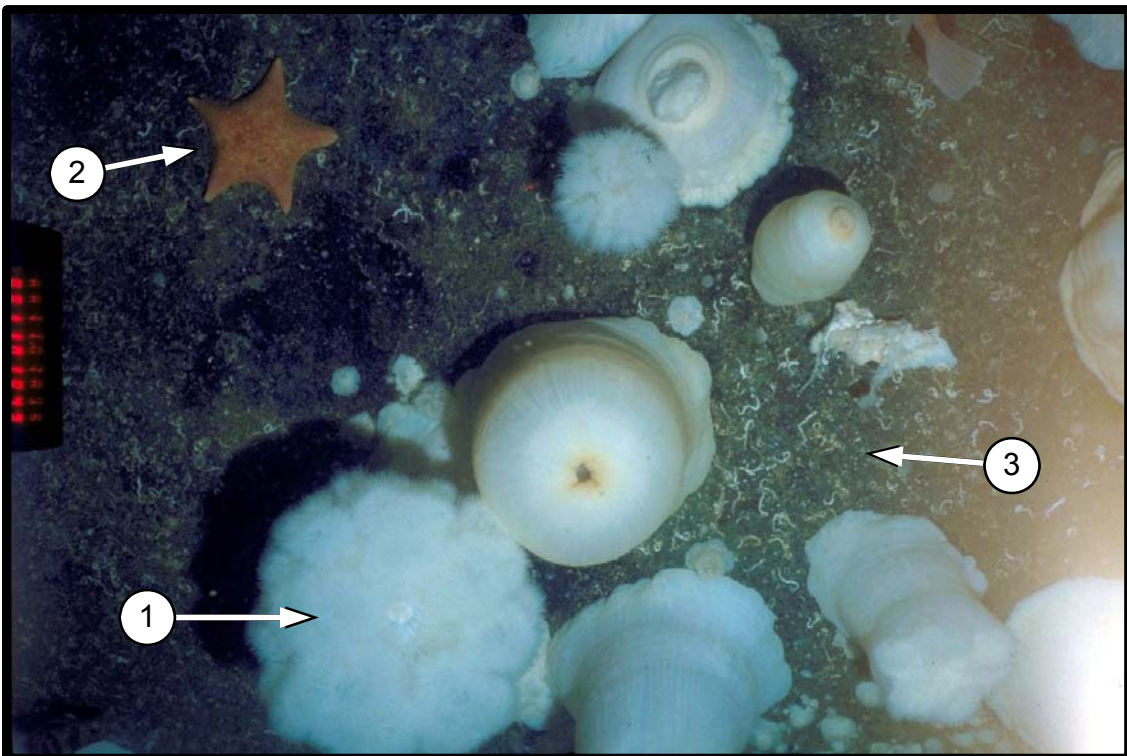


Photo 24. View of (1) *Metridium farcimen* (and possibly *M. senile*), (2) *Asterina miniata*, and (3) calcareous worm tubes at -71 m (-232 ft), Leg A1, Platform Irene.

Based on videotape review, algal depth on Leg A1 extended from the upper portions of the intertidal zone to a maximum depth of 23 m (75 ft). Results of whole slide analysis indicated algal presence (dominated by filamentous red algae – *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc. and several green algal species) extending to a depth of only 12 m (41 ft).

A graphic presentation of relative density (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present on Leg A1 is provided in **Figure 3-13**. In terms of unique characteristics, Platform Irene exhibited the following: (1) a broadly distributed anthozoan community (i.e., *Metridium*, *Corynactis*, *Anthopleura*); and (2) a well-defined *Mytilus californianus* zone extending to 16 m (51 ft), with co-dominants *Tetraclita squamosa*, *Balanus* spp., *Anthopleura elegantissima*, and *Metridium senile*.

3.4 Diablo and Nifty Rocks – Photographic Interpretation

3.4.1 Physical Characteristics

Diablo Rock is located several kilometers to the west of Diablo Point, off the northern coastline of Santa Cruz Island, within the waters of the western Santa Barbara Channel (see **Figure 2-3**). Water depth at the base of this feature was approximately 33 m (108 ft). Similarly, Nifty Rock is located several kilometers east-southeast of Harris Point, off the northwestern point of San Miguel Island (see **Figure 2-4**). Water depth at the foot of this rock outcrop was approximately 15 m (50 ft).

3.4.2 Community Description

A total of 44 taxa was identified from the photographic analysis of 22 photographs acquired at Diablo and Nifty Rocks. Fourteen of the 44 taxa were monospecific (i.e., species level identification), with the remaining taxa identified to genus level or higher. Among the 44 taxa, several algal taxa were observed in photographs from Diablo and Nifty Rocks, including filamentous red algae, *Bossiella* spp., *Codium* spp., an encrusting alga (*Lithothamnion*), two green clump algae (i.e., one *Codium*-like, the other non-*Codium*-like), and brown algae (clump and blades). The six most dominant taxa (based on total density, in descending order) at the rock outcrops included *Corynactis californica*, *Chthalamus* spp., *Balanus* spp., *Anthopleura xanthogrammica*, *Ophiothrix spiculata*, and *Mytilus californianus* (**Table 3-13**). *Corynactis californica* had the highest frequency of occurrence (15 out of 22 photographs) and exhibited the highest average density per occurrence at 132 individuals/0.0625 m². In terms of percent cover, prevalent species on Diablo and Nifty Rocks included (in descending order) an unidentified sponge, a composite of encrusters, *Chthalamus* spp., *Corynactis californica*, and filamentous red algae.

Two anemone species, *Anthopleura xanthogrammica* and *A. elegantissima* (rosy morph), were both prominent numerical dominants at Diablo and Nifty Rocks. In total, these two anemone species occurred in nearly one-third of the photographs analyzed. While *A. xanthogrammica* was completely absent at all of the platforms sampled, the rosy morph form of *A. elegantissima* was among the dominant species observed at all six platforms. Other dominants noted at Diablo and Nifty Rocks occurred with lower frequency, typically in sufficiently high numbers on those limited instances to be a density dominant.

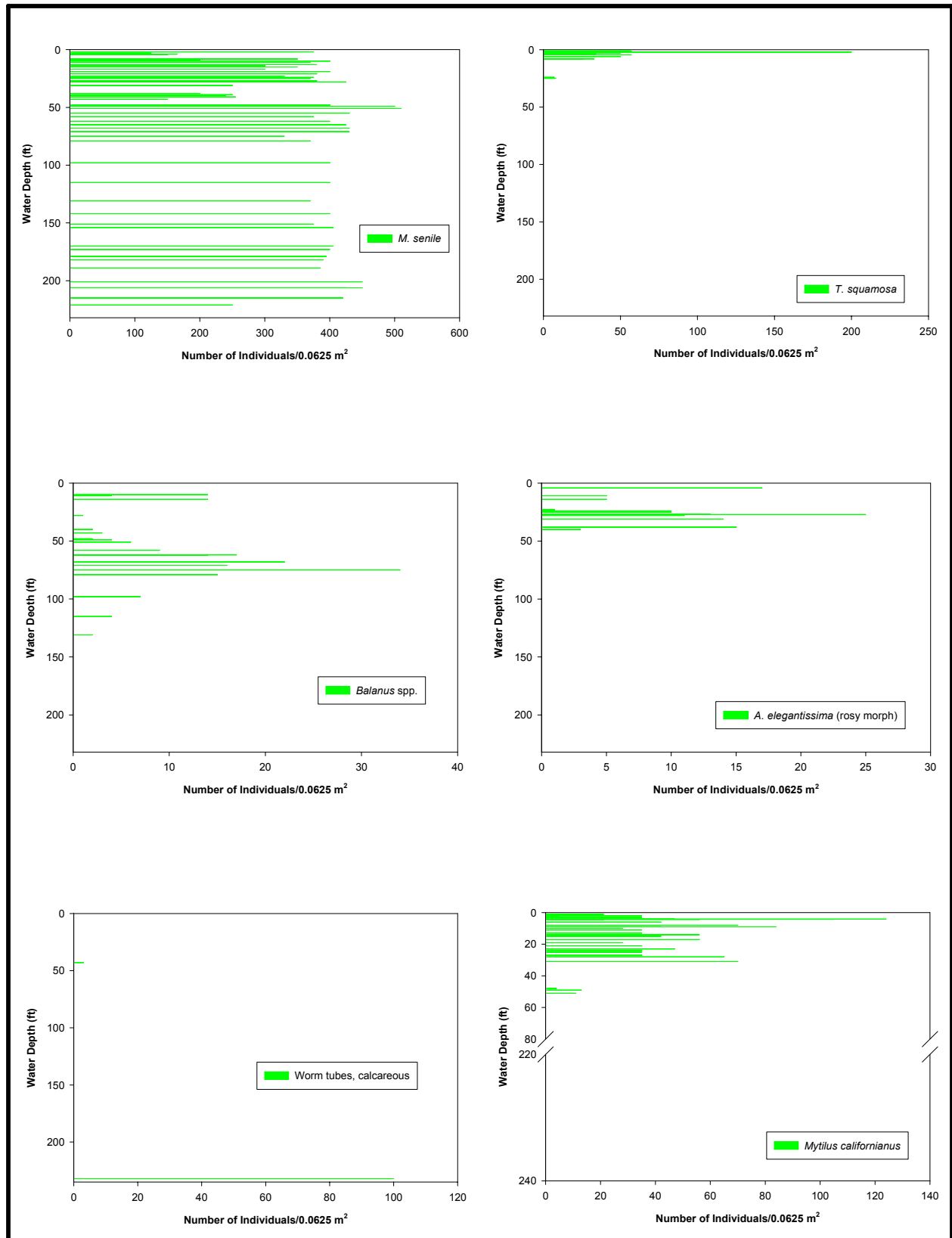


Figure 3-13. Density and depth distribution of the six numerically dominant taxa on Leg A1 of Platform Irene determined from quantitative slide analysis.

Table 3-13. Dominant taxa on natural substrate of Diablo and Nifty Rocks identified during quantitative slide analysis.

Taxon	Total	Average per Occurrence	Frequency (%)	Minimum-Maximum	Depth of Occurrence (ft subsurface)
Density:					
<i>Corynactis californica</i>	1,982	132.1	68.2	2-375	25; 35; 45-50
<i>Chthalamus</i> spp.	180	20.0	40.9	3-54	25; 35; 45-55
<i>Balanus</i> spp.	67	22.3	13.6	2-60	25
<i>Anthopleura xanthogrammica</i>	60	12.0	22.7	1-25	15; 25; 35
<i>Ophiothrix spiculata</i>	52	26.0	9.1	21-31	40; 48
<i>Mytilus californianus</i>	45	15.0	13.6	4-31	25
<i>Anthopleura elegantissima</i> (rosy morph)	37	18.5	9.1	7-30	25; 35
<i>Metridium senile</i>	33	33.0	4.5	33 (max)	15
<i>Balanophyllia</i>	31	31.0	4.4	31 (max)	55
<i>Bossiella</i> spp.	26	4.3	27.3	1-10	15; 25; 35; 45
<i>Strongylocentrotus purpuratus</i>	25	2.3	50.0	1-7	15-45; 55
Dendrochirotida	24	8.0	13.6	4-15	40; 45-48
Percent Cover:					
Sponge, unidentified		50.0	4.5	50 (max)	25
Encruster, all		34.0	13.6	2-50	25; 35
<i>Chthalamus</i> spp.		28.6	40.9	2-80	25; 35; 45-55
<i>Corynactis californica</i>		26.4	68.2	0.5-75	25; 35; 45-50
Filamentous red algae		21.8	77.3	1-75	25-55
Alga, encrusting (<i>Lithothamnion</i>)		21.5	63.6	0.5-60	25; 35; 40-55
<i>Balanus</i> spp.		21.3	13.6	2-60	25
Foliose red algae		20.0	4.5	20	35
Turf		17.5	27.3	5-30	15-35; 45-55
Alga, green clump (<i>Codium</i> -like)		12.5	9.1	5-20	50; 55
<i>Ophiothrix spiculata</i>		12.5	9.1	5-20	45
Bryozoa, Staghorn, yellow		9.1	22.7	0.5-20	35-50

Notes: Total = total number of individuals in all photographs. Minimum-maximum = minimum and maximum number of individuals/0.0625 m², or minimum and maximum percent cover estimates for a 0.0625 m² photoquadrat. Twenty-two (22) photographs were analyzed from Diablo and Nifty Rocks.

Taxonomic notes: Filamentous red algae include *Polysiphonia*, *Neoptilota*, *Antithamnion*, etc.

Of the density dominant taxa noted at the outcrops, four taxa were also prominent species on the platforms – *Ophiothrix spiculata*, *Mytilus californianus*, *Corynactis californica*, and *Metridium senile*. Depth of occurrence between outcrop-associated and platform-associated species was generally consistent, although deeper portions of Diablo Rock remained unsampled. At least one of the species common to both rock outcrops and platforms (e.g., *Metridium senile*) was present at depth on most platform legs (i.e., to the base of the platform legs). Other species appear to have a different depth range. For example, *Corynactis californica* typically becomes a density and percent cover dominant at deeper depths on the platforms (e.g., minimum depth of 9 m [30 ft]; normally extending to approximately 61 m [200 ft]). *Ophiothrix spiculata* occurs along the upper and middle portions of a platform leg, often to depths of 70 m (230 ft) or more.

While filamentous red algae were noted at both outcrops and on the platforms, the predominance of *Lithothamnion* in the percent cover estimations was a unique characteristic of Diablo and Nifty Rocks. In terms of total species composition, the natural rock outcrops exhibited a higher algal diversity which included filamentous red algae (e.g., *Polysiphonia*, *Neoptilota*, *Antithamnion*), an encrusting alga (*Lithothamnion*), *Bossiella* spp., *Codium*, *Codium*-like green clump alga, foliose red algae, foliose brown algae, green foliose alga, and *Ulva* spp. documented on Diablo and Nifty Rocks. While filamentous red algae were consistently and frequently observed on the platforms, foliose red algae were only occasionally noted on the platforms and green algae were relatively rare. Increased algal diversity may be attributed to one or more factors, including (1) the presence of a more complex substrate at the outcroppings (e.g., discontinuous surfaces with numerous crevices; porous or semi-porous rock surfaces); (2) closer proximity to existing and well-established algae populations (e.g., within rocky intertidal and subtidal communities on the northern Channel Islands); and/or (3) different invertebrate fauna (e.g., different composition of herbivorous invertebrates).

It is also noteworthy that 44 taxa were identified from analysis of a limited number of photographs taken at Diablo and Nifty Rocks, as compared to the higher number of platform-associated photographs (e.g., typically 34 to 45 photographs in the *Mytilus* zone). This suggests that Diablo and Nifty rocks were characterized by higher species diversity than comparable depth zones on artificial structures such as platforms.

The epibiotical variability of the Diablo and Nifty Rock area is evident in a review of the representative photography. **Photo 25** is a view of yellow staghorn bryozoa, *Strongylocentrotus purpuratus*, *S. franciscanus*, *Urticina* sp., a solitary *Anthopleura*, and turf at 14 m (45 ft) at Diablo Rock. **Photo 26** is a view of *Paracyathus stearnsii*, *Balanophyllia elegans*, turf, and an encrusting alga (*Lithothamnion*) at 17 m (55 ft) at Nifty Rock. **Photo 27** shows *Mytilus californianus*, filamentous red algae, an encrusting alga (*Lithothamnion*), *Anthopleura xanthogrammica*, and *A. elegantissima* at 8 m (25 ft) at Diablo Rock. **Photo 28** is a view of *Corynactis californica*, an encrusting alga (*Lithothamnion*), and *Chthalamus* spp. at 15 m (50 ft) at Diablo Rock. **Photo 29** is a view of *Anthopleura*, filamentous red algae, and *Strongylocentrotus purpuratus* at 11 m (35 ft) at Diablo Rock. **Photo 30** is a view of a *Bossiella*-type coralline alga at 14 m (45 ft) at Nifty Rock.

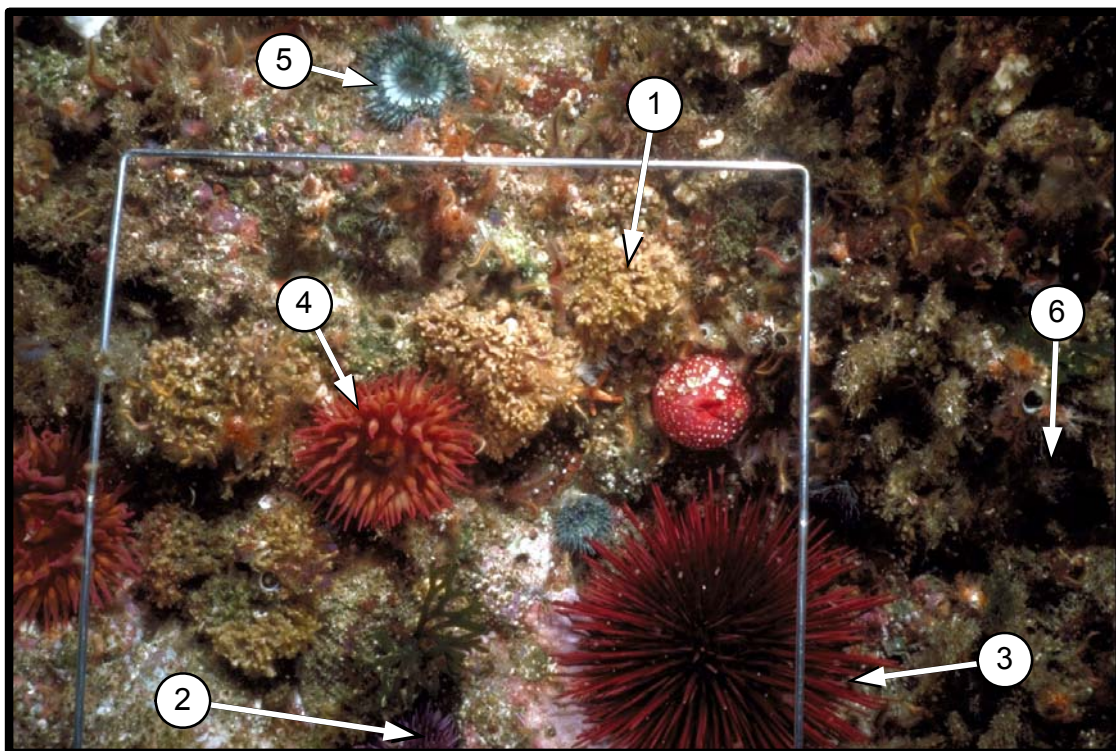


Photo 25. View of (1) yellow staghorn bryozoa, (2) *Strongylocentrotus purpuratus*, (3) *S. franciscanus*, (4) *Urticina* spp., (5) a solitary *Anthopleura* spp., and (6) turf at -14 m (-45 ft), Diablo Rock.

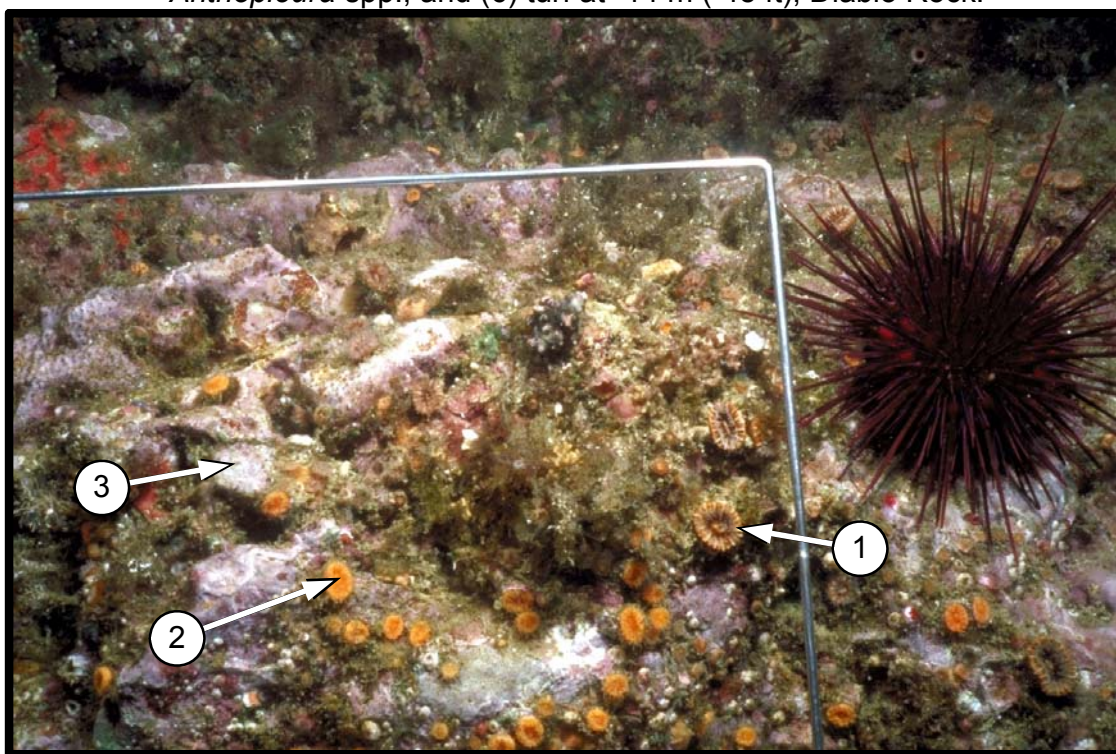


Photo 26. View of (1) *Paracyathus stearnsii*, (2) *Balanophyllia elegans*, (3) an encrusting alga (*Lithothamnion*), and turf at -17 m (-55 ft), Nifty Rock.

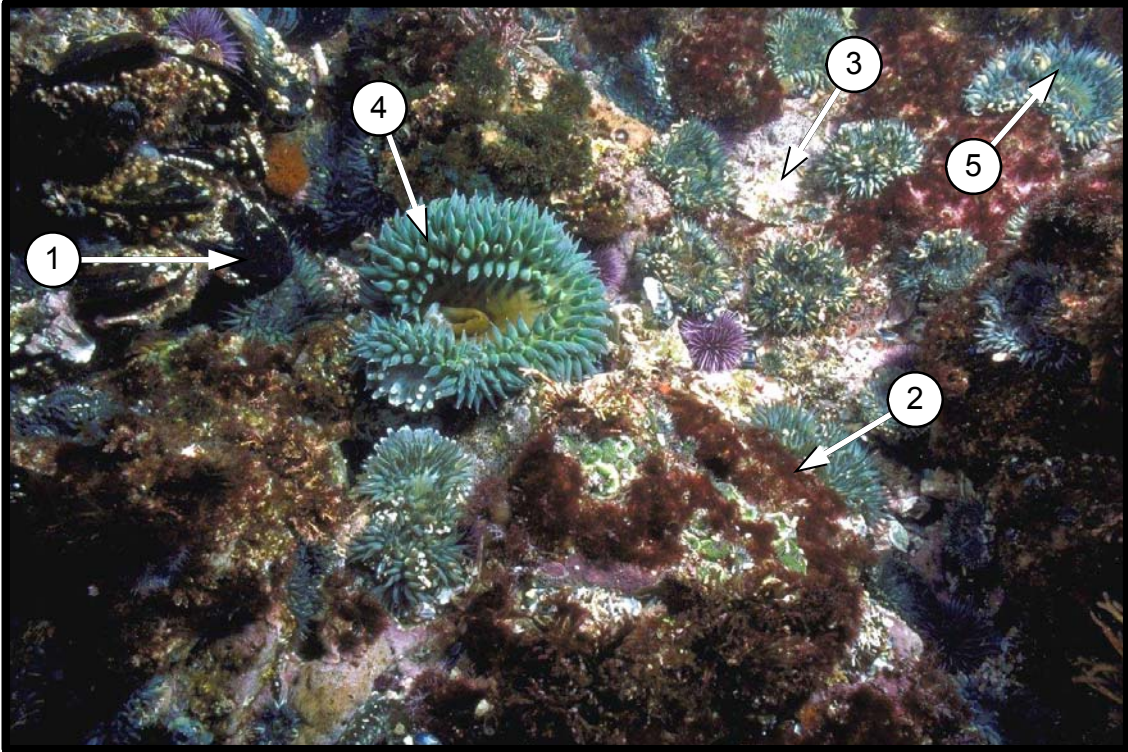


Photo 27. View of (1) *Mytilus californianus*, (2) filamentous red algae, (3) an encrusting alga (*Lithothamnion*), (4) *Anthopleura xanthogrammica*, and (5) *A. elegantissima* at -8 m (-25 ft), Diablo Rock.

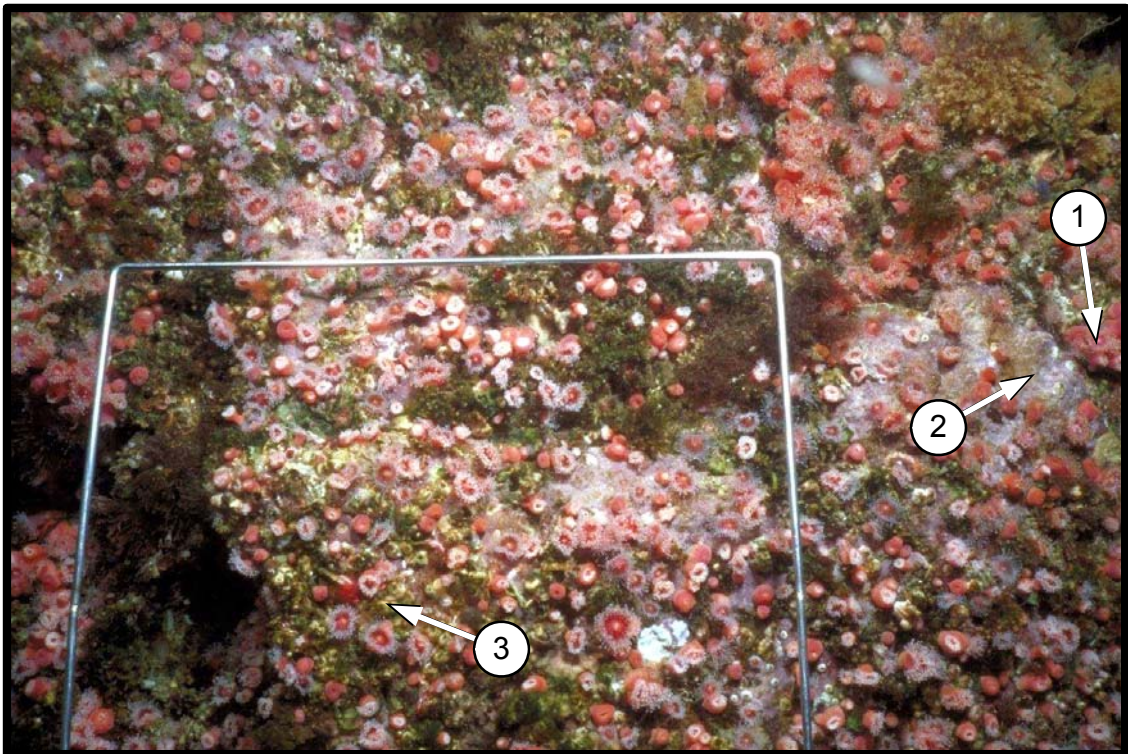


Photo 28. View of (1) *Corynactis californica*, (2) an encrusting alga (*Lithothamnion*), and (3) *Chthalamus* spp. at -15 m (-50 ft), Diablo Rock.

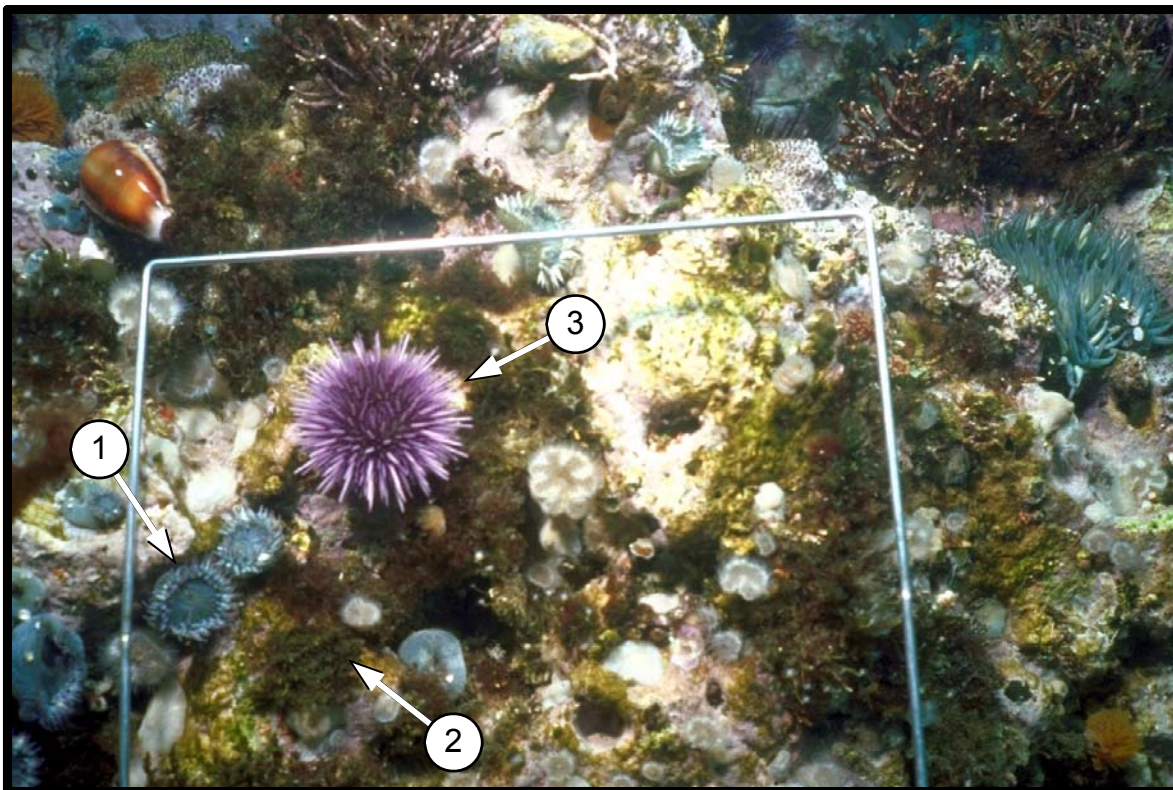


Photo 29. View of (1) *Anthopleura elegantissima*, (2) filamentous red algae, and (3) *Strongylocentrotus purpuratus* at -11 m (-35 ft), Diablo Rock.

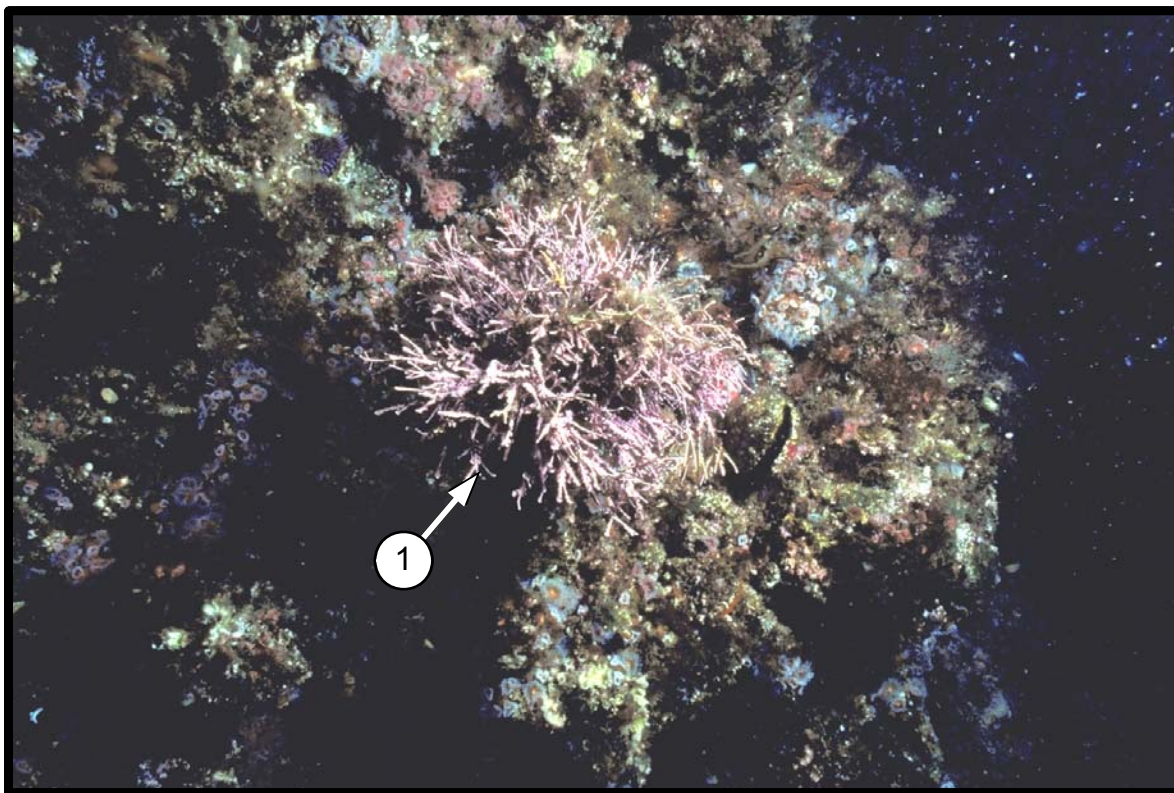


Photo 30. View of (1) a *Bossiella*-type coralline alga at -14 m (-45 ft), Nifty Rock.

A graphic presentation of relative density (i.e., numbers of individuals/0.0625 m²) of the six numerical dominants present at Diablo and Nifty Rocks is provided in **Figure 3-14**. The rock outcrops exhibited a very limited *Mytilus* zone, a prominent and broadly distributed anthozoan community (i.e., *Corynactis californica*, *Anthopleura xanthogrammica* and *A. elegantissima* [rosy morph], and *Metridium senile*), and a few species that were also present on the platforms. While there were a few common dominant taxa found on both natural outcrops and platforms (i.e., *Ophiothrix spiculata*, *Mytilus californianus*, *Corynactis californica*, and *Metridium senile*; filamentous red algae), Diablo and Nifty Rocks appear overall to support a different community than those found in association with platforms. For example, although *Mytilus* was found in limited abundance at the outcrops, there was no well-defined mussel community present. This observation contrasts sharply with the prominent mussel zones evident on all of the offshore platforms. Further, with the exception of the anthozoan community, prominent platform-associated taxa were not as prevalent at the natural rock outcrops.

3.5 Random Point Count Analysis

Random point count (PointCount'99®) analysis was completed using digital images created from the original 35-mm transparencies collected at each platform. Fifty-five taxa total were identified during the random point count analysis. The complete data set developed during this process is provided in **Appendix E**.

Table 3-14 summarizes the top 12 dominant taxa on each platform leg identified during the random point count analysis. The mean value provided represents the average number of points occupied by a given taxon in those digital images in which that taxon was present; the higher the mean, the more prevalent a particular taxon was in digital images from a platform leg. Maximum and minimum occurrence and frequency of occurrence for each dominant taxon are also identified. In instances where the maximum was 50, that taxon occupied all 50 random points placed on a particular digital image.

The random point count results have been compared to density and/or percent cover dominants identified from whole slide analysis, the latter of which were presented in **Tables 3-3** through **3-12**. Results of the random point count analysis were in excellent agreement with the dominant taxa identified from the whole slide analysis (i.e., density and percent cover dominants). For eight of the 10 platform legs, the most dominant single taxon identified on each platform leg through random point count analysis was the same as that identified during whole slide analysis. The two exceptions, Platform Harvest, Leg B2 and Platform Hidalgo, Leg B1, showed PointCount'99® dominants that were highly ranked (i.e., second and fourth, by density, respectively) on the corresponding whole slide analysis dominant list. Overall, the vast majority of PointCount'99® dominants were also whole slide analysis dominants. Exceptions were typically associated with a low frequency of occurrence of a particular taxon (i.e., either the single or limited occurrence of a taxon on a digital image).

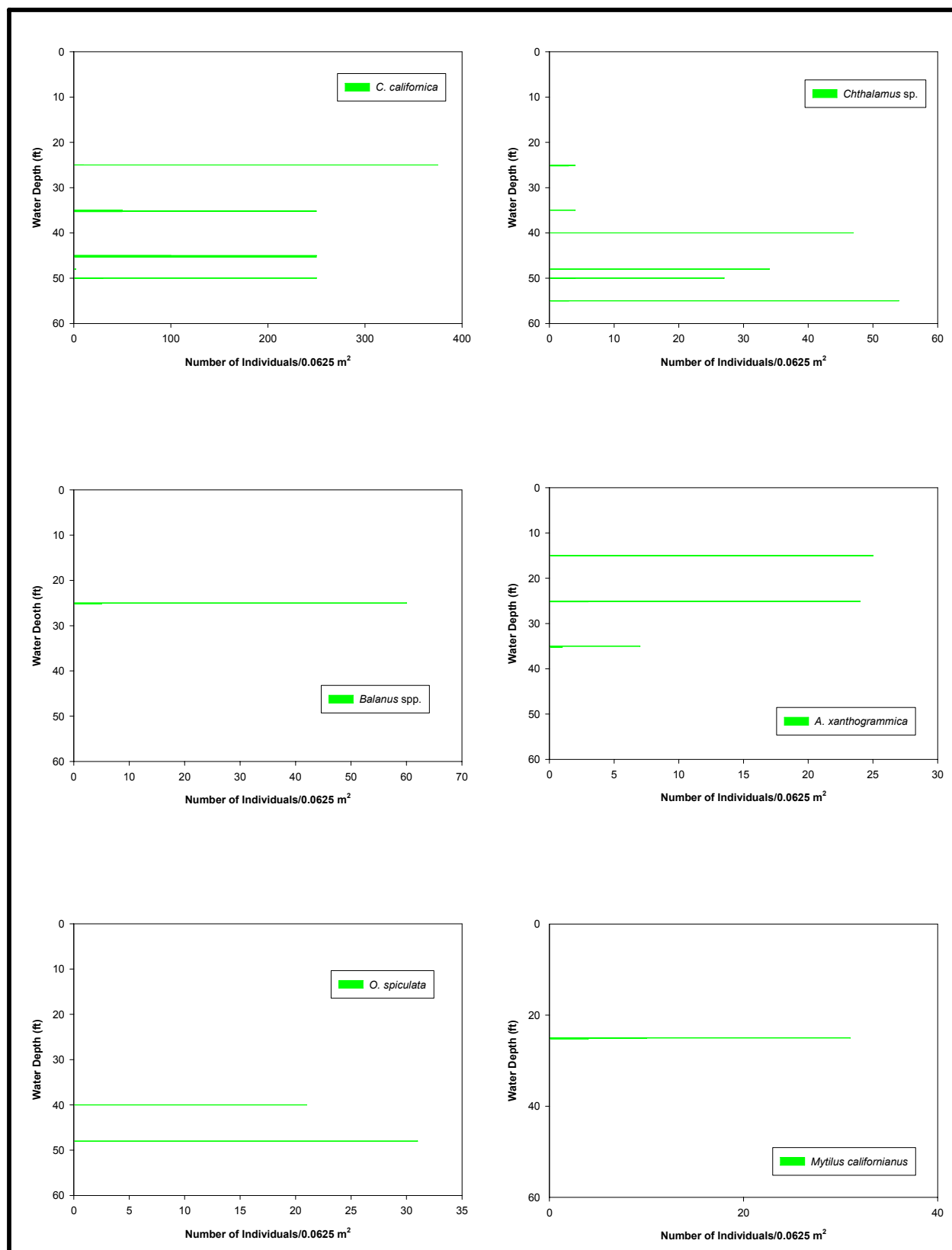


Figure 3-14. Density and depth distribution of the six numerically dominant taxa at Diablo and Nifty Rocks determined from quantitative slide analysis.

Table 3-14. Dominant taxa on the six platforms as determined by PointCount'99® analysis.

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Platform Gail:						
Leg A1 - 111 images	<i>Corynactis californica</i>	31.21	1	50	38/111	Y
	<i>Metridium senile</i>	18.88	1	47	67/111	Y
	<i>Desmophyllum dianthus</i>	15.29	1	30	17/111	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	14.85	1	50	13/111	Y
	Red Algae	14.62	2	33	26/111	Y
	<i>Mytilus</i> spp.	12.43	1	24	14/111	Y
	Zoanthidea	11.71	3	42	7/111	Y
	<i>Metridium farcimen</i>	10.20	1	34	5/111	Y
	Turf	9.86	1	35	83/111	Y
	<i>Metridium exilis</i>	8.90	1	30	30/111	Y
	<i>Ophiothrix spiculata</i>	4.25	1	10	88/111	Y
<i>Aglaophenia</i> sp.	4.00	4	4	1/111	N	
Leg B1 - 110 images	<i>Metridium exilis</i>	29.83	1	48	63/110	Y
	Turf	20.52	1	46	62/110	Y
	<i>Corynactis californica</i>	17.30	1	48	23/110	Y
	<i>Metridium senile</i>	14.31	1	34	35/110	Y
	<i>Pleurobranchaea californica</i>	9.00	9	9	1/110	N
	<i>Desmophyllum dianthus</i>	8.82	1	27	17/110	Y
	Red Algae	8.30	1	25	20/110	Y
	<i>Metridium farcimen</i>	8.00	8	8	1/110	N
	<i>Mytilus</i> spp.	7.47	1	22	17/110	Y
	Porifera	5.16	1	16	45/110	Y
	<i>Ophiothrix spiculata</i>	3.75	1	9	4/110	Y
Zoanthidea	3.75	1	6	4/110	Y	
Platform Grace:						
Leg C1 - 94 images	<i>Corynactis californica</i>	23.69	1	45	42/94	Y
	Turf	18.32	1	47	81/94	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	17.30	1	43	20/94	Y
	<i>Metridium farcimen</i>	13.50	13	14	2/94	N
	<i>Mytilus</i> spp.	12.37	1	26	19/94	Y
	<i>Obelia</i> sp.	11.83	1	26	18/94	N
	Red Algae	9.92	1	28	24/94	Y
	<i>Paracyathus stearnsii</i>	7.91	1	26	23/94	Y
	<i>Ophiothrix spiculata</i>	6.33	1	12	12/94	Y
	Rockfish	5.00	5	5	1/94	N
	<i>Metridium senile</i>	4.67	1	11	3/94	Y
	<i>Ophionereis</i> sp.	4.67	1	12	6/94	N

Table 3-14. Dominant taxa on the six platforms as determined by PointCount'99® analysis (continued).

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Leg C4 - 94 images	<i>Corynactis californica</i>	39.14	5	50	37/94	Y
	Zoanthidea	21.17	4	42	6/94	Y
	<i>Metridium senile</i>	20.55	1	45	38/94	Y
	<i>Metridium farcimen</i>	18.89	1	40	9/94	Y
	<i>Mytilus</i> spp.	15.00	1	29	25/94	Y
	Turf	10.99	1	35	72/94	Y
	<i>Metridium exilis</i>	8.00	4	14	3/94	Y
	Red Algae	7.37	1	15	19/94	Y
	<i>Ophiothrix spiculata</i>	6.93	1	20	28/94	Y
	Green Algae	6.50	4	9	2/94	N
	<i>Anthopleura elegantissima</i> (rosy morph)	6.23	1	13	13/94	Y
<i>Obelia</i> sp.	4.50	1	11	4/94	N	
Platform Harvest:						
Leg B1 - 94 images	<i>Metridium senile</i>	23.65	1	48	79/94	Y
	<i>Metridium farcimen</i>	22.67	5	50	3/94	Y
	<i>Pisaster</i> sp.	20.00	20	20	1/94	N
	Turf	19.75	1	49	77/94	Y
	<i>Corynactis californica</i>	16.00	1	48	5/94	Y
	<i>Mytilus</i> spp.	12.50	1	25	18/94	Y
	Porifera	7.47	1	34	43/94	Y
	Red Algae	5.82	1	11	17/94	Y
	Macroalgae	5.00	2	8	2/94	N
	<i>Anthopleura elegantissima</i> (rosy morph)	4.91	1	11	11/94	Y
	Bryozoa erect	4.00	4	4	1/94	Y
	Encruster	3.84	1	14	25/94	Y
Leg B2 - 90 images	Turf	17.81	1	43	81/90	Y
	<i>Metridium senile</i>	17.09	1	38	76/90	Y
	<i>Mytilus</i> spp.	11.67	2	22	21/90	Y
	Porifera	10.73	1	32	37/90	Y
	<i>Corynactis californica</i>	8.33	1	21	6/90	Y
	Red Algae	7.67	1	19	9/90	Y
	Encruster	7.63	1	32	54/90	Y
	Porifera, erect	7.00	7	7	1/90	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	6.80	1	15	15/90	Y
	<i>Ophiothrix spiculata</i>	6.47	1	19	15/90	Y
	<i>Obelia</i> sp.	5.50	3	8	2/90	N
	<i>Galathea californiensis</i>	3.33	1	6	3/90	N

Table 3-14. Dominant taxa on the six platforms as determined by PointCount'99® analysis (continued).

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Platform Hidalgo:						
Leg A1 - 64 images	<i>Metridium senile</i>	23.85	1	47	60/64	Y
	<i>Mytilus</i> spp.	18.23	4	31	13/64	Y
	Turf	13.57	1	30	37/64	Y
	<i>Metridium farcimen</i>	10.33	4	21	3/64	Y
	Porifera	8.76	1	32	46/64	Y
	Porifera, erect	7.50	5	10	2/64	Y
	<i>Corynactis californica</i>	6.40	2	17	5/64	Y
	<i>Ophiothrix spiculata</i>	5.09	1	21	33/64	Y
	<i>Pisaster</i> sp.	5.00	2	8	4/64	Y
	Encruster	4.57	1	26	35/64	Y
	Red Algae	4.50	3	6	2/64	Y
	Fan Worm	2.50	1	4	2/64	N
Leg B1 - 84 images	<i>Anthopleura elegantissima</i> (rosy morph)	28.50	2	45	8/84	Y
	<i>Mytilus</i> spp.	22.83	3	36	23/84	Y
	<i>Metridium senile</i>	19.82	1	47	66/84	Y
	Turf	18.40	1	50	65/84	Y
	<i>Metridium farcimen</i>	8.50	5	12	2/84	Y
	Porifera	7.93	1	23	44/84	Y
	<i>Ophiothrix spiculata</i>	6.11	1	19	28/84	Y
	Encruster	5.97	1	32	38/84	Y
	Porifera, erect	5.50	1	10	2/84	N
	<i>Cancer</i> sp.	5.00	5	5	1/84	N
	<i>Florometra serratissima</i>	5.00	5	5	1/84	N
	<i>Pisaster</i> sp.	4.50	1	7	4/84	Y
Platform Habitat:						
Leg A1 - 75 images	<i>Corynactis californica</i>	37.05	2	50	37/75	Y
	Zoanthidea	29.67	2	50	6/75	Y
	<i>Metridium farcimen</i>	27.55	1	50	11/75	Y
	<i>Mytilus</i> spp.	15.29	1	35	21/75	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	15.07	5	49	14/75	Y
	<i>Metridium senile</i>	11.44	1	39	27/75	Y
	Turf	7.90	1	47	60/75	Y
	Red Algae	6.81	1	24	21/75	Y
	Rockfish	4.00	1	7	2/75	N
	<i>Ophiothrix spiculata</i>	3.83	1	12	18/75	Y
	<i>Coenocyathus bowersi</i>	3.36	1	9	11/75	N
	<i>Paracyathus stearnsii</i>	3.33	1	8	9/75	Y

Table 3-14. Dominant taxa on the six platforms as determined by PointCount'99® analysis (continued).

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Platform Irene:						
Leg A1 - 67 images	<i>Metridium senile</i>	28.69	2	50	59/67	Y
	<i>Metridium farcimen</i>	21.00	21	21	1/67	Y
	<i>Mytilus</i> spp.	14.83	1	28	40/67	Y
	Porifera	9.03	1	24	31/67	Y
	Turf	7.33	1	27	48/67	Y
	Red Algae	5.91	1	24	11/67	Y
	<i>Balanus</i> spp.	5.12	1	14	17/67	Y
	Green Algae	4.00	4	4	1/67	Y
	<i>Pollicipes polymerus</i>	3.50	1	6	2/67	Y
	<i>Pisaster</i> sp.	3.11	1	6	9/67	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	2.50	1	4	6/67	Y
	<i>Cancer</i> sp.	2.25	1	3	4/67	Y

3.6 Statistical Analysis of Photographic Data

Photographic data (i.e., density and percent cover data sets from the whole slide analysis for all platform legs and Diablo and Nifty Rocks; PointCount'99® data for all platform legs) were analyzed using clustering analysis. Samples (i.e., photographs) were classified into separate zones based on the biotic zonation evident at each platform, as determined by inspection videotape analysis. Platform zonation patterns were previously depicted in **Figures 3-1** through **3-3**.

For the six platforms sampled, biotic zones extended from the intertidal zone to the base of the platform. Platform biotic zones have been restated in **Table 3-15**, along with zone depths and unique zone codes as applied in the statistical analyses. For example, the intertidal zone on Leg A1 of Platform Gail was assigned the code GA-A1-6; the same biotic zone on Leg B1 of Platform Gail had the code GA-B1-6.

All taxa present on a platform leg were also combined to allow for leg to leg comparisons. This combination of taxa from different zones on the same platform leg was based on a weighted mean, with weighting based on the relative contribution of a zone on a particular leg. In this analysis, only platform and leg codes were used. For example, the data set containing taxa from Platform Gail, Legs A1 and B1 had the codes GA-A1 and GA-B1, respectively.

3.6.1 Whole Slide Analysis Photographic Data

The first clustering analysis using whole slide data determined the similarities between platform legs, with separate analyses using density (i.e., count) and percent cover data. By combining all data from a single platform leg (i.e., eliminating biotic zones) into a single data set, 10 data sets in total were created. **Figure 3-15** shows the clustering results for count data, by platform leg. The greatest similarity, at approximately 80 percent, was evident between (1) adjacent legs on Platform Harvest (HA-B1 and HA-B2); (2) adjacent legs on Platform Hidalgo (HI-A1 and HI-B1); and (3) Platform Gail, Leg A1 and Platform Grace, Leg C4. Similarity between adjacent legs on the same platform might be expected, however, the high level of similarity between Grace and Gail was unexpected and presents an interesting scenario. Both of these latter platforms are located in the eastern Santa Barbara Channel, within several miles of one another. However, Gail is located in considerably deeper water and exhibited six biotic zones whereas Grace is located in shallower water and showed only five biotic zones.

At the next similarity level, at approximately 60 percent, Platform Habitat, Leg A1 exhibited an affinity with the Platform Gail, Leg A1-Platform Grace, Leg C4 grouping. At the 50 percent similarity, this three-platform grouping showed affinity with Platform Grace, Leg C1. At the other end of **Figure 3-15**, the Harvest and Habitat groups showed similarity to one another at approximately 45 percent, then coupled with Platform Gail, Leg B1, and finally with Platform Irene, Leg A1. At the lowest similarity level, the Grace-Gail (Leg A1)-Habitat group was separate from the Harvest-Hidalgo-Irene-Gail (Leg B1) group.

Table 3-15. Designations of zones used in the clustering analysis of photographic data.

Biotic Zone	Zone Depth (m [ft] subsurface)	Site Code	Leg Code	Zone Code
Platform Gail --				
Intertidal	0 to 1.8 (0 to 6)	GA	A1 and B1	6
<i>Mytilus</i>	1.8 to 12.1 (6 to 40)			7
Barnacle/Scallop	12.1 to 48.8 (40 to 160)			8
<i>Corynactis</i> /Encruster	48.4 to 115.8 (160 to 380)			9
Vase sponge/ Encruster	115.8 to 192.0 (380 to 630)			10
Encruster/Sea Star/ Cup Coral	192.0 to 225.2 (630 to 739)			11
Platform Grace --				
Intertidal	0 to 1.8 (0 to 6)	GR	C1 and C4	1
<i>Mytilus</i>	1.8 to 13.7 (6 to 45)			2
Barnacle/Scallop	13.7 to 27.4 (45 to 90)			3
Anemone/Encruster	27.4 to 70.1 (90 to 230)			4
Encruster/Sea Star	70.1 to 96.9 (230 to 318)			5
Platform Harvest --				
Intertidal	0 to 1.8 (0 to 6)	HA	B1 and B2	17
<i>Mytilus</i>	1.8 to 25.9 (6 to 85)			18
Barnacle/ <i>Corynactis</i>	25.9 to 50.3 (85 to 165)			19
Anemone/Encruster	50.3 to 105.2 (165 to 345)			20
Vase Sponge/ Encruster	105.2 to 169.2 (345 to 555)			21
<i>Metridium</i> /Sea Star	169.2 to 205.7 (555 to 675)			22
Platform Hidalgo --				
Intertidal	0 to 1.8 (0 to 6)	HI	A1 and B1	12
<i>Mytilus</i>	1.8 to 19.8 (6 to 65)			13
Barnacle	19.8 to 32.0 (65 to 105)			14
<i>Metridium</i> /Encruster	32.0 to 109.7 (105 to 360)			15
Sponges/Encruster	109.7 to 132.3 (360 to 434)			16
Platform Habitat --				
Intertidal	0 to 1.8 (0 to 6)	HH	A1	23
<i>Mytilus</i>	1.8 to 18.3 (6 to 60)			24
<i>Corynactis</i>	18.3 to 54.9 (60 to 180)			25
<i>Metridium</i> /Encruster	54.9 to 88.4 (180 to 290)			26
Platform Irene --				
Intertidal	0 to 1.8 (0 to 6)	IR	A1	27
Barnacle/Algae	1.8 to 10.7 (6 to 35)			28
<i>Mytilus</i>	10.7 to 25.9 (35 to 85)			29
<i>Corynactis</i> /Encruster	25.9 to 73.4 (85 to 242)			30

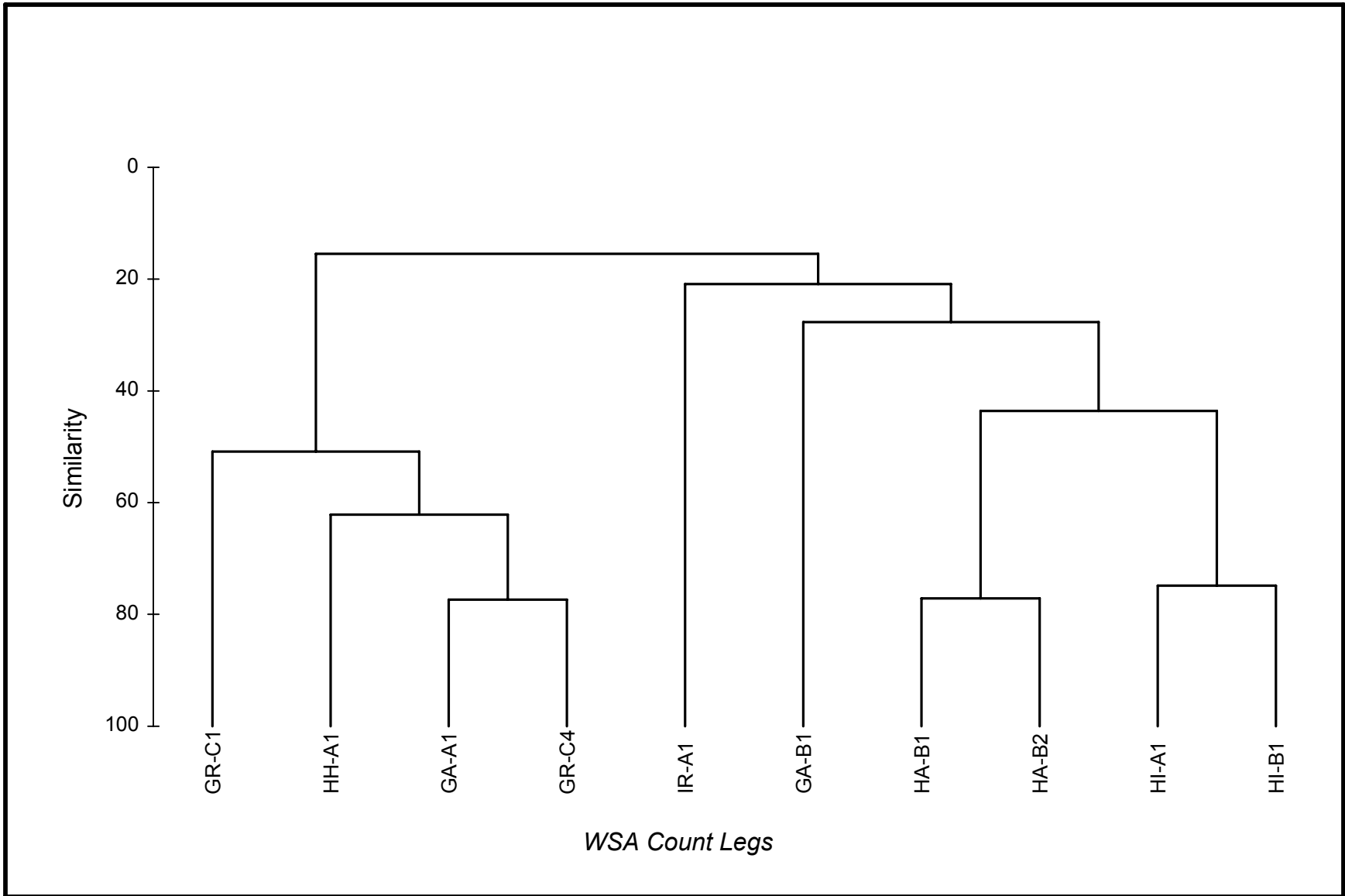


Figure 3-15. Dendrogram of count data from the quantitative slide analysis, by platform leg.

Figure 3-16 shows the clustering results for percent cover data, by platform leg. The greatest similarity was evident between (1) adjacent legs on Platform Harvest (HA-B1 and HA-B2) at >80 percent similarity; (2) adjacent legs on Platform Hidalgo (HI-A1 and HI-B1) at >60 percent similarity; (3) adjacent legs on Platform Gail (GA-A1 and GA-B1) at 60 percent similarity; and (4) adjacent legs on Platform Grace (GR-C1 and GR-C4) at approximately 60 percent similarity. Platform Habitat (HH-A1) subsequently grouped with Grace, while Irene (IR-A1) grouped with the Hidalgo-Gail-Harvest grouping.

The results of the clustering analysis for platform legs appeared to be most consistent with the percent cover data, where adjacent legs of the primary platforms showed a relatively high similarity with one another. For example, the grouping of adjacent legs at Platform Harvest and the grouping of adjacent legs at Platform Hidalgo were both evident in the count and percent cover comparisons (**Figures 3-15** and **3-16**). The Platform Gail grouping evident in percent cover was not present in the count comparisons. Results of clustering using the count data were more convoluted, with two platforms showing adjacent leg similarities and confounding results otherwise. No readily discernable trends (e.g., north-south; shallow-deep platforms) were evident beyond the similarity shown between adjacent platform legs.

The second clustering of whole slide data determined the similarities between biotic zones, with separate analyses using density (i.e., count) and percent cover data. By maintaining separate biotic zones, 52 total data sets were created. Biotic zones were based on the zonation patterns identified during inspection videotape analysis.

Figure 3-17 shows the clustering results for count data, by biotic zone. Greatest similarities (>90 percent) were evident for (1) Platform Irene, Leg A1, *Mytilus* and *Corynactis* zones; (2) Platform Harvest, Legs B1 and B2, *Metridium*/sea star zones; and (3) Platform Hidalgo, Leg B1, intertidal and *Mytilus* zones. Unexpectedly high similarities were noted for (1) Platform Gail, Leg A1, barnacle/scallop and Platform Habitat, Leg A1, *Corynactis* zones; and (2) Platform Grace, Leg C4, encruster/sea star and Platform Harvest, Leg B1, vase sponge/encruster zones.

Analysis of the dendrograms in **Figure 3-17** from lowest to highest similarity (i.e., top down) resulted in the identification of three groupings which generally reflected community water depth. Group A, comprised of 18 data sets, consisted exclusively of intertidal and *Mytilus* communities of platforms Gail, Grace, Harvest, Hidalgo, and Habitat, with small contributions from barnacle/scallop and *Corynactis* assemblages from Platform Gail. The lone outlier from Group A was the two-zone grouping of the intertidal assemblages at Platform Irene. Group B, comprised of 25 data sets, consisted exclusively of *Metridium*/sea star, *Metridium*/encruster, anemone/encruster, and vase sponge/encruster zones of platforms Gail, Harvest, Hidalgo, and Habitat, plus several contributions from the barnacle zone of Platform Hidalgo. The last group, Group C, was comprised of nine data sets and consisted of barnacle/scallop, *Corynactis*/encruster, encruster/sea star, and anemone/encruster zones from platforms Gail, Grace, and Habitat.

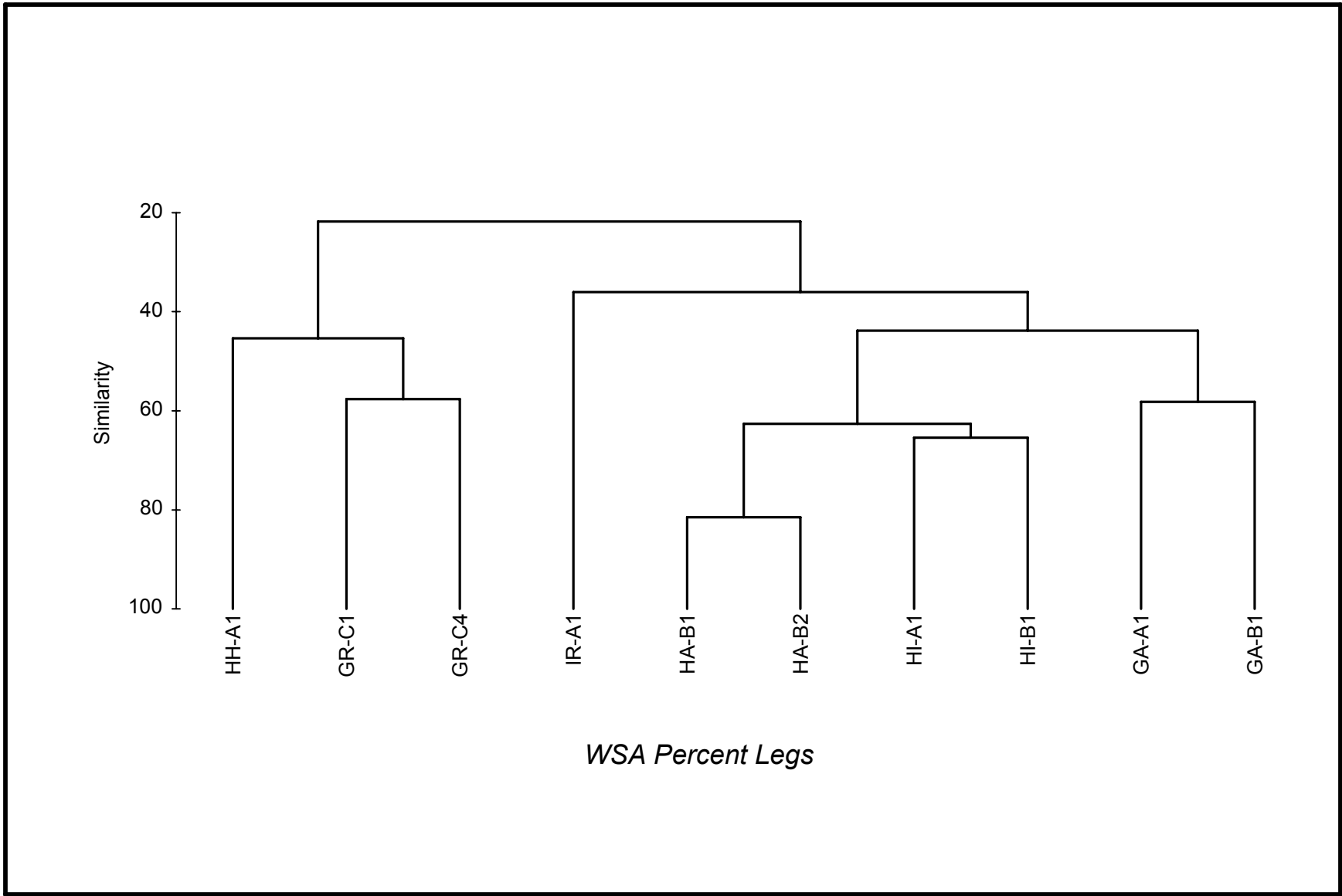


Figure 3-16. Dendrogram of percent cover data from the quantitative slide analysis, by platform leg.

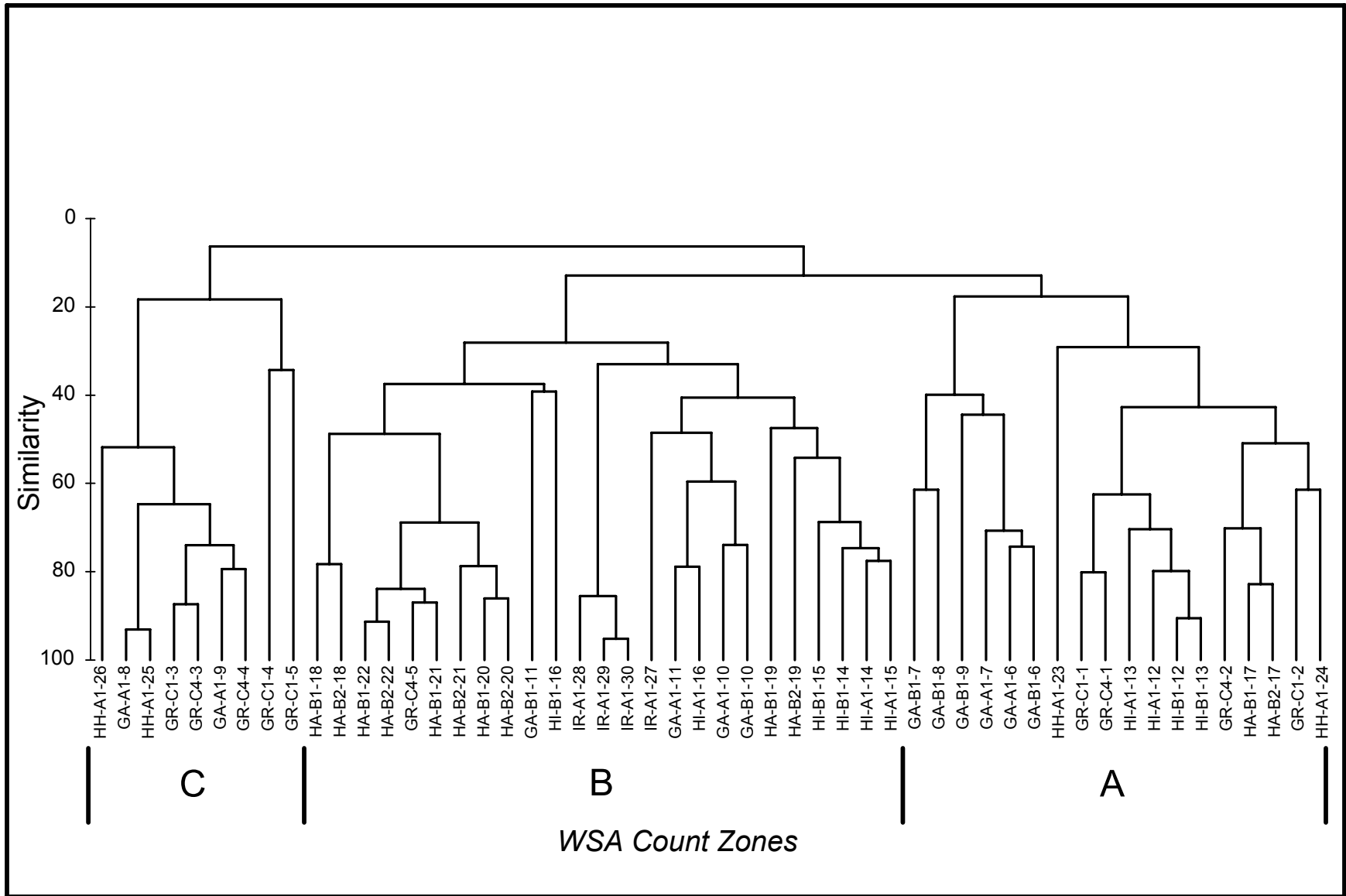


Figure 3-17. Dendrogram of count data from the quantitative slide analysis, by biotic zone for all platforms.

Figure 3-18 shows the clustering results for percent cover data, by biotic zone. While similarity levels were not as high as noted with the count data, greatest similarities were evident between adjacent zones of the same platform leg or the same zones between adjacent legs. In general, with minor exception, similarity groupings (based on count or percent cover biotic zone data resulting from whole slide analysis) tended to occur between adjacent zones of the same platform leg (e.g., intertidal and *Mytilus*) or the same zones between adjacent legs.

A top down analysis of the dendrograms in **Figure 3-18** resulted in the identification of four groupings. Group A, comprised of seven data sets, consisted of intertidal and *Mytilus* communities from platforms Gail and Habitat. Group B, comprised of 15 data sets, consisted of intertidal and *Mytilus* communities from platforms Grace, Harvest, and Hidalgo, with small, anomalous contributions from sponge/encruster and encruster/sea star zones of platforms Hidalgo and Grace. Group C, comprised of 22 data sets, consisted barnacle, barnacle/*Corynactis*, barnacle/algae, *Corynactis*/encruster, *Metridium*/sea star, and *Metridium*/encruster communities from platforms Gail, Harvest, and Hidalgo, with minor contributions from vase sponge/encruster and vase sponge/sea star/cup coral assemblages from platforms Harvest and Gail, respectively. Group D, comprised of seven data sets, consisted of barnacle/scallop and anemone/encruster communities from platforms Grace and Gail, with minor contribution from *Corynactis* and *Metridium*/encruster assemblages from Platform Habitat. One lone outlier, the intertidal zone from Platform Irene, was not grouped with any of the communities noted above.

3.6.2 PointCount'99® Photographic Data

The first clustering of PointCount'99® data determined the similarities between platform legs. As was the case with the whole slide data, combining all data from a single platform leg (i.e., eliminating biotic zones) resulted in the creation of 10 PointCount'99® data sets.

Figure 3-19 shows the clustering results for PointCount'99® data, by platform leg. The greatest similarity, at approximately 80 to 85 percent, was evident between (1) adjacent legs on Platform Harvest (HA-B1 and HA-B2); and (2) adjacent legs on Platform Hidalgo (HI-A1 and HI-B1). These groupings were identical to those exhibited in the first clustering analysis of whole slide data (i.e., count data set).

The next groupings evident, at 75 percent similarity, were (1) Platform Grace, Leg C4 and Platform Habitat, Leg A1; and (2) the Platform Harvest (Legs B1 and B2) and Platform Hidalgo (Legs A1 and B1) groupings noted previously. The Harvest-Hidalgo grouping was also evident in the first clustering analysis of whole slide data, while the Grace-Hidalgo grouping was not reflected in the earlier clustering analysis. The Harvest-Hidalgo grouping suggests a strong similarity between these two southern Santa Maria Basin platforms. No other groupings suggest a geographic-based similarity. For example, the Harvest-Hidalgo grouping was most similar to Platform Gail (Leg A1), from the eastern Santa Barbara Channel, and Platform Irene (Leg A1), in the southern Santa Maria Basin.

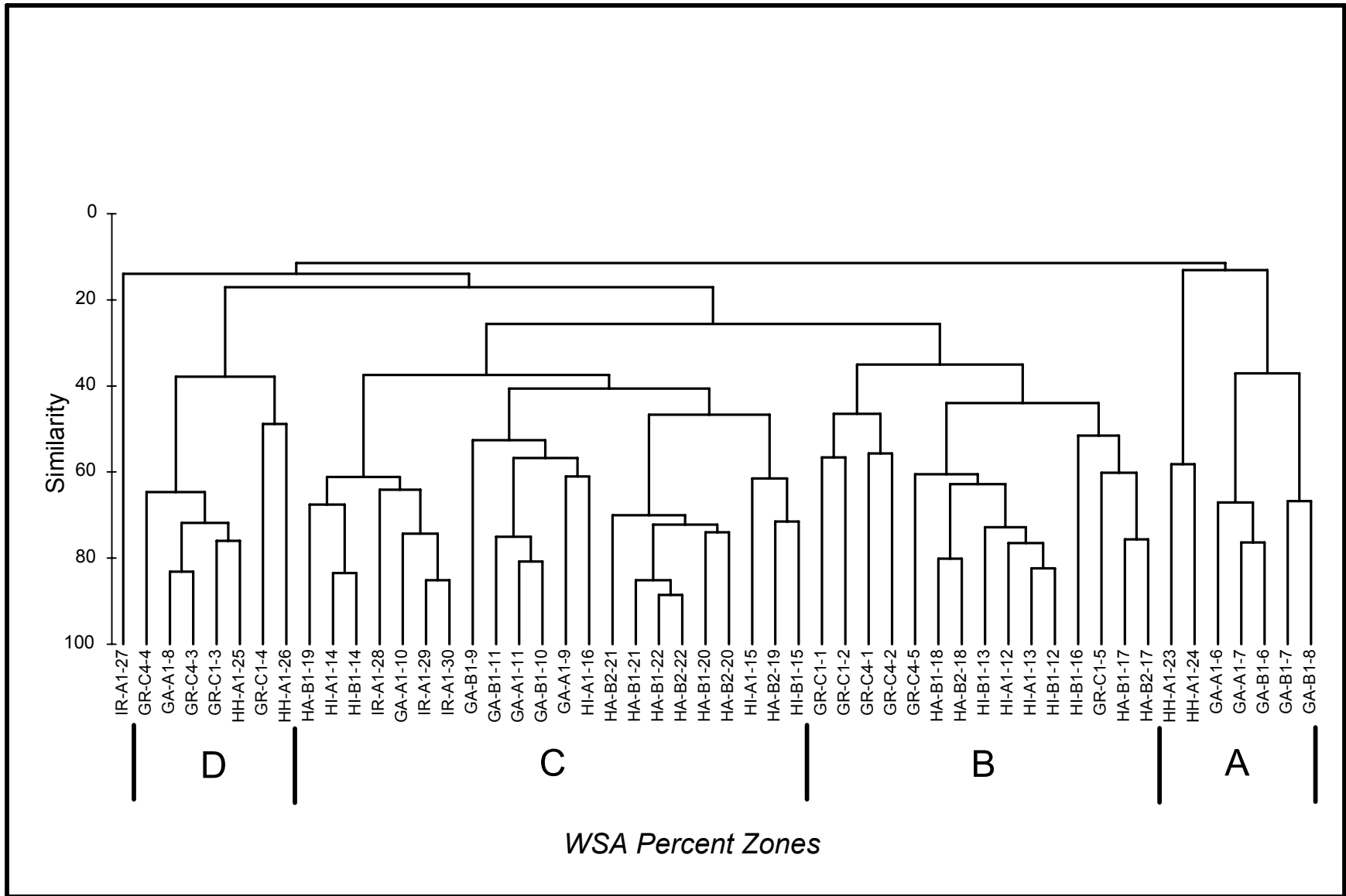


Figure 3-18. Dendrogram of percent cover data from the quantitative slide analysis, by biotic zone for all platforms.

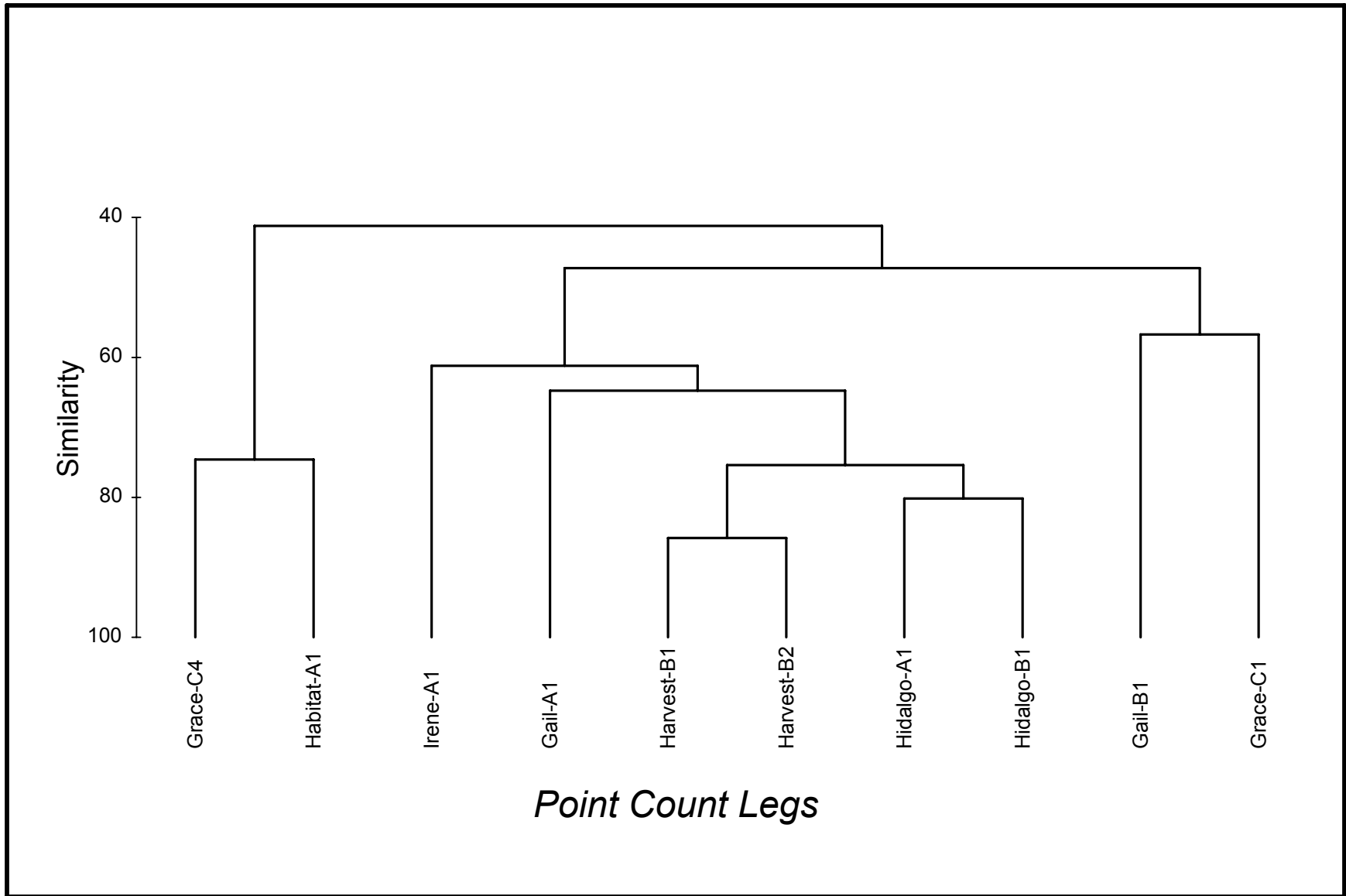


Figure 3-19. Dendrogram of PointCount data, by platform leg.

The second clustering of PointCount'99® data determined the similarities between biotic zones. By maintaining separate biotic zones, 52 total data sets were created. **Figure 3-20** shows the clustering results for PointCount'99® data, by biotic zone. Greatest similarities (>90 percent) were evident for (1) Platform Irene, Leg A1, *Mytilus* and *Corynactis* zones; (2) Platform Gail, Leg A1, barnacle/scallop and Platform Grace, Leg C4, barnacle/scallop zones; (3) Platform Harvest, Leg B2, anemone/encruster and Platform Hidalgo, Leg A1, sponges/encruster zones; and (4) Platform Hidalgo, Legs A1 and B1, intertidal zones. The Irene *Mytilus* and *Corynactis* grouping was also evident in the first clustering of whole slide data, however, the remaining groupings were not evident in the earlier clustering analysis. Strongest similarities were evident between similar zones (e.g., intertidal, *Metridium*/encruster), regardless of platform geographic location or water depth.

A top down analysis of the dendrograms in **Figure 3-20** resulted in the identification of four groupings. Group A, comprised of 14 data sets, consisted of intertidal and *Mytilus* communities from platforms Gail, Grace, Harvest, Hidalgo, Habitat, and Irene. Group B, comprised of 14 data sets, consisted of (1) *Corynactis*/encruster, encruster/sea star/cup coral, and vase sponge/encruster communities of Platform Gail; (2) *Mytilus* and encruster/sea star communities of Platform Grace; anemone/encruster, vase sponge/encruster, and *Metridium*/sea star communities of Platform Harvest; and (3) sponges/encruster communities of Platform Hidalgo. Group C, comprised of 14 data sets, consisted of (1) *Mytilus*, barnacle/*Corynactis*, and *Metridium*/sea star communities of Platform Harvest; (2) *Mytilus*, barnacle, and *Metridium*/encruster communities of Platform Hidalgo; and (3) barnacle/algae, *Mytilus*, and *Corynactis*/encruster communities of Platform Irene. Group D, comprised of 10 data sets, consisted of (1) intertidal, *Mytilus*, barnacle/scallop, and vase sponge/encruster communities of Platform Gail; (2) barnacle/scallop and anemone/encruster communities of Platform Grace; and (3) *Corynactis* and *Metridium*/encruster communities of Platform Hidalgo.

3.6.3 Diablo and Nifty Rocks and Comparable Platform Zones

The last set of clustering analyses employed whole slide data to determine the similarities between epibiota of natural rock outcrops and platform legs within similar water depths using density (i.e., count) and percent cover data. The 10 whole slide count and percent cover data sets (as described previously in **Section 3.6.1**) were pared down to include only those photographs acquired between 5 and 17 m (15 and 55 ft), the depth range within which photographs had been collected at the natural outcrops. Clustering analyses were then conducted, with separate results generated for counts and percent cover.

Figure 3-21 shows the clustering results for count data, comparing comparable platform biota (in the 5 to 17 m depth range) to natural outcrop communities. The greatest similarity, at approximately 60 percent, was evident between (1) Platform Hidalgo, Leg A1 and Platform Irene, Leg A1; (2) Platform Grace, Leg C1 and Diablo Rock; and (3) Platform Harvest, Legs B1 and B2. At the next similarity level, at approximately 40 percent, three groupings were evident: (1) Nifty Rock with the Hidalgo-Irene group; (2) Hidalgo, Leg B1 with the Harvest B1-B2 group; and (3) Platform Gail, Legs A1 and B1. Results of this analysis indicate that natural outcrop communities have a moderate similarity to select platform communities – Diablo Rock with Platform Grace and Nifty Rock with the Hidalgo-Irene group.

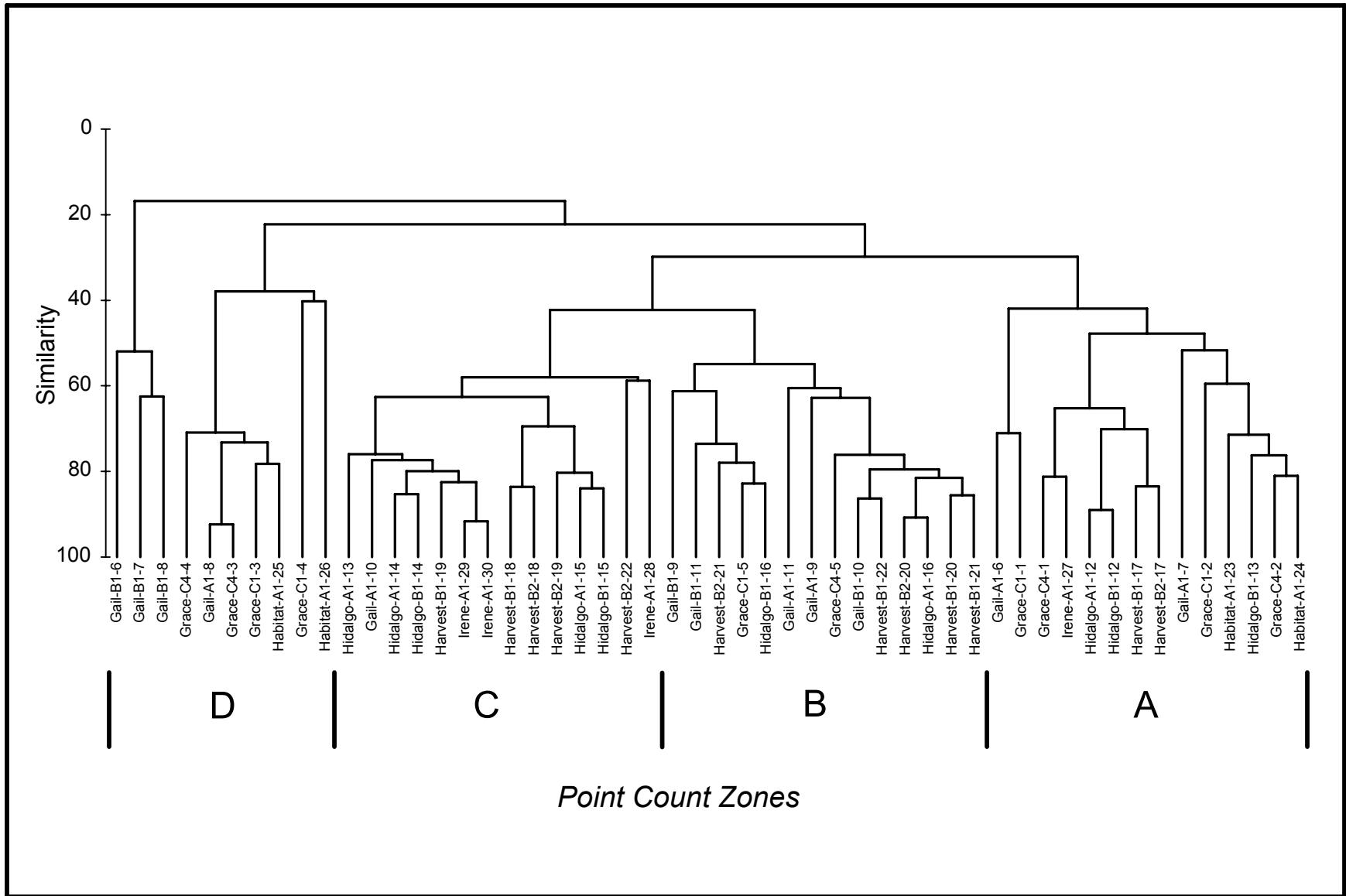


Figure 3-20. Dendrogram of PointCount data, by biotic zone for all platforms.

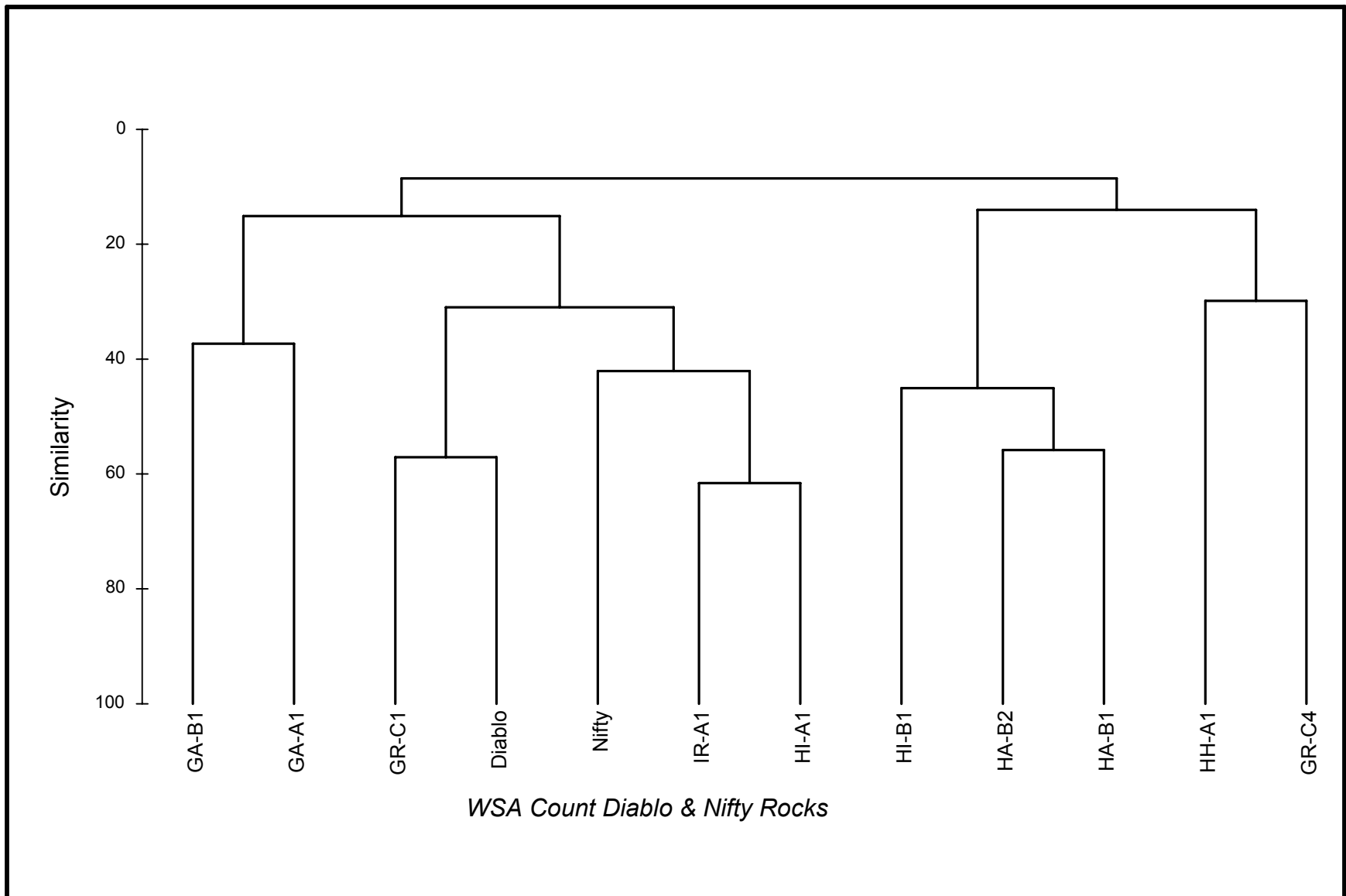


Figure 3-21. Dendrogram of count data from the quantitative slide analysis – platform legs versus natural outcrops.

Figure 3-22 shows the clustering results for percent cover data, comparing comparable platform biotal cover (in the 5 to 17 m depth range) to natural outcrop communities. Greatest similarities were evident for (1) Platform Hidalgo, Leg A1 and Platform Irene, Leg A1; (2) Platform Grace, Leg C4 with the Hidalgo-Irene group; and (3) Platform Harvest, Leg B2 with the Grace-Hidalgo-Irene group. Diablo Rock exhibited closest affinity to the Harvest-Grace-Hidalgo-Irene group, while Nifty Rock showed greatest similarity with Platform Grace, Leg C1. Aside from the Hidalgo-Irene grouping, none of the percent cover similarities were evident in the earlier count data comparisons. No readily discernable trends were evident.

3.7 Scraping Analysis

The scraping analysis encompassed complete taxonomic identification of all species present within each 0.0625 m² quadrat collected from Legs B1 and B2 of Platform Harvest and Legs A1 and B1 of Platform Gail. A total of 23 scraping samples were collected from Harvest and 31 scraping samples from Gail.

On Platform Harvest, the depth of collection ranged from 3.4 to 24.1 m (11 to 79 ft), with samples acquired from the mussel and upper barnacle zones. A total of 12 scraping samples were acquired from Harvest Leg B1, including four barnacle zone samples and eight *Mytilus* zone samples. A total of 11 scraping samples were collected from Harvest Leg B2, including three barnacle zone samples and eight *Mytilus* zone samples.

On Platform Gail, the depth of collection ranged from 0.3 to 24.1 m (1 to 79 ft), with sampling in the intertidal, barnacle/scallop, and *Mytilus* zones. A total of 17 scraping samples were acquired from Gail Leg A1, including five intertidal zone samples, six barnacle/scallop zone samples, and six *Mytilus* zone samples. A total of 14 scraping samples were collected from Gail Leg B1, including three intertidal zone samples, two barnacle/scallop zone samples, and nine *Mytilus* zone samples.

Species identification was completed for all species present in scraping samples from both platforms, from the larger megaepifauna to the cryptic interstitial biota beyond the view of 35-mm photographic equipment (i.e., diver and ROV photography). Some overlap was expected between species identified in the photographs and those identified from scrapings, noting that scraping sample collections were restricted to diving depths, from within the intertidal, barnacle or barnacle/scallop, and *Mytilus* zones. For example, *Ophiothrix spiculata* and *Ophiopterus papillosa* were the only two ophiuroid species identified during scraping analysis from Platform Harvest. During the photographic analysis, specimen size, photographic resolution, and lack of specimens resulted in the classification of unidentified ophiuroids in many of the photographs. Scraping analysis results allowed for a complete species-level determination; ophiuroids present in photographs from Platform Harvest were considered to be *Ophiothrix spiculata*, among the dominant taxa at all platforms. Scraping material acquired from Platform Harvest was also weighed and measured, providing the basis for wet weight and length-width-height determinations (see **Section 3.9**).

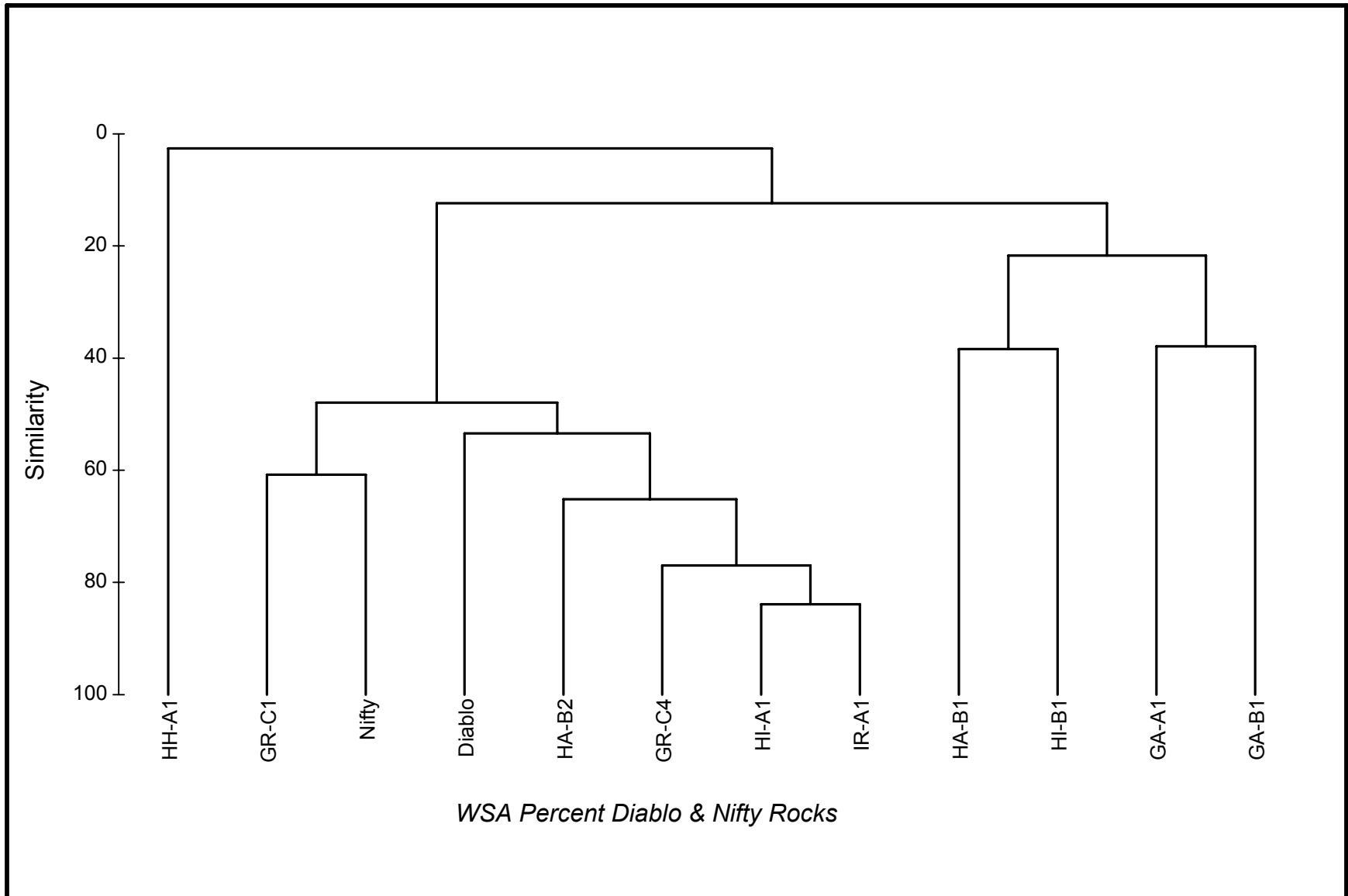


Figure 3-22. Dendrogram of percent cover data from the quantitative slide analysis – platform legs versus natural outcrops.

The species identified at each discrete scraping location on both platforms (i.e., leg designation, water depth) are outlined in detail in **Appendix D. Tables 3-16** and **3-17** list the most common taxa identified from the scraping analysis (i.e., taxa that occurred in a quarter or more of the scraping samples). Due to extremely high numbers of individuals and the presence of colonial species, the completion of total counts (i.e., total numbers of individuals) was not practical and a qualitative determination of species presence was made. Qualitative estimates were categorized as abundant, moderately abundant, and limited or sparse (see **Tables 3-16** and **3-17**, and **Appendix D**).

At Platform Harvest, a total of 130 taxa were identified, the majority of which were identified to species level. Dominant taxa were identified based on their frequency of occurrence and their mean relative abundance. Dominant taxa in scrapings from Platform Harvest, based on mean relative abundance, included *Ophiothrix spiculata*, *Rhodymenia californica*, *Mytilus* spp., *Membranoptera multiramosa*, *Caprella alaskana*, *Megabalanus californicus*, *Mytilus californianus*, *Halosydna brevisetosa*, *Elasmopus* cf. *holgurus*, and *Metridium senile*. The presence of these dominant taxa in either the *Balanus* or *Mytilus* zones, or both, is readily visible in **Table 3-16**.

Several species, including *Ophiothrix spiculata*, *Caprella alaskana*, *Elasmopus* cf. *holgurus*, *Pycnogonum stearnsi*, and *Hiatella arctica*, were present in all 23 scraping samples. Other species, such as *Rhodymenia californica*, *Mytilus* spp., *Membranoptera multiramosa*, *Megabalanus californicus*, and *Halosydna brevisetosa*, were very abundant when they occurred, but were not always present (**Table 3-16**).

At Platform Gail, a total of 90 taxa were identified, the majority of which were identified to species level. Dominant taxa in scrapings from Platform Gail (based on frequency of occurrence and mean relative abundance) included *Pterosiphonia dendroidea*, *Anthopleura elegantissima*, *Metridium senile*, *Spirobranchus spinosus*, *Ophiothrix spiculata*, *Elasmopus holgurus*, *Diadumene cincta*, *Balanus trigonus*, and *Metridium exilis*. As was noted for Platform Harvest, the presence of these dominant taxa in either the barnacle/scallop, intertidal, or *Mytilus* zones of Platform Gail is readily apparent in **Table 3-17**. Several species, including *Elasmopus holgurus* and *Balanus trigonus*, were present in all 31 scraping samples. Other species, such as *Ophiothrix spiculata*, *Pterosiphonia dendroidea*, *Metridium exilis*, *Chama arcana*, and *Spirobranchus spinosus*, were very abundant when present, but were not consistently present in all scraping samples. *Mytilus* spp., which was sparse on Leg A1, was a dominant species on Leg B1 (**Table 3-17**).

3.8 Statistical Analysis of Scraping Data

Results of the analysis of scraping samples from Legs B1 and B2 of Platform Harvest were analyzed with correspondence analysis. As was the case with the photographic data, taxa for the analysis were selected in consultation with the taxonomists who oversaw the analysis. Taxa that were thought to be uniquely identified were retained in the statistical analysis. Samples were classified into either a *Mytilus* zone or a barnacle zone. A phylogenetic listing of the taxa included in the analysis is presented in **Table 3-18**. The data matrix for the analysis was the occurrence of a taxon in a particular scraping sample (i.e., presence/absence).

Table 3-16. Summary of the most common taxa identified, their relative abundance, frequency of occurrence, and mean relative abundance per occurrence, as determined from scraping samples collected at Platform Harvest.

Taxon	Relative Abundance																				Frequency of Occurrence	Mean					
	Leg B1 Zone										Leg B2 Zone																
	Balanus					Mytilus					Balanus					Mytilus											
<i>Ophiothrix spiculata</i>	1	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	100.0	1.13			
<i>Rhodymenia californica</i>		2			1	2	2	1		1	1	1	1		1			1		1			52.2	1.25			
<i>Mytilus</i> spp.							2	1															8.7	1.50			
<i>Membranoptera multiramosa</i>	1					2	2						1			2							21.7	1.60			
<i>Caprella alaskana</i>	2	2	3	2	1	1	2	2	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	100.0	1.61
<i>Megabalanus californicus</i>		3		3	2	1	1	1	2	3	1	1	3	3	2	1	1	2	1	1	1	1	1	1	1	91.3	1.67
<i>Mytilus californianus</i>					1	3	3	3	3		2	3	3	3	3	1	1	1	1	1	1	1	1	1	1	78.3	1.94
<i>Halosydna brevisetosa</i>	3		2		2	2	2	2	2		1	3	3	2	3	1	1	2	1	1	1			3	82.6	1.95	
<i>Elasmopus</i> cf. <i>holgurus</i>	2	1	2	1	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	3	100.0	2.00
<i>Metridium senile</i>	1	1	1	1	1	2	3	3	3	2	2	2	3	2	3	1	2	1	1	3	3	3			95.7	2.00	
<i>Pugetia fragillissima</i>		2															2								8.7	2.00	
<i>Rhodymenia pacifica</i>							2												2						8.7	2.00	
<i>Anthopleura elegantissima</i>																2									4.3	2.00	
<i>Phyllochaetopterus prolifica</i>		3	1	1	3	2	3	2	1	1	2	3	2	3	1	3		3	2		3		3	3	82.6	2.21	
<i>Syllis gracilis</i>	3	3	1	1	3	2	2	3	3	3	1	1	1	2	1	3		3	3		3		3	3	87.7	2.25	
<i>Jassa slatteryi</i>		3	2	2	2	2	2	2	3	3	2	2	2	2	2	2	2	2	2	3	3	3			91.3	2.29	
<i>Maera simile</i>	2	2	2	2	3	2	2	2	3	3	3	2	2	2	2	2	2	2	2	3	3		3	3	95.7	2.32	
<i>Pycnogonum stearnsi</i>	2	3	3	3	2	2	2	2	3	2	3	2	2	3	2	3	2	2	2	2	2	2	3	3	100.0	2.39	
<i>Celleporina</i> spp.		2								3															8.7	2.50	
<i>Typosyllis</i> spp.			3	3	3				3						3	1	3	3	2	3	1		3	3	52.2	2.58	
<i>Caprella equilibra</i>				3		2										3						2		3	21.7	2.60	
<i>Cirratulus</i> , unidentified			2											3					3						13.0	2.67	
<i>Corynactis californica</i>		2															3				3				13.0	2.67	
<i>Tetraclita rubescens</i>																2	3	3							13.0	2.67	
Porifera sp. A	1	1	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	3			95.7	2.68	
<i>Caprella verrucosa</i>				3	2		3	2	3	2	2	3	3			3	3	2	3	3		3	3		69.6	2.69	
<i>Balanus nubilus</i>	3	3	3			2	3	3	3	3	3	3	3	2	2	2	3	3	2		3		3		82.6	2.74	
<i>Polydora</i> spp.				3					3						3	2									17.4	2.75	

Table 3-16. Summary of the most common taxa identified, their relative abundance, frequency of occurrence, and mean relative abundance per occurrence, as determined from scraping samples collected at Platform Harvest (continued).

Taxon	Relative Abundance																				Frequency of Occurrence	Mean		
	Leg B1 Zone										Leg B2 Zone													
	Balanus					Mytilus					Balanus					Mytilus								
<i>Podocerus brasiliensis</i>		3	3	2	3	3		2	3	3	3	3	3	2	3	3	2	3				3	78.3	2.78
<i>Stenothoe estacola</i>		3	3	3	3	2	3	3		3		3		3	3	2	2	2	3	3	3	3	82.6	2.79
<i>Hiatella arctica</i>	3	3	3	3	3	1	3	3	3	3	3	3	3	3	3	1	3	3	3	3	3	3	100.0	2.83
<i>Erichthonius brasiliensis</i>	3	3	3	2										3	3								26.1	2.83
<i>Anthopleura elegantissima</i> (rosy morph)											2					3	3	3	3	3		3	30.4	2.86
<i>Pododesmus cepio</i>	3	3	2	3	2	3		3	3		3	3	3	3	3				3			3	65.2	2.87
<i>Pseudochama exogyra</i>	3			2	2	3		3	3	3	3	3	3	3	3		3		3	3		3	73.9	2.88
<i>Obelia geniculata</i>			2	2	3	3	3	3	3	3	3	3	3	3			3	3		3			69.6	2.88
<i>Halosydna johnsoni</i>			2	3				3						3	3		3	3	3	3			39.1	2.89
<i>Filicrisia</i> spp.	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	95.7	2.91
<i>Balanus trigonus</i>		3		3		2	3						3	3		3	3		3	3		3	47.8	2.91
<i>Phyllodoce medipapillata</i>			2	3	3	3	3	3	3		3					3		3	3				47.8	2.91
<i>Phascolosoma agassizi</i>			2	3		3			3	3	3			3	3	3		3	3	3	3		56.5	2.92

Key: 1 = abundant; 2 = moderately abundant; 3 = limited, sparse

Note: Twenty-three (23) scraping samples collected from Platform Harvest. Frequency of occurrence based on presence in 23 scraping samples.

Table 3-17. Summary of the most common taxa identified, their relative abundance, frequency of occurrence, and mean relative abundance per occurrence, as determined from scraping samples collected at Platform Gail.

Taxon	Relative Abundance																								FO	Mean							
	Leg A1 Zone												Leg B1 Zone																				
	Barnacle/Scallop				Intertidal				Mytilus				B/S	Inter		Mytilus																	
<i>Pterosiphonia dendroidea</i>	1			1	1		1	1	1	1		1	1		1			1			1		1	1	1		1	1	1	61.3	1.00		
<i>Anthopleura elegantissima</i>						1																							3.2	1.00			
<i>Metridium senile</i>		1		1	2	1						1			1	1					1	1		1			1	1		41.9	1.08		
<i>Spirobranchus spinosus</i>			1	1		1	1		1	1	1	1	1	1	1	1	1	1	1	1	3	1	1		1	1			67.7	1.10			
<i>Ophiothrix spiculata</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2		1	1	1	1	1	1	1	2	1	2	96.8	1.10	
<i>Elasmopus holgurus</i>	2	1	1	1	1	1	1	2	2	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	100.0	1.19		
<i>Diadumene cincta</i>																1		1							1			2	12.9	1.25			
<i>Balanus trigonus</i>	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	2	1	1	2	1	1	2	1	2	100.0	1.32
<i>Metridium exilis</i>	1				2		3	1	1	1	2	1	1	2		1	2	1	1	1	1	1	1	1		2	2	2	80.6	1.36			
<i>Tetraclita rubescens</i>							1	2	2	2	2					2				1	1	1							29.0	1.56			
<i>Chama arcana</i>	3	1	2		3		1	2	1	2	2	1	1	1	1	1	1	1	1		1	2		3	1	2	1		3	77.4	1.58		
<i>Ophiactis simplex</i>	2	2				2	2			1		2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	2	1	1	2	1	77.4	1.75
<i>Haplosclerida nr. Haliclona spp.</i>	1	1	1	2	1	2	2		3	1			2	2		2	2	2	2	3			3	2	2	2	2		1	1	1	74.2	1.78
<i>Phyllodoce medipapillata</i>	1	1	2	2		2	2	1	2	2	2	2			2	2		2			2	2		2	2		2		2	64.5	1.85		
<i>Caprella equilibra</i>	1	2			2	1		3				3	2	1	2	2		2	2	2	2	2	2	1	1	2		2	2	1	3	71.0	1.86
<i>Nereis mendocinana</i>	2	2			1		2	2		2			2		2	2	2	2		2		2	2	2	2					51.6	1.94		
<i>Lithophaga plumula</i>	1						2			3	3	3	2	2	2	2	2					3	1	1	2		1	2	1	3	58.1	2.00	
<i>Antithamnion hubbsii</i>	2				2		2	2		2	2		2		2			2							2					32.3	2.00		
<i>Pododesmus cepio</i>	3	1	1		3	1										2					3									22.6	2.00		
<i>Polysiphonia scopulorum var. villosum</i>					2	2		2					2	2										2						19.4	2.00		
<i>Crassadoma gigantea</i>													2																	3.2	2.00		
<i>Obelia nr. surcularis</i>								2																						3.2	2.00		
<i>Strongylocentrotus purpuratus</i>											2																			3.2	2.00		
<i>Hiatella arctica</i>	2				2	3	1		2	1	2	3	2	2	2	2	2					1	1	3	2		2	3	3	64.5	2.05		
<i>Mytilus spp.</i>						3	3	3	1		3		3	3	3	3	3		1	1	1	2	1	2	1	2	1	3	3	1	71.0	2.14	

Table 3-17. Summary of the most common taxa identified, their relative abundance, frequency of occurrence, and mean relative abundance per occurrence, as determined from scraping samples collected at Platform Gail (continued).

Taxon	Relative Abundance																							FO	Mean														
	Leg A1 Zone											Leg B1 Zone																											
	Barnacle/Scallop					Intertidal					Mytilus					B/S		Inter		Mytilus																			
<i>Megabalanus californicus</i>	2	2	3	3	1	2	3	2	2	2	2	3	3	3	3		2			1	1	1	3		3	1	3						74.2	2.22					
<i>Jassa slatteryi</i>		3		3								2		3	2	2					1	2	2	1	2	3		2	3		3	48.4	2.27						
<i>Aplidium spp.</i>	3						3							3					1	1				3		2	2	3	3	1		35.5	2.27						
<i>Gammaropsis thompsoni</i>	2	2	3	3	2	2						2	3	3	2	2			3	2				2	2			3	2	2		58.1	2.33						
<i>Erichthonius brasiliensis</i>				2	3	2								3					2														16.1	2.40					
<i>Leucothoe alata</i>	2	2		2	2	2	3					3	3		3		3	2	3	3	3												67.7	2.48					
<i>Kellia suborbicularis</i>	3											3	3					2		3														38.7	2.50				
<i>Balanus nubilus</i>	2	2		3	3		1							3		3																		29.0	2.56				
<i>Monocorophium spp.</i>	3	2	3	3			3					2	3		3	3																			51.6	2.56			
<i>Halosydna brevisetosa</i>	2	3			3	2			2			3	3		2	2		3		2	3	2	3	3	3	3	2	2	3		3	3		71.0	2.59				
<i>Ostrea conchaphila</i>																			2		3	2	3												16.1	2.60			
<i>Dulichella appendiculata</i>			2	3	3															3																12.9	2.75		
<i>Phascolosoma agassizi</i>																																					41.9	2.77	
<i>Pachygrapsus crassipes</i>							3		3		3		3				3		3		2	2	3			3	3									35.5	2.82		
<i>Parapleustes pugettensis</i>							2															3	3			3	3										19.4	2.83	
<i>Phyllochaetopterus prolifica</i>			3		2	3		3	3	3	3	3					3			3																		48.4	2.93

Key: 1 = abundant; 2 = moderately abundant; 3 = limited, sparse; B/S = barnacle/scallop; Inter = intertidal; FO = frequency of occurrence

Note: Thirty-one (31) scraping samples collected from Platform Gail. Frequency of occurrence based on presence in 31 scraping samples.

Table 3-18. Summary species list for scraping samples used in the correspondence analysis.

Flora:		
Algae:	Crabs, continued:	Bivalves, continued
<i>Membranoptera multiramosa</i>	<i>Paraxanthias taylora</i>	<i>Mytilus californianus</i>
<i>Pugetia fragillissima</i>	<i>Scyra acutifrons</i>	<i>Mytilus</i> spp.
<i>Rhodymenia californica</i>	Sea spiders (Pycnogonida):	<i>Mytilus trossulus/galloprovincialis</i>
<i>Rhodymenia pacifica</i>	<i>Anoplodactylus nodosus</i>	<i>Pododesmus cepio</i>
Fauna:	<i>Pycnogonum stearnsi</i>	<i>Pseudochama exogyra</i>
Crustaceans:	Echinoderms:	Chitons (Polyplacaphores):
Barnacles (Cirripedia):	Brittle Stars (Ophiuroidea):	<i>Mopalia porifera</i>
<i>Balanus nubilus</i>	<i>Ophiopteris papillosa</i>	Polychaetes:
<i>Balanus trigonus</i>	<i>Ophiothrix spiculata</i>	<i>Arabella semimaculata</i>
<i>Megabalanus californicus</i>	Holothuroids (Holothuroidea):	<i>Brania</i> spp.
<i>Tetraclita rubescens</i>	<i>Parastichopus californicus</i>	<i>Cirratulus</i> , unidentified
Caprellid amphipods:	<i>Pentamera lissoplaca</i>	<i>Dodecaceria fewkesi</i>
<i>Caprella alaskana</i>	Mollusks:	<i>Dodecaceria</i> , unidentified
<i>Caprella equilibra</i>	Gastropods (Gastropoda):	<i>Eudistylia polymorpha</i>
<i>Caprella ferrea</i>	<i>Amphissa versicolor</i>	<i>Halosydna brevisetosa</i>
<i>Caprella verrucosa</i>	<i>Anisodoris nobilis</i>	<i>Halosydna johnsoni</i>
Gammarid amphipods:	<i>Iselica ovoidea</i>	<i>Lepidonotus spiculus</i>
<i>Aoroides</i> spp.	<i>Tritonia diomedea</i>	<i>Myxicola</i> spp.
<i>Elasmopus</i> cf. <i>holgurus</i>	Bivalves (Pelecypoda):	<i>Nereis eakini</i>
<i>Erichthonius brasiliensis</i>	<i>Anomia peruviana</i>	<i>Nereis pelagica neonigripes</i>
<i>Janiralata occidentalis</i>	<i>Chama arcana</i>	<i>Paleanotus bellis</i>
<i>Jassa slatteryi</i>	<i>Crassadoma gigantea</i>	<i>Pholoides asperus</i>
<i>Podocerus brasiliensis</i>	<i>Gregariella chenui</i>	<i>Phyllochaetopterus prolifica</i>
<i>Stenothoe estacola</i>	<i>Hiatella arctica</i>	<i>Phyllodoce medipapillata</i>
Crabs (Brachyura, Cancridae):	<i>Irus lamellifer</i>	<i>Polydora</i> spp.
<i>Cancer branneri</i>	<i>Kellia suborbicularis</i>	<i>Proceraea</i> cf. <i>kiiensis</i>
<i>Cancer jordani</i>	<i>Lithophaga plumula</i>	Sabellidae, unidentified
<i>Cancer productus</i>	<i>Modiolus capax</i>	<i>Serpula columbiana</i>
<i>Maera simile</i>	<i>Mya arenaria</i>	<i>Spirobranchus spinosus</i>
<i>Pachycheles pubescens</i>		<i>Syllis gracilis</i>
<i>Pachycheles rudis</i>		<i>Typosyllis</i> spp.

Table 3-18. Summary species list for scraping samples used in the correspondence analysis (continued).

Cnidarians:	Minor Phyla:
Anthozoans (Actiniaria):	Bryozoans (Bryozoa):
<i>Anthopleura elegantissima</i>	<i>Callopora</i> spp.
<i>Anthopleura elegantissima</i> (rosy morph)	<i>Celleporella</i> spp.
<i>Corynactis californica</i>	<i>Celleporina</i> spp.
<i>Metridium senile</i>	<i>Costazia</i> spp.
Hydrozoans:	<i>Crisia</i> spp.
<i>Campanularia</i> spp.	<i>Filicrisia</i> spp.
<i>Eucopeia everta</i>	<i>Scrupocellaria</i> spp.
<i>Filellum serpens</i>	<i>Tegella</i> sp.
<i>Halecium</i> spp.	Flatworms (Platyhelminthes):
<i>Halecium tenellum</i>	<i>Stylochoplana longipenis</i>
<i>Lafoea adnata</i>	<i>Stylochus</i> spp.
<i>Obelia geniculata</i>	Nemertean (Nemertea):
<i>Obelia</i> spp.	<i>Amphiporus</i> spp.
<i>Plumularia alicia</i>	<i>Carinoma mutabilis</i>
<i>Plumularia alicia</i> complex	<i>Paranemertes californica</i>
<i>Plumularia</i> nr. <i>septata</i>	<i>Tetrastemma signifer</i>
<i>Plumularia</i> spp.	Sipunculids (Sipunculida):
<i>Sertularella tenella</i>	<i>Phascolosoma agassizi</i>
<i>Syncoryne eximia</i>	Sponges (Porifera):
	Porifera sp. A
	<i>Rhabdodermella nuttingi</i>
	Tunicates (Urochordata, Ascidiacea):
	<i>Styela coriacea</i>
	<i>Styela truncata</i>

Much of the variability in the data set was not accounted for in the first several correspondence dimensions. The first dimension only explained 12.0 percent of the variability in the data set, and the second dimension only explained 11.2 percent, for a total of 23.2 percent of the total variability in the data set. Despite the low level of explained variability, the first two correspondence dimensions did reveal an interesting trend in the data. A plot of the two zones, *Mytilus* and barnacle, reveals that the two zones were distinct in terms of their respective taxonomic compositions and the taxonomic composition of the *Mytilus* zone was more variable among the scraping samples that was the taxonomic compositions of the barnacle zone samples (Figure 3-23).

Numerous taxa occurred exclusively in the *Mytilus* zone, but only in a few of the scraping samples. *Mytilus californianus* occurred in most of the scraping samples collected in the *Mytilus* zone, but also in a number of samples collected in the barnacle zone, suggesting that a gradual transition exists between these zones. Taxa that occurred exclusively in this zone and more frequently were *Phascolosoma agassizi*, *Halecium* spp., *Callopora* spp., *Anthopleura elegantissima* (rosy morph), *Celleporella* spp., and *Filellum serpens*. The barnacles *Balanus nubilus* and *B. trigonus* occurred frequently but not exclusively in the samples collected in the barnacle zone. Several species occurred exclusively in the barnacle zone: *Aoroides* spp., *Brania* spp., *Cancer branneri*, *Cancer jordani*, *Erichthonius brasiliensis*, *Gregariella chenui*, *Myxicola* spp., *Pholoides asperus*, and *Typosyllis* spp.

3.9 Wet Weight Determinations

Wet weight determinations were based on 0.0625 m² scraping samples collected from Legs B1 and B2 on Platform Harvest. Whole samples were wet weighed, and *Mytilus* removed for separate wet weight determinations. Wet weight determinations are provided in Table 3-19.

On Leg B1, total sample wet weights were quite variable, ranging from 149 to 5,059 g, with a mean value of 2,129 g per quadrat, or approximately 34 kg/m². Mussel biomass measurements were similarly variable, ranging from 0 to 4,025 g. As a result, the contribution of mussel biomass to total wet weight was extremely variable, ranging from 0 percent to 80 percent, with an average of 12.8 percent for the 12 samples measured from Leg B1.

On Leg B2, total sample wet weights were less variable than on the adjacent platform leg. Biomass measurements ranged from 2,281 to 25,966 g, with an average of 9,180 g, or approximately 147 kg/m². Similarly, mussel biomass measurements were consistently high, ranging from 3,752 to 17,779 g in the mussel zone; mussel biomass in the upper portions of the barnacle zone were very low (i.e., 1 to 7 g per sample). The relative contribution of mussel biomass to total sample wet weight were consistently high (64 percent to 81 percent) for samples taken from the mussel zone. However, mussel contributions were extremely limited (<1 percent) in the barnacle zone of Leg B2. In terms of depth distribution, the highest biomass values for mussels were evident between 3.4 and 5.8 m (11 and 19 ft), tapering off below 6.1 m (20 ft).

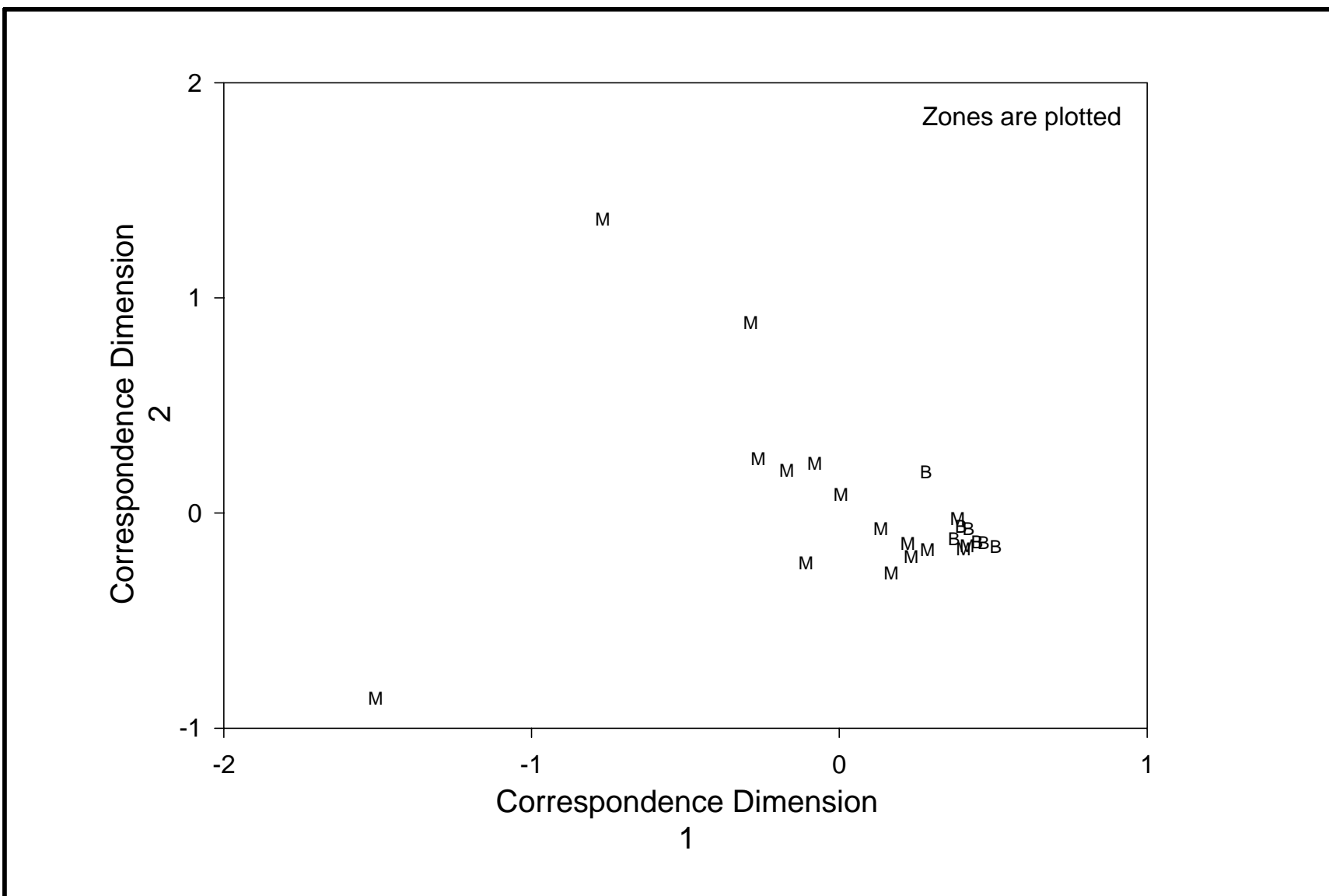


Figure 3-23. Correspondence analysis results, as determined through the comparison of mussel and barnacle zones for each of the six platforms and Diablo and Nifty Rocks.

Table 3-19. Summary of weight measurements for scraping samples from Platform Harvest.

Station/ Quadrat	Total Weight (g)	Mussel Weight (g)	Non-Mussel Weight (g)	Percent Mussel Weight
HA-B1-B-47	909.00	0.00	909.00	0.00
HA-B1-B-54	651.00	0.00	651.00	0.00
HA-B1-B-78	1,171.00	0.00	1,171.00	0.00
HA-B1-B-79	1,335.00	0.00	1,335.00	0.00
HA-B1-M-18	5,059.00	4,025.00	1,034.00	79.56
HA-B1-M-20	149.10	1.65	147.45	1.11
HA-B1-M-24	2,916.00	589.00	2,327.00	20.20
HA-B1-M-25	3,456.00	535.00	2,921.00	15.48
HA-B1-M-28	3,615.00	266.00	3,349.00	7.36
HA-B1-M-30	1,139.00	0.00	1,139.00	0.00
HA-B1-M-32	3,493.00	906.00	2,587.00	25.94
HA-B1-M-40	1,790.00	82.00	1,708.00	4.58
HA-B2-B-47	2,828.10	7.10	2,821.00	0.25
HA-B2-B-50	2,281.00	2.00	2,279.00	0.09
HA-B2-B-60	2,944.80	0.80	2,944.00	0.03
HA-B2-M-11	15,309.00	11,958.00	3,351.00	78.11
HA-B2-M-13	14,430.00	11,658.00	2,772.00	80.79
HA-B2-M-14	5,883.16	3,752.39	2,130.77	63.78
HA-B2-M-15	17,661.00	11,936.00	5,725.00	67.58
HA-B2-M-17	7,305.00	5,843.00	1,462.00	79.99
HA-B2-M-19	20,213.00	14,933.00	5,280.00	73.88
HA-B2-M-21	5,690.00	4,941.00	749.00	86.84
HA-B2-M-22	5,440.00	4,062.00	1,378.00	74.67
Total - Both Legs:	125,668.16	75,497.94	50,170.22	--
Mean:	5,463.83	3,282.52	2,181.31	33.05
Maximum:	20,213.00	14,933.00	5,725.00	86.84
Minimum:	149.10	0.00	147.45	0.00
Total - Leg B1:	25,683.10	6,404.65	19,278.45	--
Mean:	2,140.26	533.72	1,606.54	12.85
Maximum:	5,059.00	4,025.00	3,349.00	79.56
Minimum:	149.10	0.00	147.45	0.00
Total - Leg B2:	99,985.06	69,093.29	30,891.77	--
Mean:	9,089.55	6,281.21	2,808.34	55.09
Maximum:	20,213.00	14,933.00	5,725.00	86.84
Minimum:	2,281.00	0.80	749.00	0.03

Comparison of mussel weights to mussel presence in the photographs from Platform Harvest were confounding. While considerable variability in wet weights was evident both within and between platform legs, no significant differences in mussel presence were evident between Legs B1 and B2, based on photographic analyses.

Biomass values for the mussel and barnacle zones were extremely variable based on wet weight measurements from Platform Harvest. Total wet weight from a 0.0625 m² quadrat approached 26 kg (57 lb), equivalent to approximately 416 kg/m² (915 lb/m²). Mussel contributions to total sample biomass were also quite variable. However, in the mussel zone, such contributions can reach 80 percent of total sample biomass. Under these circumstances, mussel biomass may typically be in the 10-12 kg (22-26 lb) range and occasionally higher (i.e., up to approximately 18 kg [40 lb]) for a 0.0625 m² sample whose total wet weight was in the 12-25 kg (26-55 lb) range. In such samples, total mussel biomass is estimated at 160-192 kg/m² (352-422 lb/m²).

3.10 Individual Mussel Measurements

A total of 932 mussels were measured (i.e., length, width, and height) and weighed from 13 scraping samples collected from the mussel zone of Legs B1 and B2 of Platform Harvest. As noted previously, each scraping sample was retrieved from an area measuring 0.0625 m². Detailed results of individual mussel measurements are presented in **Appendix D**. Summary information from each sample is provided in **Table 3-20**.

The number of mussels present in each scraping sample was extremely variable, ranging from four mussels collected at 6 m (20 ft) below the surface on Leg B1 to 167 mussels collected at 5 m (15 ft) subsurface on Leg B2. Mussel size characteristics were also quite variable. Minimum and maximum average lengths, widths, and heights were 3.81 and 9.90 cm, 2.25 and 4.48 cm, and 1.67 to 3.42 cm, respectively. Individual average weights were also variable, ranging from 10.78 to 111.42 g. The smallest mussels were collected at water depths where the fewest mussels were available (i.e., 6 to 8 m; 20 to 25 ft) on Leg B1, while the larger mussel specimens were present in the 3 to 8 m (10 to 22 ft) depths of Leg B2.

3.11 Growth Thickness Measurements

Growth thickness measurements were made periodically within the mussel zones at platforms Harvest (Legs B1 and B2) and Irene (Leg A1). Thickness measures (**Table 3-21**) ranged from 5.1 to 30.5 cm (2 to 12 inches). Greatest thickness of the mussel zone occurred at the 14.3 to 16.5 m (47 to 54 ft) on Harvest Leg B1, at 6.7 m (22 ft) on Harvest Leg B2, and 0.3 to 2.7 m (1 to 9 ft) on Irene Leg A1.

Table 3-20. Summary of mussel measurements of scraping samples collected from Platform Harvest.

Station/ Quadrat	Number of Mussels	Average Length (cm)	Average Width (cm)	Average Height (cm)	Average Weight (g)
HA-B1-M-18	63	7.23	3.68	2.69	55.51
HA-B1-M-20	4	4.13	2.25	1.58	10.78
HA-B1-M-24	26	3.81	2.25	1.67	19.17
HA-B1-M-25	22	4.92	2.67	1.80	21.78
HA-B1-M-32	20	5.42	2.94	1.96	25.36
HA-B2-M-11	149	8.67	4.02	2.93	78.94
HA-B2-M-13	102	9.90	4.48	3.42	111.42
HA-B2-M-14	50	8.55	4.12	2.99	108.12
HA-B2-M-15	167	7.53	3.69	2.67	61.40
HA-B2-M-17	87	6.80	3.40	2.46	50.44
HA-B2-M-19	130	7.05	3.93	2.51	59.54
HA-B2-M-21	63	8.44	3.98	2.95	68.32
HA-B2-M-22	49	8.48	4.06	3.04	72.27

Table 3-21. Summary of growth thickness measurements.

Water Depth [m] (ft)	Growth Thickness [cm] (inches)
Platform Harvest, Leg B1:	
5.5 (18)	12.7 to 17.8 (5 to 7)
6.1 (20)	7.6 (3)
7.3 (24)	5.1 to 10.2 (2 to 4)
7.6 (25)	7.6 to 10.2 (3 to 4)
8.5 (28)	7.6 (3)
9.1 (30)	7.6 to 10.2 (3 to 4)
9.8 (32)	7.6 to 10.2 (3 to 4)
12.2 (40)	10.2 to 15.2 (4 to 6)
14.3 (47)	15.2 to 20.3 (6 to 8)
16.5 (54)	15.2 to 20.3 (6 to 8)
19.8 (65)	7.6 to 10.2 (3 to 4)
22.6 (74)	15.2 (6)
24.1 (79)	15.2 (6)
Platform Harvest, Leg B2:	
3.4 (11)	20.3 to 25.4 (8 to 10)
4.3 (14)	15.2 (6)
4.6 (15)	25.4 (10)
5.2 (17)	15.2 (6)
5.8 (19)	20.3 (8)
6.4 (21)	25.4 (10)
6.7 (22)	30.5 (12)
14.3 (47)	7.6 to 10.2 (3 to 4)
15.2 (50)	7.6 (3)
16.5 (54)	7.6 (3)
18.3 (60)	7.6 to 10.2 (3 to 4)
Platform Irene, Leg A1:	
0.3 to 2.7 (1 to 9)	15.2 to 20.3 (6 to 8)
2.7 to 3.0 (9 to 10)	15.2 (6)
3.4 to 4.0 (11 to 13)	12.7 (5)
4.3 to 4.6 (14 to 15)	10.2 to 12.7 (4 to 5)
5.2 (17)	10.2 (4)

4.0 Discussion

4.1 Overview and Historical Perspective

Until recently, no comprehensive survey-based characterization of invertebrate or algal communities associated with California's offshore platforms has been completed. Historically, available information has been acquired as a result of species- or group-specific analyses, or as part of studies designed to determine the effects of drilling discharges on platform-associated fauna. Research on *Mytilus*, a recognized dominant invertebrate in California platform communities, has historically centered on its intertidal occurrence. Subtidal mussel communities have not been as thoroughly characterized as those that occur intertidally. Mussel beds, whether intertidal or subtidal, have been characterized as highly productive and complex communities that support a significant proportion of total productivity within nearshore benthic communities (see reviews by Gosling, 1992; Seed and Suchanek, 1992; and Helmuth, 1998).

Only a limited number of researchers have characterized the faunal communities found in association with California's offshore platforms. MBC Applied Environmental Sciences (1987) summarized the available information on the ecology of oil and gas platforms. While their efforts concentrated primarily on fishes found in association with platforms, these investigators also synthesized and summarized available data on platform-associated invertebrate communities. MBC determined that platform epibiota were comprised primarily of mollusks, barnacles, and polychaetes, with bay mussels (*Mytilus edulis*) and California mussels (*Mytilus californianus*) being dominant. Platform communities have been characterized by the predominant presence of filter feeding fauna. Platform communities also exhibit definitive successional stages following periods of disturbance, whether through natural sloughing (e.g., removal of portions of the mussel bed community as a result of wave or storm surge) or man-induced disturbance (e.g., platform leg cleaning operations, mussel harvesting). MBC Applied Environmental Sciences (1987) suggested that the fauna associated with a particular platform may be influenced by various factors, including (but not limited to) platform location (i.e., water depth, distance from shore, proximity to hard bottom features, and seafloor characteristics), length of time in place and season of installation, and local hydrography.

Page et al. (1999) examined the abundance and distribution of three species of commercially important cancrivora crabs (i.e., rock crab, *Cancer antennarius*; yellow crab, *C. anthonyi*; and red crab, *C. productus*), and the majid crab *Loxorhynchus grandis* (sheep crab) in order to determine whether crabs occurred in higher densities beneath a platform compared to adjacent soft bottom. They also characterized the spatial and temporal patterns of crab recruitment to a platform (Platform Holly, 66 m water depth in the Santa Barbara Channel) and evaluated the data within the context of four hypothesized abundance and distribution scenarios. Page et al. (1999) noted that the invertebrate community on platform conductor pipes varied in thickness with depth and time. Thickness was greatest over time at a depth of 12 m and least at depths of 18 and 24 m. Rates of faunal litterfall to the benthos varied significantly over time ranging from 0.08 ± 0.03 to 2.6 ± 0.81 kg (wet weight) per trap per week. Rates of annual litterfall were significantly higher during two periods (i.e., October to March; August to

September) than during other times (April to June). *Mytilus galloprovincialis* formed the majority (approximately 93%) of this material. Rock, yellow, and red crabs (*C. antennarius*, *C. anthonyi*, and *C. productus*) and the sheep crab (*Loxorhynchus grandis*) were caught in traps beneath Platform Holly. Of the four crab species studied, only *C. antennarius* recruited onto the platform structure. Recruitment was seasonal as crabs ≤ 10 mm carapace width were most abundant during late spring and summer. In the recruitment cages, there were no differences in the densities of crabs among depth at 12, 18, and 24 m. Of the four crab species, only *C. antennarius* were observed in visual surveys on the platform. There was no effect of time or depth on density which ranged from 0-4 crabs/m². When data from mussel community samples and visual surveys were combined, crab density increased dramatically at 12 m (as compared to observations 18 or 24 m) during late spring and early summer as a result of recruitment. Trapping data suggests that adult *C. antennarius* were less abundant on the structure than on the bottom. Two of the four crab species (*C. antennarius*, *C. anthonyi*) occurred in higher densities at the platform compared to the surrounding soft bottom. Page et al. (1999) suggest that the platform structure and its associated invertebrate community may provide crabs with food, recruitment habitat, preferred habitat of adults, and/or increased shelter from predation. Both *Cancer* species may be attracted to the platform by food provided by the mussel community found from the surface to depth of less than 12 to 15 m and through faunal litterfall. The platform provides recruitment habitat only for *C. antennarius*. Recruitment contributed to elevated densities of small individuals of this species during the later winter and early spring months. Similar results were shown in Winn (1985).

Several other researchers affiliated with the Marine Science Institute at the University of California, Santa Barbara are currently studying various aspects of platform-associated communities. Bram et al. (2002) characterized the early development of subtidal invertebrate assemblages on Platform Houchin in the Santa Barbara Channel. The study design was based on the seasonal sampling of settling plates conducted over a two-year period. Plates were placed at 2-m increments (between 2 and ~18 m subsurface). Bram et al. (2002) determined that there was a strong seasonal component to settling at Platform Houchin, that competition for open space was hearty (i.e., limited open space available after four months; no open space available after 24 months), and that tunicates and bryozoans were dominant at all depths sampled during the first few months. Barnacles became more dominant at select depths within approximately one year. Between Year 1 and Year 2, researchers noted an increase in the coverage of barnacles and sponges, with a corresponding decrease in tunicates. The mussel community showed similar levels of coverage each year.

Culver et al. (2002) determined the spatial distribution patterns of platform-associated invertebrates on a series of platforms in the Santa Maria Basin and Santa Barbara Channel. Platforms included Gail, Grace, Gilda, Gina, Hogan, Holly, and Houchin. Using photoquadrats at 6, 12, 18, and 24 m water depths, researchers sampled on conductor pipes and outside legs of these platforms. Preliminary comparisons at the 12 m sampling depth suggested that each platform contains unique fauna. Clustering analyses also suggested that there was some degree of similarity between platforms (i.e., groupings of Grace and Gilda; Gail and Gina; Hogan, Houchin, and Holly). Culver et al. (2002) also noted that the southeastern platforms (Gail, Grace, etc.) showed increases in mussel growth in summer, with similar growth patterns evident for all platforms during winter and fall. Species distribution and abundance were variable between the platforms, with recruitment of select taxa also variable.

There is increasing evidence that oil and gas platforms off California provide important habitat for a variety of fish species, several of which are of economic importance. Further, the potential conversion of California oil and gas platforms (i.e., those which have reached the end of their productive life) to artificial reefs has prompted debate, discussion, and a series of questions amongst resource managers, commercial and recreational fishing interests, scientists, and the general public. The U.S. Department of the Interior (USDOI) funded a series of studies beginning in the early 1990s to characterize fish assemblages at platforms and naturally-occurring rock outcrops. In recent years, researchers at the University of California, Santa Barbara (UCSB) have undertaken a variety of studies (with funding from USDOI and the California Reef Enhancement Program) to further characterize platform- and natural outcrop-associated fish species. While a thorough summarization of these efforts lies beyond the scope of the present analysis, several study results are relevant:

- Love et al. (1999, 2003) – Nine platforms in the Santa Barbara Channel and Santa Maria Basin were sampled annually between 1995 and 2000, with several other platforms surveyed a single time. With exception of the shallow-water Platform Gina, three distinct fish assemblages were found in association with offshore platforms – midwater, bottom, and shell mound. The middle of the water column acts as a nursery ground for juvenile rockfishes, as well as blacksmith, painted greenling, and several other fish species. The base (bottom) of several platforms provide habitat to rockfishes, primarily adults of a variety of species, as well as lingcod and combfishes. The shell mound found at and near the base of each platform provides habitat to rockfish, including juveniles of the species found at the platform base and an assortment of lingcod, painted greenling, gobies, several flatfish species, and combfishes. Platforms usually harbor higher number of young-of-the-year rockfishes than natural outcrops and may be functionally more important as nurseries. In some locations, platforms may provide much or all of the adult fishes of some heavily fished species and thus contribute disproportionately to those species' larval production. Several platforms may be important to regional rockfish production.
- UCSB Coastal Marine Institute (2004) – Page and colleagues at UCSB are conducting a study to characterize ecological performance and to determine the trophic links of fishes and their prey at both platforms and natural reefs. Monthly sampling has occurred at Naples and Mohawk reefs and platforms Holly and Houchin in the Santa Barbara Channel. Of primary interest are the potential food items of painted greenling, including small amphipod crustaceans.

The importance of several platforms to regional rockfish production, coupled with the pending characterization of the trophic links between platform-associated fishes and their prey, might suggest that platform-associated invertebrate and algal communities may play a role in supporting fish populations at a local or regional level.

4.2 Study Limitations

A number of study limitations were evident following completion of the photographic data analysis. While a standardized approach to ROV and diver photography was accomplished (i.e., production of standard, repetitive image size), inherent limitations to

photographic interpretation were noted. Specifically, there were limits evident in the taxonomists' ability to completely identify specimens in the photographs. Factors which limited a complete identification of specimens in the photographs include:

- Specimen size – under ideal conditions, a nominal specimen size of 3 cm (1 inch) was noted. Digitizing the 35-mm transparencies provided some degree of increased resolution in many instances.
- Shadow – in some instances, the presence of shadow precluded complete identification of all specimens in a particular photograph. The presence of shadow also highlights the fact that, in many cases, there was a complex, three-dimensional structure to platform-associated communities. In these instances, the underlying species may or may not be visible for identification. A good example of this phenomenon was noted in the barnacle/scallop zone of Platform Gail, where a total of only eight *Crassadoma gigantea* were noted on both legs during photographic analysis. Low scallop density may be attributed to the dense overgrowth of the strawberry anemone, *C. californica*, which effectively covers and blocks the view of underlying scallops. *C. californica* was a dominant species, by density and percent cover, on both legs and prevalent in water depths where *Crassadoma* had previously been documented (i.e., 12 to 49 m; 40 to 160 ft).
- Taxonomic limitations - some difficulty was encountered completing a species identification based solely on photographic data. The absence of a specimen in hand occasionally precluded a species level determination, although the project taxonomists attempted to identify each specimen to the lowest practical taxon.

While some of these limitations were rectified with completion of the scraping data analysis, it is noted that only limited scraping data were available (i.e., scrapings collected only from the barnacle and *Mytilus* zones of platforms Harvest and Gail). Invertebrate phylogenetic standardizations conform to the most recent guidelines prepared by the Southern California Association of Marine Invertebrate Taxonomists (2001).

Cleaning of the platform jacket and cross members may also have an effect on invertebrate and algal community characterization results. Discussions with platform operators indicates that cleaning operations are typically restricted to the upper 8 m (25 ft) of the platform, effectively between the intertidal zone and the *Mytilus* or barnacle zones. Cleaning operations are routinely completed on an irregular basis, typically annually, weather permitting. Most cleaning operations occur in spring or summer (R. Hamson, Veneco, Inc., pers. comm., 2005). In addition, mussel harvesting may also occur in conjunction with cleaning or as a separate activity on select platforms (e.g., Platform Grace). Finally, natural sloughing of biota within the upper portions of the platform jacket may also occur during storm periods or as a result of heavy swells, creating open space for planktonic colonizers. Litterfall contributes biomass and hard substrate to the shell mound community at the base and down current of the platform.

4.3 Comparisons Between Adjacent Platform Legs

Comparisons of taxa between adjacent platform legs utilized the whole slide analysis (QSA) and, to a lesser extent, the PointCount'99® results. The primary basis for comparison was the density-dominant data set because it represents the most comprehensive and thorough

analysis. The discussion was further supplemented by percent cover-dominant data, as appropriate. Because the PointCount'99® results were found to be very consistent with results of the whole slide analysis, they were not considered in detail in the following comparisons, although comparisons between percent cover estimates (i.e., PointCount'99® vs. QSA) have been detailed in **Section 4.4.4**.

4.3.1 Platform Gail

Legs A1 and B1 were sampled at Platform Gail. Based on complete analysis of 196 photographs from both legs, 74 total taxa were identified, of which 41 percent (30) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with a few specimens enumerated at higher taxonomic levels. Only five floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Codium*; encrusting coralline algae; filamentous green algae; foliose red algae) were among the 74 total taxa observed. One undifferentiated assemblage (turf) and one physical characteristic (bare metal) were also observed at Platform Gail. There were also indications that the upper portions (i.e., within the upper 8 m) of both legs of Platform Gail had been recently cleaned.

Based on density determinations, 29 total taxa, plus turf and bare metal, were found to be common to both legs, while 20 taxa were unique to Leg B1 and 25 taxa were unique to Leg B2 (**Table 4-1**). Dominant taxa common to both legs included *Balanus* spp., *Corynactis californica*, *Desmophyllum*, filamentous red algae, *Metridium exilis*, *Metridium senile*, *Mytilus* spp., unidentified ophiuroids, *Ophiothrix spiculata*, calcareous worm tubes, and plain worm tubes. Among the taxa unique to Leg B1, dominant species included *Anthopleura elegantissima* (rosy morph) and *Metridium farcimen*. *Amphipholis* and *Protula superba* were determined to be unique to Leg B2.

The top three density-dominant taxa common to both legs on Platform Gail (i.e., *Corynactis californica*, *Metridium exilis*, and *Metridium senile*) exhibited considerable between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence (see **Tables 3-3** and **3-4**). *Corynactis* exhibited the highest and second highest densities on Legs A1 and B1, respectively, occurring in 35 percent and 19 percent of the samples and averaging 449 and 160 individuals/0.0625 m². On Leg A1, *Corynactis* totaled 15,263 individuals, while on Leg B1 its total numbers decreased to 3,305 individuals, indicative of its reduced frequency of occurrence and, when present, its lower density.

Metridium exilis exhibited the highest and second highest densities on Legs B1 and A1, respectively, occurring in 62 percent and 32 percent of the samples and averaging 340 and 147 individuals/0.0625 m². On Leg B1, *M. exilis* totaled 20,739 individuals, while on Leg A1 its total numbers decreased to 4,554 individuals.

Metridium senile exhibited the third highest total densities on both legs, occurring in 70 percent and 44 percent of the samples and averaging 60 and 39 individuals/0.0625 m² on Legs A1 and B1, respectively. Total numbers of *M. senile* ranged between 4,227 and 1,669 individuals.

Table 4-1. Comparison of taxa between Legs A1 and B1 of Platform Gail based on the results of quantitative slide analysis.

<u>Common to Both Legs</u>				<u>Unique to Leg A1</u>		
<i>Balanus nubilus</i>		Ophiuroid, unidentified *		Aeolidioidea		<i>Oxylebius pictus</i>
<i>Balanus</i> spp. *		<i>Ophiothrix spiculata</i> *		<i>Amphianthus californica</i>		<i>Spirobranchus</i>
Bare Metal *		<i>Paracyathus stearnsii</i>		<i>Anthopleura elegantissima</i> (rm) *		Tunicate, encrusting tan *
<i>Corynactis californica</i> *		<i>Sebastes</i> spp.		Bryozoa, white branching		Zoanthid, colonial tan *
<i>Crassadoma gigantea</i>		Sponge, cup tan *		<i>Cancer antennarius</i>		
Doridacea		Sponge, green encrusting		<i>Chama arcana</i>		
<i>Desmophyllum dianthus</i> *		Sponge, orange encrusting *		<i>Codium</i>		
Encruster - orange		Sponge, purple encrusting		<i>Coenocyathus bowersi</i>		
Encruster - white		Sponge, tan encrusting *		<i>Dermasterias imbricata</i>		
Encruster - yellow		Sponge, white encrusting		Encrusting coralline		
Filamentous red algae *		Sponge, yellow encrusting		<i>Eudistylia polymorpha</i>		
<i>Galathea californiensis</i>		Turf *		<i>Florometra serratissima</i>		
Hydroid, tan branching *		Urochordata (<i>Cystodytes</i> , <i>Aplidium</i> , <i>Styela</i>)		<i>Hemigrapsus nudus</i>		
<i>Metridium exilis</i> *		Worm tubes, calcareous *		Hydroid, pink		
<i>Metridium senile</i> *		Worm tubes, plain *		<i>Metridium farcimen</i> *		
<i>Mytilus</i> spp. *				<i>Orthasterias koehleri</i>		

<u>Unique to Leg B1</u>						
						<i>Actiniaria</i> , pink
						<i>Allocentrotus fragilis</i>
						<i>Amphipholis</i> spp. *
						<i>Aplidium</i>
						<i>Asterina miniata</i> (= <i>Patiria</i>)
						Bryozoa, tan branching
						Chiton, unidentified
						Cup coral, white
						Encruster - tan
						Filamentous green alga
						Foliose red algae
						Gorgonian, unidentified
						<i>Halichondria panacea</i> *
						Hydroid, white
						<i>Leucetta</i> *
						<i>Ophiocantha diplasia</i>
						<i>Pisaster giganteus</i>
						<i>Pleurobranchaea californica</i>
						<i>Protula superba</i> *
						<i>Pycnopodia helianthoides</i>
						Sponge, tan globose *
						<i>Stylasterias forreri</i>
						Tunicate, globular
						Zoanthid, solitary tan
						Zoanthid, tan (<i>Palythoa</i>) *

<u>Comparison of co-occurring dominant taxa (or physical characteristics) on adjacent legs of Platform Gail</u>						
Taxon	Total	Leg A1 Average per Occurrence	Frequency (%)	Total	Leg B1 Average per Occurrence	Frequency (%)
Density:						
<i>Corynactis californica</i>	15,263	448.9	34.7	3,035	159.7	19.4
<i>Metridium exilis</i>	4,554	146.9	31.6	20,739	340.0	62.2
<i>Metridium senile</i>	4,227	60.4	71.4	1,669	38.8	43.9
Filamentous red algae	752	27.9	27.6	277	11.1	25.5
<i>Ophiothrix spiculata</i>	533	24.2	22.4	206	15.8	13.3
<i>Mytilus</i> spp.	497	35.5	14.3	607	24.3	25.5
<i>Desmophyllum dianthus</i>	416	21.9	19.4	210	12.4	17.3
<i>Balanus</i> spp.	145	9.1	16.3	180	9.5	19.4
Worm tubes, plain	62	8.9	7.1	124	5.6	22.4
Percent Cover:						
<i>Corynactis californica</i>		64.0	34.7		22.8	19.4
<i>Mytilus</i> spp.		60.4	14.3		19.2	25.5
<i>Metridium senile</i>		41.7	71.4		31.8	43.9
Bare Metal		33.3	38.8		49.2	42.9
<i>Metridium exilis</i>		23.0	31.6		62.0	62.2
Turf		6.0	35.7		8.4	46.9
Sponge, tan encrusting		4.0	31.6		10.5	34.7

* - indicates dominant taxon (or physical characteristics) on one or both platform legs

Depth of distribution among the dominant taxa was also variable between the two platform legs. *Corynactis* present on Leg A1 was evident across a wide depth range between 10 and 125 m (34 and 410 ft), with highest concentrations in 16 to 66 m (53 to 216 ft) water depths. On Leg B1, this species was more restricted in its depth distribution, present between 17 and 98 m (57 and 322 ft), with highest concentrations in the 19 to 26 m (63 to 86 ft) depth range. By comparison, *Metridium exilis* on Leg B1 was evident across a wide depth range between 10 and 125 m (3 and 322 ft), with a single occurrence at 158 m (518 ft) and variable but relatively high concentrations throughout its depth range. On Leg A1, this species was more restricted in its depth distribution and intermittently present between 1 and 41 m (4 and 134 ft).

Mytilus spp. was limited in its presence on Leg A1, occurring only between the 1 and 3 m (4 and 9 ft) water depths. By contrast, its distribution on Leg B1 extended between 1 and 16 m (3 and 53 ft). When present, mussel densities were very low when compared to other platforms. Low densities and limited depth distribution of *Mytilus* on both legs was attributed to prior leg cleaning activity. Another dominant taxon, *Desmophyllum* (*Desmophyllum dianthus*), was present only on Platform Gail. While ranked among the top 12 density-dominants on both legs, its distribution on Leg A1 extended between 111 and 223 m (363 and 733 ft), while it occurred between 181 and 224 m (594 and 734 ft) on Leg B1.

Percent cover estimates of the dominant taxa (or physical characteristics) on Platform Gail also exhibited considerable variability between adjacent legs. Percent cover dominants and respective average cover on Leg A1 included *Corynactis californica* (64 percent), *Mytilus* spp. (60 percent), *Metridium senile* (42 percent), bare metal (33 percent), *Anthopleura elegantissima* (rosy morph; 26 percent), and *Metridium exilis* (23 percent). On Leg B1, percent cover dominants and respective average cover included *Metridium exilis* (62 percent), bare metal (49 percent), *Metridium senile* (32 percent), *Halichondria panacea* (30 percent), *Corynactis californica* (23 percent), and *Mytilus* spp. (20 percent).

4.3.2 Platform Grace

Legs C1 and C4 were sampled at Platform Grace. Based on analysis of 150 photographs, 61 total taxa were identified, of which 36 percent (22) were monospecific taxa (i.e., species level identification). Remaining taxa were identified to genus level or higher. Only two floral taxa (i.e., filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*; *Ulva lactuca*) were among the 61 total taxa observed. Two undifferentiated assemblages (turf, bryozoa turf) and two physical characteristics (bare metal, line) were also observed at Platform Grace. While mussel harvesting had occurred recently at Platform Grace, cleaned areas were avoided during photographic sampling.

Based on density determinations, 29 total taxa, plus turf and bare metal, were noted as being common to both legs, while 22 taxa, plus bryozoa turf, were unique to Leg C1 and 10 taxa were unique to Leg C4 (Table 4-2). Dominant taxa common to both legs included *Anthopleura elegantissima* (rosy morph), *Balanus nubilus*, *Balanus* spp., *Coenoclyathus bowersii*, *Corynactis californica*, filamentous red algae, *Metridium farcimen*, *Metridium senile*, *Mytilus* spp., *Ophiothrix spiculata*, *Paracyathus stearnsii*, turf, and calcareous worm tubes. Among the taxa unique to Leg C1, dominant species consisted solely of *Mytilus californianus*, while *Metridium exilis* was unique to Leg C4.

Table 4-2. Comparison of taxa between Legs C1 and C4 of Platform Grace based on the results of quantitative slide analysis.

<u>Common to Both Legs</u>				<u>Unique to Leg C1</u>		
<i>Anthopleura elegantissima</i> (rm) *		Hydroid, tan branching *		Anemone, pink		Line
<i>Balanus nubilus</i> *		<i>Metridium farcimen</i> *		Anemone, unidentified		<i>Mytilus californianus</i> *
<i>Balanus</i> spp. *		<i>Metridium senile</i> *		<i>Anisodoris nobilis</i>		<i>Obelia</i> sp.
Bare Metal *		<i>Mytilus</i> spp. *		<i>Anthopleura xanthogrammica</i>		<i>Oxylebius pictus</i>
Bryozoa, tan branching		<i>Ophiothrix spiculata</i> *		<i>Asterina miniata</i> = <i>Patiria</i>		<i>Parastichopus californicus</i>
<i>Coenocyathus bowersi</i> *		Ophiuroid, unidentified		Bryozoa turf *		<i>Polyclinum planum</i>
<i>Corynactis californica</i> *		<i>Paracyathus stearnsii</i> *		Bryozoa, white branching		Sponge, gray encrusting *
<i>Crassadoma gigantea</i>		<i>Sebastes</i> sp.		<i>Dialula sandiegensis</i>		Sponge, orange encrusting
Encruster - blue		Sponge, tan encrusting *		Dorid, yellow (? <i>Doriopsilla</i>)		Sponge, purple encrusting
Encruster - pink		Sponge, white encrusting		Hydroid, pink		<i>Styela</i> sp.
Encruster - white		Sponge, yellow encrusting *		Hydroid, white clump		Tunicate, encrusting tan
Encruster - yellow		<i>Strongylocentrotus purpuratus</i>		<i>Leucilla nuttingi</i>		<i>Urticina</i>
Filamentous red algae *		<i>Stylasterias forreri</i>				
Foliose red algae		Turf *				
<i>Hermisenda crassicornis</i>		Worm tubes, calcareous *				
Hydroid, tan *						

<u>Comparison of co-occurring dominant taxa (or physical characteristics) on adjacent legs of Platform Grace</u>							<u>Unique to Leg C4</u>
Taxon	Total	Leg C1 Average per Occurrence	Frequency (%)	Total	Leg C4 Average per Occurrence	Frequency (%)	
Density:							Aeolid, unidentified
<i>Corynactis californica</i>	5,720	211.9	37.0	7,917	344.2	29.9	Anthozoa, unidentified *
<i>Paracyathus stearnsii</i>	2,085	71.9	39.7	214	26.8	10.4	<i>Cliona</i> spp., yellow *
<i>Mytilus</i> spp.	1,357	79.8	23.3	1,824	76.0	31.2	<i>Leucetta</i>
<i>Ophiothrix spiculata</i>	987	26.7	50.7	1,548	46.9	42.9	<i>Metridium exilis</i> *
<i>Balanus</i> spp.	627	27.3	31.5	548	24.9	28.6	Sponge, cup tan
<i>Anthopleura elegantissima</i> (rm)	441	25.9	20.5	191	13.6	18.2	Sponge, tan foliose
Turf	64	1.0	87.7	46	1.0	59.7	Sponge, yellow erect
<i>Metridium senile</i>	54	10.8	6.8	1,769	43.1	53.2	<i>Ulva lactuca</i>
Filamentous red algae	25	1.0	34.2	24	1.0	31.2	Zoanthid, colonial tan *
Percent Cover:							
<i>Mytilus</i> spp.		49.1	23.3		52.6	31.2	
<i>Corynactis californica</i>		42.6	37.0		69.2	29.9	
Turf		37.4	87.7		25.6	59.7	
<i>Anthopleura elegantissima</i> (rosy morph)		30.8	20.5		8.7	18.2	
Hydroid, tan		25.0	1.4		18.2	14.3	
Filamentous red algae		21.2	34.2		16.7	31.2	
Sponge, tan encrusting		9.8	27.4		6.6	6.6	
Bare metal		7.5	2.7		8.4	6.5	

* - indicates dominant taxon (or physical characteristics) on one or both platform legs

The top three density-dominant taxa on each leg of Platform Grace (i.e., *Corynactis californica*, *Paracyathus stearnsii*, and *Mytilus* spp. on Leg C1; *Corynactis californica*, *Mytilus* spp., and *Ophiothrix spiculata* on Leg C4) exhibited moderate between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence (see **Tables 3-5** and **3-6**). *Corynactis* exhibited the highest densities on Legs C1 and C4, occurring in 37 percent and 30 percent of the samples and averaging 212 and 344 individuals/0.0625 m², respectively. On Leg C1, *Corynactis* totaled 5,720 individuals, while on Leg C4 its total numbers increased to 7,917 individuals, in spite of its reduced frequency (i.e., higher density when present). *Mytilus* spp. exhibited the third and second highest densities on Legs C1 and C4, respectively, occurring in 23 percent and 31 percent of the samples and averaging 80 and 76 individuals/0.0625 m². On Leg C1, *Mytilus* spp. totaled 1,357 individuals, while on Leg C4 its total numbers increased to 1,824 individuals. *Paracyathus stearnsii* exhibited the second highest total density on Leg C1, occurring in 40 percent of the samples and averaging 72 individuals/0.0625 m². On Leg C4, this species was ranked sixth in terms of density, occurring in only 10 percent of the samples and, when present, averaging only 27 individuals/0.0625 m². *Ophiothrix spiculata* exhibited the third highest total density on Leg C4, occurring in 43 percent of the samples and averaging 47 individuals/0.0625 m². On Leg C1, this species was ranked fourth in terms of density, occurring in 51 percent of the samples and averaging 27 individuals/0.0625 m².

Depth of distribution among the dominant taxa was also variable between the two platform legs. *Corynactis* present on Leg C1 was evident across a limited depth range between 9 and 52 m (30 and 172 ft), with highest concentrations in 12 to 27 m (38 to 88 ft) water depths. On Leg C4, this species was similarly distributed, present between 12 and 58 m (39 and 191 ft), with highest concentrations in the 19 to 45 m (61 to 146 ft) depth range. By comparison, *Mytilus* spp. on Leg C1 was evident across a limited depth range between 1 and 6 m (3 and 19 ft); on Leg C4, this taxon was present in two bands, at 1 to 4 m (3 to 14 ft) and 10 to 12 m (33 to 39 ft). *Paracyathus stearnsii* was present on Leg C1 between 34 and 94 m (111 and 308 ft) water depths. By contrast, its distribution on Leg C4 was more restricted, extending only between 41 and 60 m (133 and 197 ft). *Ophiothrix spiculata* exhibited an interesting distribution on Platform Grace. On Leg C1, this ophiuroid species was present in lower average densities (27 individuals/0.0625 m²) across a wider depth distribution between 1 and 78 m (3 and 256 ft); on Leg C4, this species occurred in higher densities (47 individuals/0.0625 m²) in a more restricted depth distribution between 2 and 45 m (6 and 146 ft).

Metridium exilis, a dominant on Platform Gail, was present as a density dominant but unique only to Leg C4 of Platform Grace. This species exhibited a very limited distribution, occurring between 20 and 23 m (67 and 74 ft); when present, however, it occurred in relatively high densities averaging 32 individuals/0.0625 m².

Mytilus californianus, only documented at platforms Grace and Habitat and Diablo and Nifty Rocks, was present as a density dominant but unique only to Leg C1 of Platform Grace. This species exhibited very restricted depth distribution, occurring only at approximately 2 m (i.e., between 7 and 8 ft); when present, this mussel species occurred in relatively high densities averaging 62 individuals/0.0625 m².

Percent cover estimates of the dominant taxa on Platform Grace exhibited moderate variability between adjacent legs. Percent cover dominants and respective average cover on

Leg C1 included *Mytilus* spp. (49 percent), *Corynactis californica* (43 percent), turf (37 percent), *Anthopleura elegantissima* (rosy morph; 31 percent), a tan hydroid (25 percent) and filamentous red algae (20 percent). On Leg C4, percent cover dominants and respective average cover included *Corynactis californica* (69 percent), *Mytilus* spp. (53 percent), *Metridium senile* (39 percent), turf (26 percent), and filamentous red algae (17 percent).

4.3.3 Platform Harvest

Legs B1 and B2 were sampled at Platform Harvest. Based on complete analysis of 178 photographs from both legs, 53 total taxa were identified, of which 34 percent (18) were monospecific taxa (i.e., species level identification). Remaining taxa were identified primarily to genus level, with several specimens enumerated at higher taxonomic levels. Only three floral taxa (i.e., foliose red algae; *Egregia*; filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*) were among the 53 total taxa observed. One undifferentiated assemblage (turf) and two physical characteristics (bare metal, line) were also observed at Platform Harvest. There was no indication that recent cleaning activity had occurred at this platform.

Based on density determinations, 30 total taxa, plus turf and bare metal, were found to be common to both legs, while 13 taxa were unique to Leg B1 and 10 taxa, plus an egg case, were unique to Leg B2 (**Table 4-3**). Dominant taxa common to both legs included *Anthopleura elegantissima* (rosy morph), *Balanus* spp., *Corynactis californica*, a red encruster, *Leucetta*, *Metridium senile*, *Mytilus* spp., an unidentified ophiuroid, *Pollicipes polymerus*, an encrusting translucent tunicate, and calcareous worm tubes. Turf was also a predominant biological component present on both platform legs. No taxa unique to Leg B1 were dominant species, while only filamentous red algae were dominant and unique to Leg B2.

The top three density-dominant taxa common to both legs on Platform Harvest (i.e., *Metridium senile*, an unidentified ophiuroid [probably *Ophiothrix spiculata*], and *Mytilus* spp. on Leg B1; *Metridium senile*, an unidentified ophiuroid, and *Leucetta* on Leg B2) exhibited moderate between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence (see **Tables 3-7** and **3-8**). Highest average densities were exhibited by *Corynactis* on Leg B1 (168 individuals/0.0625 m²), however, this species was only present in 4 percent of the samples; its densities dropped significantly on the adjacent Leg B2 to 36 individuals/0.0625 m². Aside from *Corynactis*, *Metridium senile* exhibited the highest densities on both legs, occurring in 89 percent and 87 percent of the samples and averaging 39 and 30 individuals/0.0625 m² on Legs B1 and B2, respectively. On Leg B1, *Metridium senile* totaled 3,168 individuals, while on Leg B2 its total numbers decreased to 2,216 individuals, in conjunction with its reduced frequency. The unidentified ophiuroid, thought to be *Ophiothrix spiculata* based on scraping analysis results, occurred in 37 and 41 percent of the samples and averaged 23 and 45 individuals/0.0625 m² on Legs B1 and B2, respectively. *Mytilus* spp. exhibited the third and fourth highest densities on Legs B1 and B2, respectively, occurring in 22 percent and 24 percent of the samples and averaging 37 and 41 individuals/0.0625 m². On Leg B1, *Mytilus* spp. totaled 734 individuals, while on Leg B2 its total numbers increased to 858 individuals. *Leucetta* was also a dominant taxon, occurring in 20 percent of the samples on Leg B1 and 24 percent of the samples on Leg B2.

Table 4-3. Comparison of taxa between Legs B1 and B2 of Platform Harvest based on the results of quantitative slide analysis.

<u>Common to Both Legs</u>		<u>Unique to Leg B1</u>		<u>Unique to Leg B2</u>	
<i>Aeolidia papillosa</i>	<i>Galathea californiensis</i>	Barnacle, unidentified		Anomiidae	
<i>Anthopleura elegantissima</i> (rm) *	<i>Leucetta</i>	<i>Botrylloides</i> spp. *		<i>Calliostoma</i> spp.	
<i>Balanus nubilus</i>	<i>Leucetta losangelensis</i> *	<i>Crassadoma gigantea</i>		<i>Cancer antennarius</i>	
<i>Balanus</i> spp. *	<i>Leucilla nuttingi</i>	<i>Egregia</i> spp.		Egg case	
Bare Metal *	<i>Metridium senile</i> *	Encruster, lavender *		<i>Eudendrium</i> spp.	
Bivalve, nestling	<i>Mytilus</i> spp. *	<i>Hermisenda crassicornis</i>		<i>Eudistylia polymorpha</i>	
Bryozoa, tan branching	Ophiuroid, unidentified *	Line		Filamentous red algae *	
Bryozoa, white branching	<i>Plumularia</i> spp.	<i>Metridium farcimen</i> *		Gastropoda, unidentified	
<i>Corynactis californica</i> *	<i>Pollicipes polymerus</i> *	<i>Metridium</i> spp.		<i>Oxylebius pictus</i>	
Encruster - tan	<i>Sebastes</i> spp.	<i>Pisaster ochraceus</i>		<i>Paracyathus stearnsii</i>	
Encruster - white	Sponge, tan encrusting	Spionidae		Sponge, white encrusting	
Encruster - yellow *	Sponge, yellow encrusting	<i>Stylasterias forreri</i>			
Encruster, green	Tunicate, encrusting translucent *	Zoanthid, colonial tan			
Encruster, pink	Turf *	Zoanthid, solitary tan			
Encruster, red *	Worm tubes, calcareous *				
Foliose red algae *	Worm tubes, plain				

<i>Comparison of co-occurring dominant taxa (or physical characteristics) on adjacent legs of Platform Harvest</i>						
Taxon	Total	Leg B1 Average per Occurrence	Frequency (%)	Total	Leg B2 Average per Occurrence	Frequency (%)
Density:						
<i>Metridium senile</i>	3,168	38.6	89.1	2,216	29.5	87.2
Ophiuroid, unidentified	782	23.0	37.0	1,566	44.7	40.7
<i>Mytilus</i> spp.	734	36.7	21.7	858	42.8	23.3
<i>Corynactis californica</i>	672	168.0	4.3	179	35.8	5.8
<i>Leucetta losangelensis</i>	354	13.1	29.3	1,473	50.8	33.7
<i>Balanus</i> spp.	188	5.9	34.8	169	4.2	46.6
<i>Anthopleura elegantissima</i> (rm)	124	7.8	17.4	160	9.4	19.8
Worm tubes, calcareous	105	3.5	32.6	68	2.8	27.9
Turf	72	1.0	78.3	71	1.0	82.6
Encruster, red	48	1.0	52.2	43	1.0	50.0
Percent Cover:						
<i>Corynactis californica</i>		42.0	4.3		11.0	5.8
<i>Metridium senile</i>		38.5	89.1		29.5	87.2
Encruster, red		35.4	52.2		49.6	50.0
Turf		21.3	78.3		19.3	82.6
<i>Mytilus</i> spp.		21.0	21.7		35.0	23.3
<i>Leucetta losangelensis</i>		14.8	29.3		48.8	33.7
Encruster - yellow		13.1	14.1		16.0	8.1
Bare Metal		11.5	52.2		7.8	39.5

* - indicates dominant taxon (or physical characteristics) on one or both platform legs

Depth of distribution among the dominant taxa was also variable between the two platform legs. *Metridium senile* present on Leg B1 was evident across a broad depth range between 1 and 204 m (3 and 669 ft), with highest concentrations in 15 to 34 m (48 to 110 ft) water depths. On Leg B2, this species was similarly distributed, present between 1 and 187 m (4 and 612 ft), with highest concentrations in the 5 to 14 m (18 to 47 ft) depth range. By comparison, *Mytilus* spp. on Leg B1 was evident across a depth range between 1 and 14 m (3 and 46 ft); on Leg B2, this taxon exhibited a more restricted depth distribution, extending between 1 and 8 m (2 to 25 ft). The unidentified ophiuroid was present intermittently on Leg B1 between 9 and 191 m (29 and 625 ft) water depths. By contrast, its distribution on Leg B2 was also intermittent but more restricted, extending only between 1 and 119 m (4 and 390 ft).

A red encruster, a dominant on Platform Harvest, was present as a density and percent cover dominant on both legs. This species, unique to Platform Harvest and secondary platforms Hidalgo and Irene, exhibited a very broad depth distribution, occurring between 41 and 204 m (135 and 669 ft) on Leg B1 and between 44 and 187 m (145 and 612 ft) on Leg B2. When present, the red encruster covered an average of 35 to 50 percent of each photograph. Similarly, the sponge *Leucetta losangelensis* was also a percent cover dominant, with average coverage estimated at 15 and 47 percent for Legs B1 and B2, respectively.

Percent cover estimates of the other dominant taxa on Platform Harvest exhibited considerable variability between adjacent legs. Percent cover dominants and respective average cover on Leg B1 (exclusive of the red encruster) included *Metridium senile* (39 percent), *Metridium farcimen* (37 percent), turf (21 percent), and *Mytilus* spp. (11 percent). Although very limited in its presence on Leg B1, *Corynactis californica* was a percent cover dominant, occupying an average of 42 percent of the photographic image in water depths between 31 and 38 m (102 and 126 ft). On Leg B2, percent cover dominants and respective average cover (exclusive of the red encruster and *Leucetta losangelensis*) included *Mytilus* spp. (35 percent), *Metridium senile* (30 percent), and turf (19 percent). Other encrusters exhibited limited occurrence and variable percent cover contribution.

4.3.4 Platform Hidalgo

Legs A1 and B1 were sampled at Platform Hidalgo. Based on analysis of 141 photographs, 53 total taxa were identified, of which 37 percent (21) were monospecific taxa (i.e., species level identification). Only four floral taxa (i.e., foliose red algae; *Egredia*; filamentous red algae, including *Polysiphonia*, *Neoptilota*, *Antithamnion*: *Rhodymenia*) were among the 53 total taxa observed. One undifferentiated assemblage (turf) and two physical characteristics (bare metal, fishing line) were also observed. There was no indication that recent cleaning activity had occurred at Platform Hidalgo.

Based on density determinations, 26 taxa, plus turf and bare metal, were found to be common to both legs, while 10 taxa, plus an egg case, were unique to Leg A1 and 17 taxa were unique to Leg B1 (**Table 4-4**). Dominant taxa common to both legs included *Balanus nubilus*, *Balanus* spp., *Eudistylia polymorpha*, *Leucetta losangelensis*, *Metridium farcimen*, *Metridium senile*, *Mytilus* spp., an unidentified ophiuroid, *Tetraclita squamosa*, and calcareous worm tubes. Turf was also a predominant biological component present on both platform legs, while bare metal was a prominent physical characteristic on both legs.

Table 4-4. Comparison of taxa between Legs A1 and B1 of Platform Hidalgo based on the results of quantitative slide analysis.

<u>Common to Both Legs</u>				<u>Unique to Leg A1</u>			<u>Unique to Leg B1</u>		
<i>Balanus nubilus</i> *				<i>Mytilus</i> spp. *			<i>Anthopleura elegantissima</i> (rm) *		
<i>Balanus</i> spp. *				Ophiuroid, unidentified *			<i>Asterina miniata</i> (= <i>Patiria</i>)		
Bare Metal *				<i>Pisaster giganteus</i>			Bivalve, nestling		
Bryozoa, tan branching				<i>Pisaster ochraceus</i>			<i>Egorgia</i>		
Bryozoa, white branching				<i>Pollicipes polymerus</i>			Encruster - blue *		
Encruster - tan *				Sponge, tan encrusting *			Encruster - gray		
Encruster - white				Sponge, yellow encrusting			Encruster, green		
Encruster - yellow *				<i>Strongylocentrotus purpuratus</i>			Encruster, pink		
<i>Eudistylia polymorpha</i> *				<i>Stylasterias forreri</i>			Encruster, red *		
Foliose red algae				<i>Tetraclita squamosa</i> *			Line (fishing)		
<i>Leucetta losangelensis</i> *				Turf *			<i>Metridium</i> spp.		
<i>Leucilla nuttingi</i>				Worm tubes, calcareous *			<i>Ophiothrix spiculata</i> *		
<i>Metridium farcimen</i> *				Worm tubes, plain			<i>Orthasterias koehleri</i>		
<i>Metridium senile</i> *				Zoanthid, solitary tan			<i>Plumularia</i> spp.		
Comparison of co-occurring dominant taxa (or physical characteristics) on adjacent legs of Platform Hidalgo.									
Taxon	Total	Leg A1 Average per Occurrence	Frequency (%)	Total	Leg B1 Average per Occurrence	Frequency (%)	* - indicates dominant taxon (or physical characteristics) on one or both platform legs		
Density:									
<i>Metridium senile</i>	7,849	135.3	92.1	5,048	78.9	82.1			
Ophiuroid, unidentified	3,842	78.4	77.8	2,659	59.1	57.7			
<i>Mytilus</i> spp.	1,190	85.0	22.2	2,710	117.8	29.5			
<i>Balanus nubilus</i>	92	3.4	42.9	32	2.5	16.7			
<i>Metridium farcimen</i>	73	24.3	4.8	55	27.5	2.6			
Worm tubes, calcareous	47	2.9	25.4	49	2.6	24.4			
Turf	34	1.0	54.0	49	1.0	62.8			
<i>Leucetta losangelensis</i>	30	1.0	47.6	32	1.0	41.0			
Percent Cover:									
<i>Mytilus</i> spp.		57.1	22.2		54.2	29.5			
<i>Metridium senile</i>		46.7	92.1		34.9	82.1			
Encruster - yellow		30.0	3.2		12.1	12.8			
<i>Leucetta losangelensis</i>		25.3	47.6		30.5	41.0			
<i>Metridium farcimen</i>		21.7	4.8		17.5	2.6			
Bare Metal		18.5	27.0		39.0	10.3			
Turf		18.2	54.0		30.1	62.8			
Encruster - tan		17.3	23.8		10.4	7.7			
Sponge, tan encrusting		7.8	4.8		10.0	1.3			
							Tunicate, encrusting translucent		
							Zoanthid, colonial tan		

Several taxa were found on one leg of Platform Hidalgo but not on the other. Dominant taxa unique to Leg A1 included *Corynactis californica*. *Anthopleura elegantissima* (rosy morph) and *Ophiothrix spiculata* were identified as dominant taxa unique to Leg B1.

The top three density-dominant taxa common to both legs on Platform Hidalgo (i.e., *Metridium senile*, an unidentified ophiuroid, and *Mytilus* spp. on Leg A1; *Metridium senile*, *Mytilus* spp., and an unidentified ophiuroid on Leg B1) exhibited moderate between-leg variation in terms of total counts, average density per occurrence, and frequency of occurrence (see **Tables 3-9** and **3-10**). *Metridium senile* exhibited the highest density on Leg A1 and third highest density on Leg B1, occurring in 92 percent and 82 percent of the samples and averaging 135 and 79 individuals/0.0625 m² on Legs A1 and B1, respectively. On Leg A1, *Metridium senile* totaled 7,849 individuals, while on Leg B1 its total numbers decreased to 5,048 individuals, in conjunction with its reduced frequency. The unidentified ophiuroid occurred in 78 and 58 percent of the samples and averaged 78 and 59 individuals/0.0625 m² on Legs A1 and B1, respectively. *Mytilus* spp. exhibited the third and second highest total densities on Legs A1 and B1, respectively, occurring in 22 percent and 28 percent of the samples and averaging 85 and 118 individuals/0.0625 m², respectively. On Leg A1, *Mytilus* spp. totaled 1,190 individuals, while on Leg B1 its total numbers increased to 2,710 individuals.

Depth of distribution among the dominant taxa was also variable between the two platform legs. *Metridium senile* present on Leg A1 was evident across a broad depth range between 2 and 129 m (5 and 424 ft), with highest concentrations in 7 to 30 m (24 to 99 ft) water depths. On Leg B1, this species was similarly distributed, present between 0 and 122 m (0 and 399 ft), with highest concentrations in the 15 to 29 m (48 to 96 ft) depth range. By comparison, *Mytilus* spp. on Leg A1 was evident across a depth range between 1 and 9 m (3 and 29 ft); on Leg B1, this taxon exhibited a more restricted depth distribution, extending between 1 and 6 m (2 to 21 ft). The unidentified ophiuroid was present intermittently on Leg A1 between 2 and 131 m (5 and 430 ft) water depths. Its distribution on Leg B1 was also intermittent, extending between 1 and 128 m (4 and 421 ft).

Percent cover estimates of the dominant taxa on Platform Hidalgo exhibited moderate variability between adjacent legs. Percent cover dominants and respective average cover on Leg A1 included *Mytilus* spp. (57 percent), *Metridium senile* (46 percent), a yellow encruster (30 percent), and *Leucetta losangelensis* (25 percent). Turf and bare metal exhibited average cover of 18 percent each. *Corynactis californica* was a percent cover dominant on Leg A1, but only occupied an average of 9 percent of the photographic images in water depths between 24 and 31 m (78 and 101 ft). On Leg B1, percent cover dominants and respective average cover included *Mytilus* spp. (54 percent), *Anthopleura elegantissima* (rosy morph; 44 percent), *Metridium senile* (35 percent), *Leucetta losangelensis* (30 percent), and turf (30 percent). Bare metal averaged 39 percent coverage on Leg B1. Other encrusters exhibited limited occurrence and variable percent cover contribution.

4.3.5 Summary of Comparisons for Adjacent Platform Legs

Among the four primary platforms sampled, there were varying numbers of common and unique dominant and subdominant taxa present on adjacent legs. When the top 12 density-dominant taxa were considered, relatively high numbers of co-occurring dominants

were evident at platforms Harvest and Gail, followed by Hidalgo and Grace. In all cases, the numbers of dominant taxa unique to a particular platform leg ranged from zero to two, suggesting a relatively strong similarity in community composition between adjacent platform legs. Two taxa, *Metridium senile* and *Mytilus* spp., were noted numerical dominants on all of the primary platform legs. Other dominant taxa which were consistently common to adjacent platform legs included *Balanus* spp., *Ophiothrix spiculata* or unidentified ophiuroids, and calcareous worm tubes. Turf, representing an aggregation of smaller flora and fauna (including protozoa, hydrozoa, bryozoa, and algae) that co-occur with one another, was included among the density co-dominants on three of the four primary platforms, while bare metal co-occurred on all adjacent legs and was a dominant feature on platforms Harvest and Hidalgo.

In terms of percent cover, there were interesting differences evident between adjacent platform legs. On Platform Gail, *Corynactis californica*, *Metridium exilis*, and *Mytilus* spp. contributions to percent cover were significantly different between the legs sampled, while contributions from bare metal and *Metridium senile* increased accordingly. On Platform Grace, percent cover estimates of dominant taxa exhibited moderate variability between adjacent legs. Percent cover contributions from *Mytilus* spp. and filamentous red algae were comparable between the two legs sampled, while those from *Corynactis californica* and turf were considerably different. On Platform Harvest, percent cover dominants *Metridium senile* and turf generally exhibited similar contributions between legs, while significant variability was evident between legs for the red encruster, *Mytilus* spp., *Corynactis californica*, and *Leucetta losangelensis*. On Platform Hidalgo, moderate variability in percent cover dominants was evident between adjacent legs. Contributions from *Mytilus* spp., *Metridium farcimen*, and *Leucetta losangelensis* were similar between legs, while those from *Corynactis californica*, *Metridium senile*, and *Anthopleura elegantissima* (rosy morph) were noticeably different.

There were several other interesting observations which resulted from a comparison of adjacent legs. *Corynactis californica* and *Anthopleura elegantissima* (rosy morph) were present on the adjacent legs of several primary platforms, however, *Corynactis* was noticeably and completely absent from Leg B1 of Platform Hidalgo and *A. elegantissima* (rosy morph) was absent from Leg A1 of Platform Hidalgo and Leg B1 of Platform Gail.

4.4 Comparisons Between Platforms

4.4.1 Rank Order of Dominant Taxa

The rank order of dominant taxa identified at each platform provides a mechanism to compare taxa between platforms. Results presented previously in **Section 3** outlined dominant taxa (and physical characteristics, as appropriate) on the basis of density and percent cover (see **Tables 3-3** through **3-12**). These data have been used in the development of the following text and associated tables.

Table 4-5 identifies the ranking of dominant taxa (or physical characteristics) present on each platform leg, based on total individual counts (i.e., density). This table also indicates species presence as a sub-dominant (i.e., present, but not one of the top 12 taxa) or absence (i.e., not present), and denotes the relative frequency of occurrence of each taxa (i.e., as a dominant or sub-dominant).

Table 4-5. Summary of rankings for each of the top 12 taxa (based on density) identified during quantitative slide analysis, by platform leg. Physical characteristics have also been included, as appropriate.

Taxon	Gail A1	Gail B1	Grace C1	Grace C4	Harvest B1	Harvest B2	Hidalgo A1	Hidalgo B1	Habitat A1	Irene A1	Average Rank	Frequency (%)
<i>Metridium senile</i>	3	3	11	3	1	1	1	1	3	1	2.90	100
<i>Mytilus</i> spp.	6	4	3	2	3	4	3	2	2	9	3.80	100
<i>Balanus</i> spp.	9	8	5	5	6	6	SD	5	SD	4	6.00	100
Worm tubes, calcareous	SD	9	8	SD	8	10	7	8	SD	6	8.00	100
Turf	SD	SD	10	10	9	9	8	7	12	SD	9.29	100
Sponge, yellow encrusting	SD	SD	SD	SD	SD	SD	SD	SD	SD	11	11.00	100
Bare Metal	SD	SD	SD	SD	11	SD	12	SD	SD	ND	11.50	100
<i>Corynactis californica</i>	1	2	1	1	4	5	4	NP	1	7	2.89	90
<i>Balanus nubilus</i>	SD	SD	SD	11	SD	SD	5	11	5	NP	8.00	90
Ophiuroid, unidentified	10	SD	SD	SD	2	2	2	3	NP	NP	3.80	80
<i>Anthopleura elegantissima</i> (rosy morph)	8	NP	6	7	7	7	NP	4	6	5	6.25	80
<i>Ophiothrix spiculata</i>	5	7	4	4	NP	NP	NP	9	4	8	5.86	70
<i>Metridium farcimen</i>	11	NP	SD	9	SD	NP	6	6	NP	SD	8.00	70
Filamentous red algae	4	5	12	12	NP	8	NP	NP	SD	SD	8.20	70
<i>Leucetta/Leucetta losangelensis</i>	NP	SD	NP	SD	5	3	10	12	NP	NP	7.50	60
<i>Paracyathus stearnsii</i>	SD	SD	2	6	NP	SD	NP	NP	7	NP	5.00	60
Worm tubes, plain	12	11	NP	NP	SD	SD	SD	SD	NP	NP	11.50	60
<i>Pollicipes polymerus</i>	NP	NP	NP	NP	SD	12	SD	SD	NP	SD	12.00	50
<i>Eudistylia polymorpha</i>	SD	NP	NP	NP	NP	SD	9	SD	NP	NP	9.00	40
Encruster, red	NP	NP	NP	NP	12	11	NP	SD	NP	SD	11.50	40
<i>Pisaster ochraceus</i>	NP	NP	NP	NP	SD	NP	SD	SD	NP	12	12.00	40
<i>Metridium exilis</i>	2	1	NP	8	NP	NP	NP	NP	NP	NP	3.67	30
<i>Mytilus californianus</i>	NP	NP	7	NP	NP	NP	NP	NP	SD	2	4.50	30
<i>Tetraclita squamosa</i>	NP	NP	NP	NP	NP	NP	11	10	NP	3	8.00	30
<i>Coenocyathus bowersi</i> (c)	SD	NP	9	SD	NP	NP	NP	NP	NP	NP	9.00	30

Table 4-5. Summary of rankings for each of the top 12 taxa (based on density) identified during quantitative slide analysis, by platform leg. Physical characteristics have also been included, as appropriate (continued).

Taxon	Gail A1	Gail B1	Grace C1	Grace C4	Harvest B1	Harvest B2	Hidalgo A1	Hidalgo B1	Habitat A1	Irene A1	Average Rank	Frequency (%)
<i>Metridium</i> spp.	NP	NP	NP	NP	SD	NP	NP	SD	9	NP	9.00	30
Tunicate, encrusting translucent	NP	NP	NP	NP	10	SD	NP	SD	NP	NP	10.00	30
<i>Desmophyllum dianthus</i>	7	6	NP	NP	NP	NP	NP	NP	NP	NP	6.50	20
<i>Protula superba</i>	NP	10	NP	NP	NP	NP	NP	SD	NP	NP	10.00	20
<i>Triopha catalinae</i>	NP	NP	NP	NP	NP	NP	NP	NP	8	NP	8.00	10
<i>Anthopleura</i> spp. (whitish, no rose)	NP	NP	NP	NP	NP	NP	NP	NP	NP	10	10.00	10
<i>Corallina</i> spp.	NP	NP	NP	NP	NP	NP	NP	NP	10	NP	10.00	10
<i>Staurocalyptus</i> sp.	NP	NP	NP	NP	NP	NP	NP	NP	11	NP	11.00	10
<i>Amphipholis</i> spp.	NP	12	NP	NP	NP	NP	NP	NP	NP	NP	12.00	10

Notes: NP = not present; SD = sub-dominant.

Thirty-four numerically dominant species, taxa, undifferentiated assemblages, or physical characteristics were present on one or more of the six platforms evaluated. Two taxa, *Metridium senile* and *Mytilus* spp., were identified as numerical dominants on all ten platform legs evaluated. Three other taxa and one undifferentiated assemblage – *Balanus* spp., calcareous worm tubes, a yellow encrusting sponge, and turf – were either dominants or present (as sub-dominants) on all ten platform legs.

Turf, representing an undifferentiated aggregation of smaller flora and fauna (including protozoa, hydrozoa, bryozoa, and algae) that co-occur with one another, was included among the density dominants in spite of the fact that it was only assigned a numerical (i.e., density) value of one, indicative of its prevalence on many of the platforms. A similar approach was used with filamentous red algae, bare metal, red encruster, and the sponge *Leucetta losangelensis*. These taxa (or physical characteristics) were more appropriately characterized in terms of their relative contributions to percent cover, as discussed below.

One physical characteristic, bare metal, was also present on all ten platform legs evaluated. While bare metal estimates were not determined on Platform Irene, this characteristic was evident near the base of the platform. Bare metal was a prominent feature on single legs of platforms Harvest and Hidalgo (i.e., with a ranking of 11 and 12 on Legs B1 and A1, respectively; **Table 4-5**), and was a sub-dominant on all remaining platform legs.

Corynactis californica was present on nine of the ten legs as a dominant taxon, noticeably absent from Leg B1 of Platform Hidalgo. *Balanus nubilus* was either a dominant species or was present on nine of the platform legs sampled, being absent only from Platform Irene. It is noteworthy that in most instances where *Balanus nubilus* was a sub-dominant, barnacles (i.e., *Balanus* spp.) were present at a dominant component of the fauna. Other taxa present on a majority of the platform legs included unidentified ophiuroids, *Anthopleura elegantissima* (rosy morph) *Ophiothrix spiculata*, *Metridium farcimen*, filamentous red algae, *Leucetta/Leucetta losangelensis*, *Paracyathus stearnsii*, and plain worm tubes.

Seventeen of the 34 taxa or physical characteristics identified in **Table 4-5** occurred on 60 percent or more of the platform legs. Remaining taxa occurred on one or more of the six platforms, with considerable variability evident. For example, *Metridium exilis* and *Desmophyllum dianthus* at Platform Gail were among this platform's numerical dominants. *Metridium exilis* only occurred elsewhere on a single platform leg – Platform Grace, Leg C4. *Desmophyllum dianthus*, the sixth or seventh most abundant species (by density) at Platform Gail, was not encountered at any of the other platforms sampled. Similarly, three species – coralline alga (*Corallina* spp.), *Staurocalyptus* sp., and *Triopha catalinae* – were present only at Platform Habitat.

Other dominant or sub-dominant taxa that occurred exclusively at a limited number of platforms included:

- *Pollicipes polymerus* – present only at platforms Harvest, Hidalgo, and Irene
- Red encruster – present only at platforms Harvest, Hidalgo, and Irene
- *Pisaster ochraceus* – present only at platforms Harvest, Hidalgo, and Irene
- *Mytilus californianus* – present only at platforms Grace, Habitat, and Irene

- *Tetraclita squamosa* – present only at platforms Hidalgo and Irene
- *Coenocyathus bowersi* – present only at platforms Gail and Grace
- *Protula superba* – present only at platforms Gail and Hidalgo
- Coralline alga (*Corallina* spp.), *Staurocalyptus* sp., and *Triopha catalinae* – present only at Platform Habitat
- *Amphipholis* spp. – present only at Platform Grace

Species presence or absence may be influenced by platform location for several taxa. Several species were absent from platforms in the eastern Santa Barbara Channel (i.e., Grace, Gail), but nearly always present on those in the Santa Maria Basin (i.e., Harvest, Hidalgo, Irene), including the gooseneck barnacle *Pollicipes polymerus*, a red encruster, and the starfish *Pisaster ochraceus*. By comparison, several species were present on platforms in the eastern Santa Barbara Channel but were absent from the Santa Maria Basin, including *Coenocyathus bowersi* and *Amphipholis* spp. In other cases, several species exhibited limited distribution, with no apparent geographic affinities (e.g., *Protula superba*).

It is unclear as to why these species have not successfully colonized all platforms. Possible reasons for this phenomenon include the community composition of Santa Barbara Channel or Santa Maria Basin platforms (i.e., existing species' ability to preclude larval settlement), low larval planktonic concentrations of select species in certain areas, or an inability to survive following settlement (i.e., predation pressure), or a combination of these factors.

Table 4-6 identifies the ranking of dominant taxa, undifferentiated assemblages, and physical characteristics present on each platform leg, based on percent cover estimates. This table also indicates presence as a sub-dominant (i.e., present, but not one of the top 12 taxa) or absence (i.e., not present), and denotes the relative frequency of occurrence of each taxa (i.e., as a dominant or sub-dominant). In some cases, a percent cover estimate for a particular taxon could not easily be determined; those instances have been noted in **Table 4-6** and have been accounted for in the frequency total based on individual counts summarized in **Table 4-5**.

Forty-three dominant species, taxa, or physical characteristics resulted from the percent cover analysis. Five taxa, one undifferentiated assemblage, and one physical characteristic were present on all ten platform legs, based on percent cover estimates. *Mytilus* spp., *Metridium senile*, and turf were ranked as the top three contributors to percent cover at the six platforms characterized. *Mytilus* spp., with an average ranking of 2.78, was a major contributor to percent cover on nine of the ten legs evaluated. While percent cover estimates for *Mytilus* spp. were not determined on Platform Irene, *Mytilus californianus* was recognized as a dominant contributor to percent cover on Irene, indicating that mussels were percent cover dominants on all platform legs. *Metridium senile* and turf were percent cover dominants on all ten platform legs, averaging a rank of 3.33 and 7.00, respectively.

Calcareous worm tubes, tan encrusting sponge, and yellow encrusting sponge were also dominants or sub-dominants on all ten platform legs evaluated. Percent cover estimates for calcareous worm tubes were available only for one platform (Irene), although this taxon was present as a numerical dominant or sub-dominant on all of the remaining platforms (**Table 4-5**).

Table 4-6. Summary of rankings for each of the top 12 taxa (based on percent cover) identified during quantitative slide analysis, by platform leg. Physical characteristics have also been included, as appropriate.

Taxon	Gail A1	Gail B1	Grace C1	Grace C4	Harvest B1	Harvest B2	Hidalgo A1	Hidalgo B1	Habitat A1	Irene A1	Average	Frequency (%)
<i>Mytilus</i> spp.	2	6	1	2	7	3	1	1	2	ND	2.78	100
<i>Metridium senile</i>	3	3	SD	4	2	5	2	4	6	1	3.33	100
Turf	8	11	3	5	6	7	8	6	8	8	7.00	100
Bare Metal	4	2	12	11	12	12	7	3	SD	ND	7.88	100
Sponge, tan encrusting	10	7	11	12	SD	4	12	12	9	4	9.00	100
Sponge, yellow encrusting	12	SD	10	SD	SD	8	SD	SD	SD	11	10.25	100
Worm tubes, calcareous	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	6.00	100
<i>Corynactis californica</i>	1	5	2	1	1	10	11	NP	1	ND	4.00	90
Encruster, yellow	SD	SD	SD	SD	10	9	3	10	SD	NP	8.00	90
<i>Anthopleura elegantissima</i> (rosy morph)	5	NP	4	10	SD	11	NP	2	4	10	6.57	80
<i>Metridium farcimen</i>	ND	NP	ND	ND	3	NP	5	8	NP	ND	5.33	70
Filamentous red algae	ND	ND	6	7	NP	ND	NP	NP	5	ND	6.00	70
<i>Ophiothrix spiculata</i>	ND	ND	ND	ND	NP	NP	NP	ND	7	ND	7.00	70
Foliose red algae	NP	SD	SD	SD	11	SD	SD	SD	NP	NP	11.00	70
<i>Leucetta/Leucetta losangelensis</i>	NP	8-t	NP	SD	9	2	4	5	NP	NP	5.60	60
Encruster, tan	NP	SD	NP	NP	SD	6	9	11	SD	NP	8.67	60
Hydroid, tan branching	9	SD	9	SD	NP	NP	NP	NP	NP	SD	9.00	60
<i>Paracyathus stearnsii</i>	ND	ND	ND	ND	NP	ND	NP	NP	10	NP	10.00	60
Sponge, white encrusting	SD	SD	SD	SD	NP	SD	NP	NP	11	NP	11.00	60
Encruster, red	NP	NP	NP	NP	4	1	NP	7	NP	SD	4.00	40
Bryozoa, tan branching (c)	NP	NP	NP	NP	SD	SD	11	SD	NP	NP	11.00	40
<i>Tetraclita squamosa</i>	NP	NP	NP	NP	NP	NP	ND	ND	NP	3	3.00	30
<i>Metridium exilis</i>	6	1	NP	ND	NP	NP	NP	NP	NP	NP	3.50	30
<i>Mytilus californianus</i>	NP	NP	ND	NP	NP	NP	NP	NP	SD	5	5.00	30
Zoanthid, colonial tan	7	NP	NP	3	SD	NP	NP	NP	NP	NP	5.00	30

Table 4-6. Summary of rankings for each of the top 12 taxa (based on percent cover) identified during quantitative slide analysis, by platform leg. Physical characteristics have also been included, as appropriate (continued).

Taxon	Gail A1	Gail B1	Grace C1	Grace C4	Harvest B1	Harvest B2	Hidalgo A1	Hidalgo B1	Habitat A1	Irene A1	Average	Frequency (%)
Sponge, cup tan	SD	10	NP	SD	NP	NP	NP	NP	NP	NP	10.00	30
Zoanthid, tan (<i>Palythoa</i>)	NP	12	NP	NP	NP	NP	ND	ND	NP	NP	12.00	30
Sponge, orange encrusting	12	SD	SD	NP	NP	NP	NP	NP	NP	NP	12.00	30
Zoanthid (<i>Palythoa</i>)	NP	SD	NP	NP	NP	NP	NP	NP	3	NP	3.00	20
Hydroid, tan	NP	NP	5	6	NP	NP	NP	NP	NP	NP	5.50	20
Sponge, tan foliose	NP	NP	NP	SD	NP	NP	6	NP	NP	NP	6.00	20
Tunicate, encrusting tan	11	NP	NP	NP	NP	NP	NP	NP	NP	2	6.50	20
Sponge, gray encrusting	NP	NP	8	NP	NP	NP	NP	NP	NP	7	7.50	20
Encruster, lavender	NP	NP	NP	NP	5	NP	10	NP	NP	NP	7.50	20
Encruster, blue	NP	NP	SD	NP	NP	NP	NP	9	NP	NP	9.00	20
Alga, encrusting green	NP	NP	NP	NP	NP	NP	SD	NP	NP	9	9.00	20
<i>Ulva</i> spp.	NP	NP	NP	ND	NP	NP	NP	NP	12	12	12.00	20
<i>Halichondria panicea</i>	NP	4	NP	NP	NP	NP	NP	NP	NP	NP	4.00	10
Bryozoa turf	NP	NP	7	NP	NP	NP	NP	NP	NP	NP	7.00	10
<i>Cliona</i> spp., yellow	NP	NP	NP	8-t	NP	NP	NP	NP	NP	NP	8.00	10
<i>Botrylloides</i> spp.	NP	NP	NP	NP	8	NP	NP	NP	NP	NP	8.00	10
Sponge, tan globose	NP	8-t	NP	NP	NP	NP	NP	NP	NP	NP	8.00	10
Anthozoa, unidentified	NP	NP	NP	8-t	NP	NP	NP	NP	NP	NP	8.00	10

Notes: NP = not present; ND = not determined but present, based on density estimates (Table 4-5); SD = sub-dominant; -t = average percent cover estimates for two taxa were identical; respective rankings reflect this fact.

Bare metal was also a percent cover dominant or sub-dominant as a physical characteristic on nine of the ten platform legs evaluated. Bare metal was present to a very limited extent, and subsequently was not assessed, on Leg A1 of Platform Irene.

Corynactis californica was a percent cover dominant or sub-dominant on eight legs and present (but coverage not determined) on another leg, for a total of nine platform legs. *Corynactis* was absent on Platform Hidalgo, Leg B1, and not determined on Platform Irene. *Anthopleura elegantissima* (rosy morph) was present as a dominant or sub-dominant on eight legs; this species was absent on Platform Gail, Leg B1 and Platform Hidalgo, Leg A1. Other taxa which were contributors to percent cover on a majority of the platform legs included a yellow encruster, *Metridium farcimen*, *Ophiothrix spiculata*, filamentous red algae, foliose red algae, *Leucetta/Leucetta losangelensis*, a tan encruster, a tan branching hydroid, *Paracyathus stearnsii*, and a white encrusting sponge (**Table 4-6**).

The remaining taxa identified in **Table 4-6** contributed to percent cover in varying degrees at one or more of the six platforms, with considerable variability evident as was noted previously during the discussion of density dominant taxa. Similar trends regarding geographic distribution were noted in the percent cover estimates, although the species identified differed slightly:

- Red encruster – present only at platforms Harvest, Hidalgo, and Irene
- Bryozoa, tan branching – present only at platforms Harvest and Hidalgo
- *Tetraclita squamosa* – present only at platforms Hidalgo and Irene
- *Metridium exilis* – present only at platforms Gail and Grace
- Colonial tan zoanthid – present only (on single legs) at platforms Gail, Grace, and Harvest
- Cup tan sponge – present only at platforms Gail and Grace
- Orange encrusting sponge – present only at platforms Gail and Grace
- Gray encrusting sponge – present only at platforms Grace and Irene
- Lavender encruster – present only at platforms Harvest and Hidalgo

As noted previously, platform location may influence presence or absence for several taxa identified during either density or percent cover analyses. When considering percent cover results, several species absent from platforms in the eastern Santa Barbara Channel were present in the Santa Maria Basin – red encruster, tan branching bryozoa, *Tetraclita squamosa*, and lavender encruster. Several species present on platforms in the eastern Santa Barbara Channel were absent from the Santa Maria Basin – *Metridium exilis*, cup tan sponge, and orange encrusting sponge. Several species exhibited limited distribution with no apparent geographic affinities (e.g., gray encrusting sponge, colonial tan zoanthid). Insufficient information exists as why some species have successfully colonized all platforms while others have not.

Combining dominant taxa from both density and percent cover determinations into a composite listing produced 60 taxa, undifferentiated assemblages (i.e., turf, bryozoa turf), and physical characteristics (e.g., bare metal), as outlined in **Table 4-7**. Table entries are grouped by frequency of occurrence, then in ascending order (i.e., highest average rank first).

Table 4-7. Comparison of average rankings - density vs. percent cover - for the dominant taxa, all platforms.

Taxon	Density	Percent Cover	Frequency (%)	Taxon	Density	Percent Cover	Frequency (%)
<i>Metridium senile</i>	2.90	3.33	100	Zoanthid, colonial tan	ND	5.00	30
<i>Mytilus</i> spp.	3.80	2.78	100	<i>Tetraclita squamosa</i>	8.00	3.00	30
<i>Balanus</i> spp.	6.00	ND	100	<i>Coenocyathus bowersi</i>	9.00	ND	30
Worm tubes, calcareous	8.00	6.00	100	<i>Metridium</i> spp.	9.00	ND	30
Turf	9.29	7.00	100	Tunicate, encrusting translucent	10.00	ND	30
Sponge, tan encrusting	ND	9.00	100	Sponge, cup tan	ND	10.00	30
Bare Metal	11.50	7.88	100	Zoanthid, tan (<i>Palythoa</i>)	ND	12.00	30
Sponge, yellow encrusting	11.00	10.25	100	Sponge, orange encrusting	ND	12.00	30
<i>Corynactis californica</i>	2.89	4.00	90	<i>Desmophyllum dianthus</i>	6.50	ND	20
Ophiuroid, unidentified	3.80	ND	90	<i>Protula superba</i>	10.00	ND	20
<i>Balanus nubilus</i>	8.00	ND	90	Zoanthid (<i>Palythoa</i>)	ND	3.00	20
Encruster, yellow	ND	8.00	90	Hydroid, tan	ND	5.50	20
<i>Anthopleura elegantissima</i> (rm)	6.25	6.57	80	Sponge, tan foliose	ND	6.00	20
<i>Ophiothrix spiculata</i>	5.86	7.00	70	Tunicate, tan encrusting	ND	6.50	20
<i>Metridium farcimen</i>	8.00	5.33	70	Sponge, gray encrusting	ND	7.50	20
Filamentous red algae	8.20	6.00	70	Encruster, lavender	ND	7.50	20
Foliose red algae	ND	11.00	70	Encruster, blue	ND	9.00	20
<i>Leucetta/Leucetta losangelensis</i>	7.50	5.60	60	Alga, encrusting green	ND	9.00	20
Encruster, tan	ND	8.67	60	<i>Ulva</i> spp.	ND	12.00	20
Hydroid, tan branching	ND	9.00	60	<i>Halichondria panicea</i>	ND	4.00	10
<i>Paracyathus stearnsii</i>	5.00	10.00	60	Bryozoa turf	ND	7.00	10
Sponge, white encrusting	ND	11.00	60	<i>Cliona</i> spp., yellow	ND	8.00	10
Worm tubes, plain	11.50	ND	60	<i>Triopha catalinae</i>	8.00	ND	10
<i>Pollicipes polymerus</i>	12.00	ND	50	<i>Botrylloides</i> spp.	ND	8.00	10
<i>Eudistylia polymorpha</i>	9.00	ND	40	Sponge, tan globose	ND	9.00	10
Encruster, red	11.50	4.00	40	Anthozoa, unidentified	ND	9.00	10
<i>Pisaster ochraceus</i>	12.00	ND	40	<i>Anthopleura</i> spp. (whitish, no rose)	10.00	ND	10
Bryozoa, tan branching	ND	11.00	40	<i>Corallina</i> spp.	10.00	ND	10
<i>Metridium exilis</i>	3.67	3.50	30	<i>Staurocalyptus</i> sp.	11.00	ND	10
<i>Mytilus californianus</i>	4.50	5.00	30	<i>Amphipholis</i> spp.	12.00	ND	10

Note: ND = not determined; rm = rosy morph.

For many of the taxa, the average density and average percent cover rank determinations were comparable, particularly for the most frequently observed species (e.g., *Metridium senile* – 2.90 vs. 3.33; *Mytilus* spp. – 3.80 vs. 2.78; calcareous worm tubes – 8.00 vs. 6.00; *Corynactis californica* – 2.89 vs. 4.00; *Anthopleura elegantissima* [rosy morph] – 6.25 vs. 6.57). Other dominant taxa present at all six platforms included *Balanus* spp. and a tan encrusting sponge, although these determinations resulted from either individual counts or percent cover estimations only. Comparability of average rankings underscores the fact that these species were not only present at all of the platforms, but present as dominant taxa in terms of individual counts and/or percent cover.

Individual counts and percent cover estimators are viable mechanisms, both separately and jointly, in determining relative importance of a species to platform community structure. Sixteen taxa and undifferentiated assemblages, and a single physical characteristic, were characterized in terms of both counts and percent cover and included the vast majority of dominant taxa. For most entities (i.e., turf, bare metal, colonial and/or encrusting species, algal species), the relative contribution to community structure is best evaluated on the basis of percent cover determinations. Percent cover estimations do not suffer from the inherent limitations associated with enumerating colonial or algal taxa (e.g., proper determination of the number of individuals in a colony is problematic). Further, the mechanism used in the present analysis to determine individual counts (i.e., assignment of the number “1”) underestimates the relative contribution of these forms. Individual counts (i.e., density) are appropriate for readily identifiable individuals and as one means of estimating the relative contribution of a given taxon to platform community structure.

Additional observations noted in the comparison of average rankings for dominant platform taxa. Forty percent of the dominant taxa occurred on 50 percent or more of the platform legs. For species with lower frequencies of occurrence, platform location may be an important factor (i.e., indicative of taxa unique to either eastern Santa Barbara Channel or Santa Maria Basin platforms).

4.4.2 Density Comparisons

Among the numerically dominant (i.e., density-dominant) taxa, cnidarians (i.e., *Metridium senile*, *Anthopleura elegantissima* [rosy morph], *Corynactis californica*), mussels (i.e., *Mytilus californianus*; *Mytilus* spp. complex), barnacles (i.e., *Balanus nubilus*, *Balanus* spp., *Tetraclita squamosa*), worm tubes (calcareous and plain), and ophiuroids (*Ophiothrix spiculata*; ophiuroids, unidentified) represented the most prominent and consistent community-formers present on the platforms studied. Minimum, maximum, and average density determinations for several of these density-dominant taxa are provided in **Table 4-8** and discussed below.

Metridium senile was the highest ranked species observed overall – the numerical (density) dominant of platforms Harvest, Hidalgo, and Irene, and ranking within the top four at platforms Gail, Grace, and Habitat. Its lowest ranking occurred on Leg C1 of Platform Grace (see **Table 4-5**). Maximum densities of *M. senile* ranged from 60 to 510 individuals/0.0625 m², with highest density seen at Platform Irene (**Table 4-8**). Average density was highest at Platform Irene and lowest at Platform Habitat. This species exhibited a wide depth distribution and was found at nearly all depths of a platform.

Table 4-8. Minimum, maximum, and average densities ¹ of select dominant taxa (based on numerical abundance) by platform.

Species or Taxon	Gail		Grace		Harvest		Hidalgo		Habitat		Irene	
	Average	Min-Max	Average	Min-Max	Average	Min-Max	Average	Min-Max	Average	Min-Max	Average	Min-Max
<i>Metridium senile</i>	38.8-60.4	1-213	10.8-43.1	1-165	29.5-38.6	1-90	78.9-135.3	1-275	22.8	1-60	330.9	15-510
<i>Mytilus</i> spp./ <i>Mytilus californianus</i>	24.3-35.5	2-160	76.0-79.8	4-240	36.7-40.9	1-110	85.0-117.8	5-220	32.6	3-80	42.5	4-124
<i>Balanus</i> spp./ <i>Balanus nubilus</i> / <i>Tetraclita squamosa</i>	9.1-9.5	1-30	24.9-27.3	1-100	4.2-5.9	1-27	2.5-5.4	1-25	12.7	1-64	10.0-42.0	7-200
Worm tubes, plain and calcareous	5.6-11.3	1-27	1.0-4.7	1-10	2.8-3.5	1-12	2.6-2.9	1-8	1.0	1	51.5	3-100
<i>Corynactis californica</i>	159.7-448.9	1-693	211.9-344.2	1-500	35.8-168.0	4-360	27.8	9-75	448.5	12-700	10.1	1-33
<i>Anthopleura elegantissima</i> (rosy morph)	20.3	1-100	13.6-25.9	1-62	7.8-9.4	1-24	84.9	2-185	19.6	1-75	10.8	1-25
<i>Ophiothrix spiculata</i> / Ophiuroid, unidentified	15.8-24.2	1-66	26.7-46.9	1-180	23.0-44.7	1-180	57.7-78.4	1-430	14.4	1-73	4.0	2-7
<i>Metridium farcimen</i>	11.4	1-88	1.0-6.5	1-18	4.4	3-8	24.3-27.5	19-42	-	-	12.0	12
Filamentous red algae	11.1-27.9	1-70	1.0	1	21.4	2-40	-	-	1.0	1	1.0	1
<i>Leucetta/Leucetta losangelensis</i>	1.0 ²	1	1.0	1	13.1-50.8	1-80	1.0	1	-	-	-	-
<i>Paracyathus stearnsii</i>	4.0-9.0	1-12	26.8-71.9	1-201	1.0	1	-	-	20.7	1-53	-	-
Red encruster	-	-	-	-	1.0	1	1.0	1	-	-	1.0	1
<i>Metridium exilis</i>	146.9-340.0	2-580	32.3	15-60	-	-	-	-	-	-	-	-

1 Minimum, maximum, and average number of individuals/0.0625 m², as presented in Tables 3-3 through 3-12 and Appendix C. Average density values for taxa from the primary platforms (Gail, Grace, Harvest, Hidalgo) are provided as a range, reflecting averages representative of each leg. For example, for *Mytilus* spp./*Mytilus californianus* at Platform Gail, average density values of 35.5 and 24.3 individuals/0.0625 m² were calculated for Leg A1 and B1, respectively. Solitary average density values are for taxa from secondary platforms or for dominant species/taxa which only occurred on one leg of a primary platform.

2 The occurrence of several colonial or algal taxa were either counted or denoted using the number “1” to indicate their presence (e.g., *Leucetta/Leucetta losangelensis*, red encruster); please refer to Table 4-9 for a summary of percent cover for these taxa.

Mytilus spp. was the second highest ranked species observed and the most prominent taxon between the intertidal and the upper few tens of meters of a platform leg. *Mytilus* spp. or *Mytilus californianus* consistently ranked in the top six density dominants, and usually was the second or third most abundant taxa (by density) at the platforms sampled. At Platform Grace, where it exhibited the highest density levels among the platforms, maximum densities reached 240 individuals/0.0625 m², or approximately 3,840 individuals/m². At the other platforms, maximum mussel densities ranged from 80 to 220 individuals/0.0625 m² (**Table 4-8**). This species exhibited highest average density at Platform Hidalgo and lowest average density at Platform Gail.

The vertical extent of the mussel zone was limited and variable between the platforms sampled. The deepest mussel occurrence was noted at platforms Irene and Habitat, where *Mytilus* was noted to approximately 24 m (79 and 78 ft, respectively). The shallowest distribution of mussels (i.e., shallowest lower end of the mussel zone) was encountered at Platform Hidalgo, where *Mytilus* was present to only 9 m (29 ft). The lower extent of the mussel zone at the remaining platforms ranged from 11 to 14 m (35 to 46 ft). In spite of its relatively narrow depth of occurrence and variable vertical extent, mussels were consistently found among the numerically dominant taxa at all platforms. Further, mussel beds also provide a complex, three-dimensional environment for a myriad of interstitial fauna and epibionts (e.g., caprellid and gammarid amphipods, crabs, pycnogonids, brittle stars, holothuroids, gastropods, bivalves, nudibranchs, chitons, polychaetes, anemones, hydroids, hydrozoans, nemertean, sponges, bryozoans, tunicates, sipunculids, and flatworms). This complex interstitial and epibiont space provides habitat, food, and protection for many species.

Barnacles, represented by *Balanus* spp., *Balanus nubilus*, and, to a lesser extent by *Tetraclita squamosa*, ranked third in total density among platform-associated taxa. The maximum barnacle density of 200 individuals/0.0625 m² was observed at Platform Irene, while lowest maximum density of 23 individuals/0.0625 m² was evident at Platform Hidalgo (**Table 4-8**). Maximum barnacle densities noted at platforms Grace and Habitat were 100 and 64 individuals/0.0625 m², respectively. Highest average density of barnacles was observed at Platform Irene, while lowest average densities were evident at Platform Hidalgo. The predominant depth range for barnacles was within the upper portions of the platform leg (i.e., usually from the intertidal to approximately 18 m [60 ft]), although barnacles were found extending down a platform's leg at Grace, Harvest, Hidalgo, Habitat, and Irene.

Worm tubes, including both calcareous and plain forms, jointly ranked fourth in total density among platform-associated taxa. The maximum worm tube density of 100 individuals/0.0625 m² was observed at Platform Irene, while lowest maximum density of 1 individual/0.0625 m² was evident at Platform Habitat (**Table 4-8**). Highest average density of worm tubes was observed at Platform Irene, while lowest average densities were evident at Platform Habitat. The predominant depth range for worm tubes, whether calcareous or plain, was below approximately 46 m (150 ft), with specimens evident in photographs at 100 m (328 ft) or more. Maximum depth of occurrence for worm tubes was 213 m (700 ft).

The anthozoan anemones *Corynactis californica* and *Anthopleura elegantissima* ranked seventh and tenth in total density among density-dominant species, respectively (see **Tables 4-5** and **4-8**). Maximum density of *Corynactis californica* ranged from a minimum of 33 individuals

to a maximum of 700 individuals/0.0625 m², with highest densities noted at platforms Habitat, Grace, and Gail (where this species ranked first or second in total density). Highest average densities of *Corynactis* were observed at platforms Gail and Habitat, while lowest average densities were evident at platforms Irene, Hidalgo, and Harvest, perhaps highlighting a difference between Santa Barbara Channel and Santa Maria Basin platforms. This species has a rather broad depth distribution, typically between approximately 15 and 61 m (50 and 200 ft), although *Corynactis* was observed at deeper depths (e.g., >91 m [300 ft] at Platform Gail; >61 m [200 ft] at Platform Habitat).

Maximum density of the rosy morph form of *Anthopleura elegantissima* ranged from 24 to 185 individuals/0.0625 m², with highest densities evident at Platform Hidalgo (where it ranked fourth and fifth in total density; see **Table 4-5**). Highest average densities of *Anthopleura* were observed at Platform Hidalgo, while lowest average densities were evident at platforms Harvest and Irene. In contrast to *Metridium senile*, *Anthopleura elegantissima* (rosy morph) exhibited a very restricted depth range, occurring primarily in the upper 1 to 14 m (3 to 45 ft) of each submerged platform leg (i.e., with the intertidal, barnacle, and *Mytilus* zones).

Ophiuroids, as represented by *Ophiothrix spiculata* or unidentified ophiuroids, were also prevalent on the platforms and were ranked seventh in total density among the dominant species. Ophiuroid dominance at each platform varied, ranging in density-based ranking from second to tenth (see **Table 4-5**). Ophiuroids had the second highest total abundance among taxa on both legs of Platform Harvest and a single leg of Platform Hidalgo. Maximum densities of ophiuroids ranged from 7 to 430 individuals/0.0625 m². Highest ophiuroid densities were noted at Platform Hidalgo, with significantly lower maximum densities at platforms Harvest and Grace; lowest maximum ophiuroid densities were evident at platforms Irene, Gail, and Habitat. Highest average densities of *Ophiothrix spiculata* or unidentified ophiuroids were observed at Platform Hidalgo, while lowest average densities were evident at platforms Irene, Habitat, and Gail. Ophiuroids exhibited a wide depth distribution and were found at nearly all depths of a platform, in similar fashion to *Metridium senile*.

Several other density-dominant taxa were identified including:

- *Metridium farcimen* – sixth highest density at Platform Hidalgo (maximum density: 42 individuals/0.0625 m²), also relatively high total density-dominant at platforms Grace and Gail, with minor contributions at Platform Harvest;
- Filamentous red algae – fourth and fifth highest total density at Platform Gail, eighth highest total density on a single leg at Platform Harvest, and twelfth highest total density at Platform Grace;
- *Leucetta/Leucetta losangelensis* – third and fifth highest total density at Platform Harvest, and tenth and twelfth highest total density at Platform Hidalgo;
- *Paracyathus stearnsii* – second and sixth highest total density at Platform Grace (maximum density: 201 individuals/0.0625 m²), and seventh highest total density at Platform Habitat.
- Red encruster – eleventh and twelfth highest total density at Platform Harvest, and a sub-dominant taxa at platforms Hidalgo and Irene.

- *Metridium exilis* – highest and second highest total density at Platform Gail, and the eighth highest density-dominant at Platform Grace; this species was not encountered at any of the remaining platforms.

Several of these colonial or algal taxa were either counted or their presence noted (by assigning the number “1”), including filamentous red algae, *Leucetta/Leucetta losangelensis*, and red encruster. In spite of their low totals when counted, these taxa occurred in a relatively high number of photographs and, thus, were recognized as density-dominants. A more representative evaluation of their contribution to platform-associated communities is found in the following discussion of percent cover.

4.4.3 Percent Cover Comparisons

Several of the density-dominant taxa were also noted as significant fauna elements when percent cover was determined. The major taxa, undifferentiated assemblages, or physical characteristics evaluated for percent cover (i.e., coverage-dominant) included cnidarians (i.e., *Metridium senile*, *Anthopleura elegantissima* [rosy morph], *Corynactis californica*; *Metridium farcimen*), mussels (i.e., *Mytilus californianus*; *Mytilus* spp. complex), turf, calcareous worm tubes, sponges (tan encrusting, yellow encrusting, *Leucetta/Leucetta losangelensis*), bare metal, encrusters (yellow), ophiuroids (*Ophiothrix spiculata*), and algae (filamentous red algae, foliose red algae). These taxa represented the most prominent and consistent community-formers present on the platforms studied. Minimum, maximum, and average percent cover determinations for several of the dominant taxa are provided in **Table 4-9**.

At Platform Gail, major contributors to percent cover included *Corynactis californica*, *Mytilus* spp., *Metridium senile*, and bare metal, with minor contributions from *Anthopleura elegantissima* (rosy morph), tan encrusting sponge, and turf. At Platform Grace, major contributors included *Corynactis californica*, *Mytilus* spp., turf, *Metridium senile*, *Anthopleura elegantissima* (rosy morph), with contributions from filamentous red algae, yellow and tan encrusting sponges, and bare metal.

At Platform Harvest, major contributors to percent cover included red encruster, *Leucetta/Leucetta losangelensis*, *Corynactis californica*, *Metridium senile*, *Mytilus* spp., a tan encrusting sponge, and *Metridium farcimen*, with contributions from turf, a yellow encrusting sponge, and a yellow encruster. At Platform Hidalgo, major contributors included *Mytilus* spp., *Metridium senile*, *Anthopleura elegantissima* (rosy morph), and bare metal; lower contributions to percent cover were attributed to *Leucetta losangelensis*, turf, and a yellow encruster.

At Platform Habitat, major contributors to percent cover included *Corynactis californica*, *Mytilus* spp., *Anthopleura elegantissima* (rosy morph), and filamentous red algae, with minor contributions from *Ophiothrix spiculata*, *Metridium senile*, and turf. At Platform Irene, major contributors included *Metridium senile*, a tan encrusting sponge, *Mytilus californianus/Mytilus* spp., and calcareous worm tubes, with minor contributions from turf, *Anthopleura elegantissima* (rosy morph), a yellow encrusting sponge, and a red encruster.

Table 4-9. Minimum, maximum, and average coverage ¹ of select dominant taxa (based on percent cover) by platform.

Species or Taxon	Gail		Grace		Harvest		Hidalgo		Habitat		Irene	
	Average	Min-Max	Average	Min-Max	Average	Min-Max	Average	Min-Max	Average	Min-Max	Average	Min-Max
<i>Metridium senile</i>	31.8-41.7	1-95	3.7-36.6	0.5-80	29.5-38.5	1-90	34.9-46.7	0.5-98	11.5	0.5-30	66.0	3-90
<i>Mytilus</i> spp./ <i>Mytilus californianus</i>	19.2-60.4	5-90	49.1-52.6	5-85	21.0-35.0	5-90	54.2-57.1	3-85	40.6	4-100	29.5	2-85
Sponge, yellow encrusting	1.2-3.5	0.5-20	3.5-11.3	0.5-30	5.3-16.1	1-70	0.5-3.0	0.5-3	0.6	0.5-1	3.3	0.1-15
Sponge, tan encrusting	4.0-10.5	0.5-50	6.6-9.8	1-50	7.5-30.0	5-30	7.8-10.0	0.5-20	7.9	1-40	32.4	1-60
Turf	6.0-8.4	0.4-30	25.6-37.4	1-97	19.3-21.3	0.5-75	18.2-30.1	0.5-80	10.5	0.5-95	10.2	1-25
Bare Metal	33.3-49.2	2-85	7.5-8.4	2-15	7.8-11.5	0.5-50	18.5-39.0	0.5-65	1.0	1	NP	NP
<i>Corynactis californica</i>	22.8-64.0	0.5-98	42.6-69.2	0.5-100	11.0-42.0	1-90	9.0	2-25	73.5	1-100	ND	ND
<i>Anthopleura elegantissima</i> (rosy morph)	26.4	0.5-100	8.7-30.8	0.5-90	6.3-8.9	1-20	43.5	1-95	23.0	1-95	3.9	0.5-10
Filamentous red algae	ND	ND	16.7-21.2	0.5-50	ND	ND	NP	NP	22.6	1-50	ND	ND
Foliose red algae	1.7	1-2	1.2-3.0	0.5-5	5.6-12.2	0.5-30	1.4-2.2	0.5-10	NP	NP	NP	NP
<i>Leucetta/Leucetta losangelensis</i>	10.0	10	6.2	1-20	14.8-48.8	1-80	25.3-30.5	2-80	NP	NP	NP	NP
Red encruster	NP	NP	NP	NP	35.4-49.6	2-90	22.4	5-70	NP	NP	1.0	1
<i>Metridium exilis</i>	23.0-62.0	1-95	ND	ND	NP	NP	NP	NP	NP	NP	NP	NP
Encruster, yellow	0.5-0.75	0.5-1	0.8-1.8	0.5-3	13.1-16.0	0.5-70	12.1-30.0	0.5-50	0.5	0.5	NP	NP
<i>Metridium farcimen</i>	ND	ND	ND	ND	37.0	15-100	17.5-21.7	10-35	NP	NP	ND	ND
<i>Ophiothrix spiculata</i>	ND	ND	ND	ND	ND	ND	ND	ND	10.8	1-60	ND	ND
Worm tubes, calcareous	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25.5	1-50

¹ Minimum, maximum, and average percent cover/0.0625 m², as presented in Tables 3-3 through 3-12 and Appendix C. Average percent cover values of taxa from the primary platforms (Gail, Grace, Harvest, Hidalgo) are provided as a range, reflecting averages representative of each leg. For example, for *Mytilus* spp./*Mytilus californianus* at Platform Gail, average percent cover values of 60.4 and 19.2 percent/0.0625 m² were calculated for Leg A1 and B1, respectively. Solitary average percent cover values are for taxa from the secondary platforms or for dominant species/taxa which only occurred on one leg of a primary platform.

Notes: ND = present but not determined; NP = not present.

Percent cover contributions were frequently variable between platform legs and between platforms. Average percent cover estimates, by taxa, ranged from less than one percent to >60 percent. Several species exhibited minimum-maximum coverage estimates which ranged from 0.5 to 90 or 100 percent, including the major community formers (e.g., *Mytilus*, *Corynactis*, and, to a lesser extent, *Anthopleura*) (**Table 4-9**). Other species did not exhibit high percent cover estimates, but were important community formers along the mid- and lower portions of the platform (e.g., *Leucetta*, tan encrusting sponge), underscoring the importance of species presence at depth and species-specific depth distribution in the characterization of platform-associated communities.

4.4.4 Comparison of Percent Cover Data: PointCount'99® vs. QSA

Eighty-one percent of the taxa identified during point count analyses (PointCount'99®) were also identified as percent cover dominants during whole or quantitative slide analysis (QSA). **Table 4-10** lists the 12 dominant taxa and associated characteristics, as determined from point count analyses; data include minimum and maximum percent cover, average percent cover, and frequency of occurrence. Similarly, this table also provides data for percent cover dominants determined during QSA (i.e., as derived from **Tables 3-3** through **3-12**), as well as whether those taxa identified during point contact analyses were also QSA percent cover dominants.

Taxa presented and ranked in **Table 4-10** were based on average percent cover, in descending order. For example, *Corynactis californica* exhibited the highest average percent cover on Platform Gail, Leg A1 in terms of both point count and QSA rankings. Overall, rankings of QSA percent cover dominants were very consistent with PointCount'99® results. Strong similarities and a few inconsistencies were evident in a comparison of minimum and maximum values, average percent cover estimates, and frequency determinations, as presented in **Table 4-10**. Typically, the top dominants on each platform leg were noted accordingly, although shuffling of position between top dominants was evident. Such reshuffling of dominant taxa was not unexpected, given the differences between comparison parameters (i.e., 50 random points vs. whole slide analysis).

At least one species of interest was potentially under represented in the point count approach - mussels. *Mytilus* spp. on Platform Gail ranked sixth in the point count results with an average of 24.9 percent cover; QSA results were considered more representative, ranking *Mytilus* spp. second overall with an average of 60.4 percent cover. Under representation was also evident at Platform Grace (Legs C1 and C4) and Hidalgo (Legs A1 and B1), and, to a lesser extent, at Platform Harvest (Leg B2). At the other platforms, *Mytilus* coverage estimates were comparable between the two data sets. Under representation was not evident with other dominant taxa. For example, *Metridium senile* and *Anthopleura elegantissima* (rosy morph) coverage was, in general, comparable between point count and QSA determinations.

In several instances, bare metal was noted as a dominant contributor to percent cover during QSA. Because this physical characteristic was not documented during PointCount'99® analyses, no direct comparisons between point count and QSA data sets were available for this characteristic.

Table 4-10. Comparison of dominant taxa on the six platforms - PointCount'99® vs. QSA - based on percent cover estimates.

Platform and Leg	Taxa	PointCount'99®			QSA			
		Average Percent Cover	Minimum-Maximum	Frequency (%)	D-R	Average Percent Cover	Minimum-Maximum	Frequency (%)
Platform Gail:								
Leg A1	<i>Corynactis californica</i>	62.4	2-100	34.2	Y (1)	64.0	1-98	34.7
	<i>Metridium senile</i>	37.6	2-94	60.4	Y (3)	41.7	1-95	71.4
	<i>Desmophyllum dianthus</i>	30.6	2-60	15.3	Y (D)	ND	ND	19.4
	<i>Anthopleura elegantissima</i> (rm)	29.7	2-100	11.7	Y (5)	26.4	0.5-100	15.3
	Red Algae	29.2	4-66	23.4	Y (D)	ND	ND	27.6
	<i>Mytilus</i> spp.	24.9	2-48	12.6	Y (2)	60.4	5-90	14.3
	Zoanthidea	23.4	6-84	6.3	Y (7)	10.0	5-15	2.0
	<i>Metridium farcimen</i>	20.4	2-68	4.5	Y (D)	ND	ND	9.2
	Turf	19.7	2-70	74.8	Y (8)	6.0	0.4-25	35.7
	<i>Metridium exilis</i>	17.8	2-60	27.0	Y (6)	23.0	1-80	31.6
	<i>Ophiothrix spiculata</i>	8.5	2-20	79.3	Y (D)	ND	ND	22.4
<i>Aglaophenia</i> sp.	8.0	8	0.9	N	NP	NP	NP	
Leg B1	<i>Metridium exilis</i>	59.7	2-96	57.3	Y (1)	62.0	1-95	62.2
	Turf	41.0	2-92	56.4	Y (11)	8.4	0.5-30	46.9
	<i>Corynactis californica</i>	34.6	2-96	20.9	Y (5)	22.8	0.5-90	19.4
	<i>Metridium senile</i>	28.6	2-68	31.8	Y (3)	31.8	1-84	43.9
	<i>Pleurobranchaea californica</i>	18.0	18	0.9	N	ND	ND	1.0
	<i>Desmophyllum dianthus</i>	17.6	2-54	15.5	Y (D)	ND	ND	17.3
	Red Algae	16.6	2-50	18.2	Y (D)	1.7	1-2	25.5
	<i>Metridium farcimen</i>	16.0	16	0.9	N	ND	ND	ND
	<i>Mytilus</i> spp.	14.9	2-44	15.5	Y (6)	19.2	5-85	25.5
	Porifera	10.3	2-32	40.9	Y (7)	10.5	0.5-46	34.7
	<i>Ophiothrix spiculata</i>	7.5	2-18	3.6	Y (D)	ND	ND	13.3
Zoanthidea	7.5	2-12	3.6	Y (12)	6.8	2-15	5.1	
Platform Grace:								
Leg C1	<i>Corynactis californica</i>	47.4	2-90	44.7	Y (2)	42.6	0.5-95	37.0
	Turf	36.6	2-94	86.2	Y (3)	37.4	1-97	87.7
	<i>Anthopleura elegantissima</i> (rm)	34.6	2-86	21.3	Y (4)	30.8	0.5-90	20.5
	<i>Metridium farcimen</i>	27.0	26-28	2.1	N	ND	ND	2.7
	<i>Mytilus</i> spp.	24.7	2-52	20.2	Y (1)	49.1	5-80	23.3
	<i>Obelia</i> sp.	23.7	2-52	19.1	Y (D)	1.0	1	1.4
	Red Algae	19.4	2-56	25.5	Y (6)	21.2	0.5-50	34.2
	<i>Paracyathus stearnsii</i>	15.8	2-56	24.5	Y (D)	ND	ND	39.7
	<i>Ophiothrix spiculata</i>	12.7	2-24	12.8	Y (D)	ND	ND	50.7
	Rockfish	10.0	10	1.1	N	ND	ND	4.1
	<i>Metridium senile</i>	9.3	2-22	3.2	Y (14)	3.7	0.5-12	6.8
<i>Ophionereis</i> sp.	9.3	2-24	6.4	N	ND	ND	1.4	

Table 4-10. Comparison of dominant taxa on the six platforms - PointCount'99® vs. QSA - based on percent cover estimates (continued).

Platform and Leg	Taxa	PointCount'99®			QSA			
		Average Percent Cover	Minimum-Maximum	Frequency (%)	D-R	Average Percent Cover	Minimum-Maximum	Frequency (%)
Leg C4	<i>Corynactis californica</i>	78.3	10-100	39.4	Y (1)	69.2	2-100	29.9
	Zoanthidea	42.3	8-84	6.4	Y (4)	37.6	3-90	9.1
	<i>Metridium senile</i>	41.1	2-90	40.4	Y (3)	36.6	0.5-80	52.3
	<i>Metridium farcimen</i>	37.8	2-80	9.6	Y (D)	ND	ND	14.3
	<i>Mytilus</i> spp.	30.0	2-58	26.6	Y (2)	52.6	5-85	31.2
	Turf	22.0	2-70	76.6	Y (5)	25.6	1-90	59.7
	<i>Metridium exilis</i>	16.0	8-28	3.2	Y (D)	ND	ND	3.9
	Red Algae	14.7	2-30	20.2	Y (7)	16.7	1-50	31.2
	<i>Ophiothrix spiculata</i>	13.9	2-40	29.8	Y (D)	ND	ND	42.9
	Green Algae	13.0	8-18	2.1	N	ND	ND	3.9
	<i>Anthopleura elegantissima</i> (rm)	12.5	2-26	13.8	Y (10)	8.7	1-20	18.2
	<i>Obelia</i> sp.	9.0	2-22	4.3	N	ND	ND	ND
Platform Harvest:								
Leg B1	<i>Metridium senile</i>	47.3	2-96	84.0	Y (2)	38.5	1-90	89.1
	<i>Metridium farcimen</i>	45.3	10-100	3.2	Y (3)	37.0	15-100	5.4
	<i>Pisaster</i> sp.	40.0	40	1.1	N	ND	ND	1.1
	Turf	39.5	2-98	81.9	Y (6)	21.3	1-75	78.3
	<i>Corynactis californica</i>	32.0	2-96	5.3	Y (1)	42.0	3-90	4.3
	<i>Mytilus</i> spp.	25.0	2-50	19.1	Y (7)	21.0	5-50	21.7
	Porifera	14.9	2-68	45.7	Y (9)	7.5	5-10	2.2
	Red Algae	11.6	2-22	18.1	Y (11)	12.2	1-30	23.9
	Macroalgae	10.0	4-16	2.1	N	ND	ND	ND
	<i>Anthopleura elegantissima</i> (rm)	9.8	2-22	11.7	Y (17)	6.2	1-20	17.4
	Bryozoa, erect	8.0	8	1.1	Y (D)	0.5	0.5	3.3
	Encruster	7.7	2-28	26.6	Y (4)	35.4	2-75	52.2
Leg B2	Turf	35.6	2-96	90.0	Y (7)	19.3	0.5-70	82.6
	<i>Metridium senile</i>	34.2	2-76	84.4	Y (5)	29.5	2-90	87.2
	<i>Mytilus</i> spp.	23.3	4-44	23.3	Y (3)	35.0	5-90	24.4
	Porifera	21.5	2-64	41.4	Y (4)	30.0	30	2.3
	<i>Corynactis californica</i>	16.7	2-42	6.7	Y (10)	11.0	1-20	5.8
	Red Algae	15.3	2-38	10.0	Y (14)	5.6	0.5-25	23.3
	Encruster	15.3	2-64	60.0	Y (1)	49.6	3-90	50.0
	Porifera, erect	14.0	14	1.1	Y (2)	48.8	5-80	33.7
	<i>Anthopleura elegantissima</i> (rm)	13.6	2-30	16.7	Y (11)	8.9	2-20	19.8
	<i>Ophiothrix spiculata</i>	12.9	2-38	16.7	Y (D)	ND	ND	40.7
	<i>Obelia</i> sp.	11.0	6-16	2.2	N	ND	ND	ND
	<i>Galathea californiensis</i>	6.7	2-12	3.3	N	ND	ND	3.5

Table 4-10. Comparison of dominant taxa on the six platforms - PointCount'99® vs. QSA - based on percent cover estimates (continued).

Platform and Leg	Taxa	PointCount'99®			QSA			
		Average Percent Cover	Minimum-Maximum	Frequency (%)	D-R	Average Percent Cover	Minimum-Maximum	Frequency (%)
Platform Hidalgo:								
Leg A1	<i>Metridium senile</i>	47.7	2-94	93.8	Y (2)	46.7	3-90	92.1
	<i>Mytilus</i> spp.	36.5	8-62	20.3	Y (1)	57.1	5-85	22.2
	Turf	27.1	2-60	57.8	Y (8)	18.2	2-40	54.0
	<i>Metridium farcimen</i>	20.7	8-42	4.7	Y (5)	21.7	10-35	4.8
	Porifera	17.5	2-64	71.9	Y (D)	27.8	0.5-20	6.4
	Porifera, erect	15.0	10-20	3.1	Y (4)	25.3	5-60	47.6
	<i>Corynactis californica</i>	12.8	4-34	7.8	Y (11)	9.0	2-25	7.9
	<i>Ophiothrix spiculata</i>	10.2	2-42	51.6	Y (D)	ND	ND	77.8
	<i>Pisaster</i> sp.	10.0	4-16	6.3	Y (D)	ND	ND	7.9
	Encruster	9.1	2-52	54.7	Y (3)	16.2	1-60	28.6
	Red Algae	9.0	6-12	3.1	Y (15)	2.2	0.5-10	20.6
	Fan Worm	5.0	2-8	3.1	N	ND	ND	ND
Leg B1	<i>Anthopleura elegantissima</i> (rm)	51.6	4-90	9.5	Y (2)	43.5	1-95	12.8
	<i>Mytilus</i> spp.	45.7	6-72	27.4	Y (1)	54.2	3-80	29.5
	<i>Metridium senile</i>	39.6	2-94	78.6	Y (4)	34.9	0.5-98	82.1
	Turf	36.8	2-100	77.4	Y (6)	30.1	0.5-80	62.8
	<i>Metridium farcimen</i>	17.0	10-24	2.4	Y (8)	17.5	15-20	2.6
	Porifera	15.9	2-46	52.4	Y (5)	30.5	2-80	41.0
	<i>Ophiothrix spiculata</i>	12.2	2-38	33.3	Y (D)	ND	ND	57.7
	Encruster	11.9	2-64	45.2	Y (7)	22.4	5-70	21.8
	Porifera, erect	11.0	2-20	2.4	N	ND	ND	ND
	<i>Cancer</i> sp.	10.0	10	1.2	N	ND	ND	ND
	<i>Florometra serratissima</i>	10.0	10	1.2	N	ND	ND	ND
	<i>Pisaster</i> spp.	9.0	2-14	4.8	Y (D)	ND	ND	7.7
Platform Habitat:								
Leg A1	<i>Corynactis californica</i>	74.1	4-100	49.3	Y (1)	73.5	1-100	47.1
	Zoanthidea	59.3	4-100	8.0	Y (3)	32.3	1-99	15.7
	<i>Metridium farcimen</i>	55.1	2-100	14.7	Y (D)	ND	ND	20.0
	<i>Mytilus</i> spp.	30.6	2-70	28.0	Y (2)	40.6	4-100	37.1
	<i>Anthopleura elegantissima</i> (rm)	30.1	10-98	18.7	Y (4)	23.0	1-95	24.3
	<i>Metridium senile</i>	22.9	2-78	36.0	Y (7)	11.5	0.5-30	37.1
	Turf	15.8	2-94	80.0	Y (8)	10.5	0.5-95	41.4
	Red Algae	13.6	2-48	28.0	Y (5)	22.6	1-50	32.9
	Rockfish	8.0	2-14	2.7	N	ND	ND	ND
	<i>Ophiothrix spiculata</i>	7.7	2-24	24.0	Y (6)	10.8	1-60	57.1
	<i>Coenocyathus bowersi</i>	6.7	2-18	14.7	N	ND	ND	ND
	<i>Paracyathus stearnsii</i>	6.7	2-16	12.0	Y (10)	5.2	1-10	22.9

Table 4-10. Comparison of dominant taxa on the six platforms - PointCount'99® vs. QSA - based on percent cover estimates (continued).

Platform and Leg	Taxa	PointCount'99®			QSA			
		Average Percent Cover	Minimum-Maximum	Frequency (%)	D-R	Average Percent Cover	Minimum-Maximum	Frequency (%)
<i>Platform Irene:</i>								
Leg A1	<i>Metridium senile</i>	57.4	4-100	88.1	Y (1)	66.0	3-90	92.2
	<i>Metridium farcimen</i>	42.0	42	1.5	Y (D)	ND	ND	1.6
	<i>Mytilus</i> spp.	29.7	2-56	59.7	Y (5)	29.5	2-85	51.6
	Porifera	18.1	2-48	46.3	Y (4)	32.4	1-60	7.8
	Turf	14.7	2-54	71.6	Y (8)	10.2	1-25	7.8
	Red Algae	11.8	2-48	16.4	Y (D)	ND	ND	3.1
	<i>Balanus</i> spp.	10.2	2-28	25.4	Y (D)	ND	ND	29.7
	Green Algae	8.0	8	1.5	Y (9)	10.0	10	1.6
	<i>Pollicipes polymerus</i>	7.0	2-12	3.0	Y (D)	ND	ND	4.7
	<i>Pisaster</i> sp.	6.2	2-12	13.4	Y (D)	ND	ND	15.6
	<i>Anthopleura elegantissima</i> (rm)	5.0	2-8	9.0	Y (10)	3.9	0.5-10	18.8
	<i>Cancer</i> sp.	4.5	2-6	6.0	Y (D)	ND	ND	14.1

Notes: D-R = Dominant-Rank; indicates whether the taxon was a percent cover dominant or subdominant identified during QSA (Y – yes; N – no) and, if so, what rank; QSA percent cover rankings noted in parentheses. In cases where a taxon was not determined (ND) during QSA percent cover analyses, QSA density data were reviewed and applied, as appropriate (e.g., QSA frequency of occurrence column); ranking entries may also reflect the presence of the taxon as a density dominant or subdominant (D).

Taxonomic notes:

- *Anthopleura elegantissima* (rm) = *Anthopleura elegantissima* (rosy morph)
- Zoanthidea noted during PointCount'99® analyses identified as Zoanthid, colonial tan (Platform Gail, Legs A1 and B1; Platform Grace, Leg C4; Platform Habitat, Leg A1) or Zoanthid (*Palythoa*) (Platform Habitat, Leg A1) during QSA.
- Red algae noted during PointCount'99® analyses identified as Filamentous or Foliose red algae during QSA (present on all except Platform Hidalgo, Leg B1).
- Porifera noted during PointCount'99® analyses identified as sponge, tan encrusting (Platform Gail, Leg B1; Platform Harvest, Leg B1) or sponge, tan encrusting and sponge, tan foliose (combined) (Platform Hidalgo, Leg A1) during QSA. Porifera noted during PointCount'99® analyses identified as *Leucetta losangelensis* during QSA (Platform Hidalgo, Leg B1).
- Porifera, erect noted during PointCount'99® analyses identified as *Leucetta/Leucetta losangelensis* during QSA (Platform Harvest, Leg B2).
- *Ophionereis* sp. noted during PointCount'99® analyses identified as Ophiuroid, unidentified during QSA (Platform Grace, Leg C1).
- Rockfish noted during PointCount'99® analyses identified as *Sebastes* spp. during QSA (Platform Grace, Leg C1).
- Green algae noted during PointCount'99® analyses identified as *Ulva lactuca* during QSA (Platform Grace, Leg C4).
- Bryozoa, erect noted during PointCount'99® analyses identified as Bryozoa, tan branching during QSA (Platform Harvest, Leg B1).
- Encruster noted during PointCount'99® analyses identified as Encruster, red during QSA (Platform Harvest, Leg B1; Platform Hidalgo, Leg B1). Encruster noted during PointCount'99® analyses identified as Encruster – tan and Encruster – lavender (combined) during QSA (Platform Hidalgo, Leg A1).
- *Pisaster* sp./spp. noted during PointCount'99® analyses identified as *Pisaster ochraceus*, *P. brevispinus*, and *P. giganteus* (Platform Hidalgo, Leg A1), *P. giganteus* and *P. ochraceus* (Platform Hidalgo, Leg B1), or *P. ochraceus* (Platform Harvest, Leg B1) during QSA.
- *Metridium farcimen* noted during PointCount'99® analyses identified as *Metridium* sp. during QSA (only at Platform Habitat, Leg A1).
- *Cancer* sp. noted during PointCount'99® analyses identified as *Cancer antennarius* and *Cancer* sp. (combined) during QSA (Platform Irene, Leg A1).

During point count analyses, several taxa were identified using a different set of descriptors. Undifferentiated groups which were noted during point counts were lumped into larger categories (e.g., sponges, encrusters, red algae). Comparisons of point count findings to QSA results prompted a series of clarifying notes relevant to phylogenetic classification and species distribution by platform, as footnoted in **Table 4-10**. These notes rectify several minor inconsistencies in terminology. For example, Zoanthidae noted during point count analyses were identified as either Zoanthid, colonial tan (Platform Gail, Legs A1 and B1; Platform Grace, Leg C4; Platform Habitat, Leg A1) or Zoanthid (*Palythoa*) (Platform Habitat, Leg A1) during QSA.

Several taxa were not determined during QSA percent cover analyses but were identified during point count analyses. In many cases, percent cover determinations for these taxa were not practical (e.g., barnacles – *Balanus nubilus* and *Balanus* spp.; *Metridium farcimen*; *Desmophyllum dianthus*; *Ophiothrix spiculata*; *Paracyathus stearnsii*; *Pisaster* sp./spp.); however, individual count data for these taxa were available and frequency of occurrence data were integrated into **Table 4-10**.

In one instance, a taxon was identified during the point count analyses which had not been noted during QSA (e.g., *Aglaophenia* sp.). In several other instances, taxa identified during point count were not among the taxa identified during QSA (e.g., *Obelia* sp. on Platform Grace, Leg C4; Platform Harvest, Leg B2; fan worm on Platform Hidalgo, Leg A1). Because point count analyses utilized digital images (while QSA relied upon the projection of 35-mm slide transparencies), additional flexibility was available to the taxonomists to further identify specimens. For example, an image area containing a specimen of interest could be digitally magnified, allowing for closer examination of key taxonomic characteristics. Image comparisons could also be made to assist in species identifications. In those cases where new taxa were identified (i.e., taxa not observed during QSA), their frequency of occurrence was extremely low.

Overall, the presence and relative ranking of percent cover dominants from the PointCount'99® analysis were very consistent with the results of whole slide analysis. While random point count provides a straightforward means of identifying percent cover dominants within a photographic image, whole slide analysis, based either on individual counts or percent cover estimates, provides a more comprehensive characterization of all taxa present, within the limitations of photographic interpretation and identification.

4.4.5 Clustering Analyses

Quantitative (Whole) Slide Analysis

Platform Leg Comparisons

The initial clustering analysis combined all whole slide data from each single platform leg, effectively eliminating all biotic zones, to create ten separate single data sets. This process was repeated for both density (i.e., count) and percent cover data.

Results of the clustering analysis using the density data sets (see **Figure 3-15**) indicated greatest similarity (~80 percent) between (1) adjacent legs on Platform Harvest; (2) adjacent legs on Platform Hidalgo; and (3) Platform Gail (Leg A1) and Platform Grace (Leg C4). At the next similarity level, Platform Habitat (Leg A1) exhibited an affinity with the Platform Gail (Leg A1)-Platform Grace (Leg C4) grouping. This three-platform grouping next showed affinity with Platform Grace (Leg C1). Platform Harvest and Habitat groups also showed similarity to one another, then coupled with Platform Gail (Leg B1), and finally with Platform Irene, Leg A1. At the lowest similarity level, the Grace-Gail (Leg A1)-Habitat group was separate from the Harvest-Hidalgo-Irene-Gail (Leg B1) group.

While similarity between adjacent legs on the same platform might be expected, the high level of similarity between Grace and Gail was not. While Grace and Gail are both located in the eastern Santa Barbara Channel, there are significant water depth differences and corresponding differences in the total number of biotic zones between the two platforms. The process of combining data along a platform leg effectively eliminates any biotic zone bias that might be introduced and allows for a direct comparison of flora and fauna between legs. In this instance, it appeared that the relative contribution of fauna from the lower zone of Gail had minor effect on clustering; the strong similarities evident were attributed to geographic proximity. Support for this hypothesis was also evident in subsequent groupings, where the Santa Barbara Channel platforms (Habitat-Grace-Gail) exhibited similarity with one another and the Santa Maria Basin platforms (Harvest-Hidalgo-Irene) grouped in similar fashion. The inconsistent element in the clustering results rested with Platform Gail (Leg B1), which showed similarity with Harvest-Hidalgo-Irene. No obvious explanation was available to explain this clustering result.

Results of the clustering analysis using percent cover data (see **Figure 3-16**) were very similar to those shown by the count data and strongly supported similarities between adjacent legs. Greatest similarities, in descending order, were evident between adjacent legs on all primary platforms – Harvest, Hidalgo, Gail, and Grace. The secondary platforms grouped according to geographic location: Habitat grouped with Grace, while Irene grouped with the Hidalgo-Harvest grouping.

Biotic Zone Comparisons

The second clustering of whole slide data determined the similarities between biotic zones, with separate analyses using density (i.e., count) and percent cover data. By maintaining separate biotic zones, 52 total data sets were compared.

Results of clustering analysis using density data (see **Figure 3-17**) indicated strongest similarities between (1) Platform Irene (Leg A1) *Mytilus* and *Corynactis* zones; (2) Platform Harvest (Legs B1 and B2) *Metridium*/sea star zones; and (3) Platform Hidalgo (Leg B1) intertidal and *Mytilus* zones. Unexpectedly high similarities were noted for (1) Platform Gail (Leg A1) barnacle/scallop and Platform Habitat (Leg A1) *Corynactis* zones; and (2) Platform Grace (Leg C4) encruster/sea star and Platform Harvest (Leg B1) vase sponge/encruster zones. The Gail-Habitat anomaly was explained through a review of the dominant taxa present in each respective zone. The barnacle/scallop zones of Platform Gail, while relatively devoid of scallops, contained numerous barnacles, ophiuroids (including *Ophiothrix spiculata*), and

anemones (*Corynactis californica*, *Metridium senile*, and *M. exilis*). *Corynactis californica*, *Ophiothrix spiculata*, and barnacles were also dominants in the *Corynactis* zone of Platform Habitat.

The top down analysis of density clustering results produced three groupings which generally reflected community water depth. Group A, comprised of 18 data sets, consisted exclusively of intertidal and *Mytilus* communities of platforms Gail, Grace, Harvest, Hidalgo, and Habitat, with small contributions from barnacle/scallop and *Corynactis* assemblages from Platform Gail. The intertidal assemblages at Platform Irene were outliers, perhaps a result of the low species diversity evident at this platform. Group B, comprised of 25 data sets, consisted exclusively of *Metridium*/sea star, *Metridium*/encruster, anemone/encruster, and vase sponge/encruster zones of platforms Gail, Harvest, Hidalgo, and Habitat, plus several contributions from the barnacle zone of Platform Hidalgo. The last group, Group C, was comprised of nine data sets and consisted of barnacle/scallop, *Corynactis*/encruster, encruster/sea star, and anemone/encruster zones from platforms Gail, Grace, and Habitat.

Results of clustering analysis using percent cover data (see **Figure 3-18**), while producing associations which were not identical to those noted with the count data, did identify strong similarities between adjacent zones of the same platform leg or the same zones between adjacent legs. In general, with minor exception, similarity groupings (based on count or percent cover biotic zone data resulting from whole slide analysis) tended to occur between adjacent zones of the same platform leg (e.g., intertidal and *Mytilus*) or the same zones between adjacent legs. These results suggested that there was (1) a strong similarity between biota of adjacent platform legs, and (2) a gradual shift in community structure with increasing depth along a platform leg. Further, the boundaries of each biotic zone were not tied strictly to water depth.

The top down analysis of percent cover clustering results produced four groupings. Group A, comprised of seven data sets, consisted of intertidal and *Mytilus* communities from platforms Gail and Habitat. Group B, comprised of 15 data sets, consisted of intertidal and *Mytilus* communities from platforms Grace, Harvest, and Hidalgo, with small, anomalous contributions from sponge/encruster and encruster/sea star zones of platforms Hidalgo and Grace. Group C, comprised of 22 data sets, consisted barnacle, barnacle/*Corynactis*, barnacle/algae, *Corynactis*/encruster, *Metridium*/sea star, and *Metridium*/encruster communities from platforms Gail, Harvest, and Hidalgo, with minor contributions from vase sponge/encruster and vase sponge/sea star/cup coral assemblages from platforms Harvest and Gail, respectively. Group D, comprised of seven data sets, consisted of barnacle/scallop and anemone/encruster communities from platforms Grace and Gail, with minor contribution from *Corynactis* and *Metridium*/encruster assemblages from Platform Habitat. One lone outlier, the intertidal zone from Platform Irene, was not grouped with any of the communities noted above. These results highlight the similarities evident between intertidal and *Mytilus* zones of all platforms, with no strong indication of differences attributed to geographic location.

PointCount'99® Analysis

The first clustering analysis of PointCount'99® data determined similarities between platform legs (see **Figure 3-19**). Greatest similarities were evident between (1) adjacent legs on Platform Harvest; and (2) adjacent legs on Platform Hidalgo. Subsequent groupings included (1) Platform Grace (Leg C4) and Platform Habitat (Leg A1); and (2) Platform Harvest (Legs B1

and B2) and Platform Hidalgo (Legs A1 and B1). These groupings were identical to those exhibited in the first clustering analysis of whole slide data (i.e., count data set), with the exception of the Grace-Hidalgo grouping. While the Harvest-Hidalgo grouping suggests a strong similarity between these two southern Santa Maria Basin platforms, no other groupings suggested a geographic-based similarity.

The second clustering of PointCount'99® data determined the similarities between biotic zones (see **Figure 3-20**). Greatest similarities were evident between (1) Platform Irene (Leg A1) *Mytilus* and *Corynactis* zones; (2) Platform Gail (Leg A1) barnacle/scallop and Platform Grace (Leg C4) barnacle/scallop zones; (3) Platform Harvest (Leg B2) anemone/encruster and Platform Hidalgo (Leg A1) sponges/encruster zones; and (4) Platform Hidalgo (Legs A1 and B1) intertidal zones. The Irene *Mytilus* and *Corynactis* grouping was also evident in the first clustering of whole slide data, however, the remaining groupings were not evident in the earlier clustering analysis. Strongest similarities were evident between similar zones (e.g., intertidal, *Metridium*/encruster), regardless of platform geographic location or water depth.

The top down analysis of the PointCount'99® biotic zone data sets resulted in the identification of four groupings. Group A, comprised of 14 data sets, consisted of select intertidal and *Mytilus* communities from platforms Gail, Grace, Harvest, Hidalgo, Habitat, and Irene. This grouping suggests a similarity between intertidal and *Mytilus* zones, exclusive of Groups C and D (below), regardless of geographic location. Group B, comprised of 14 data sets, consisted of (1) *Corynactis*/encruster, encruster/sea star/cup coral, and vase sponge/encruster communities of Platform Gail; (2) *Mytilus* and encruster/sea star communities of Platform Grace; (3) anemone/encruster, vase sponge/encruster, and *Metridium*/sea star communities of Platform Harvest; and (4) sponges/encruster communities of Platform Hidalgo. This grouping suggested similarity between the zones present in intermediate water depths of select platforms, most of which were characterized by the presence of encrusters, regardless of geographic location. Group C, comprised of 14 data sets, consisted of (1) *Mytilus*, barnacle/*Corynactis*, and *Metridium*/sea star communities of Platform Harvest; (2) *Mytilus*, barnacle, and *Metridium*/encruster communities of Platform Hidalgo; and (3) barnacle/algae, *Mytilus*, and *Corynactis*/encruster communities of Platform Irene. This grouping suggested similarity of biotic zones across a depth range for the northern platforms, and indicated that several taxa (e.g., *Metridium senile*, *Leucetta*) that were widely distributed down a platform leg produced a biotic continuum which countered the concept of distinct biotic zones. Group D, comprised of 10 data sets, consisted of (1) intertidal, *Mytilus*, barnacle/scallop, and vase sponge/encruster communities of Platform Gail; (2) barnacle/scallop and anemone/encruster communities of Platform Grace; and (3) *Corynactis* and *Metridium*/encruster communities of Platform Hidalgo. This grouping also suggested the presence of a biotic continuum, with several species present (and often dominant) in adjacent biotic zones (e.g., *Ophiothrix spiculata*, *Metridium senile*, barnacles, *Corynactis californica*).

Diablo and Nifty Rocks and Comparable Platform Zones

The last set of clustering analyses employed whole slide data to determine the similarities between epibiota of natural rock outcrops and platform legs within similar water depths using density (i.e., count) and percent cover data sets (see **Figures 3-21** and **3-22**).

Results of clustering analysis using count data, comparing platform biota to natural outcrop communities in the 5 to 17 m depth range, indicated greatest similarities between (1) Platform Hidalgo (Leg A1) and Platform Irene (Leg A1); (2) Platform Grace (Leg C1) and Diablo Rock; and (3) Platform Harvest (Legs B1 and B2). At the next similarity level, three groupings were evident, including: (1) Nifty Rock with the Hidalgo-Irene group; (2) Hidalgo (Leg B1) with the Harvest (Leg B1-Leg B2) grouping; and (3) Platform Gail (Legs A1 and B1). Results of the clustering analysis using density data indicated that (1) natural outcrop communities have a moderate affinity with select platform communities - Diablo Rock with Platform Grace and Nifty Rock with the Hidalgo-Irene group; (2) there were strong similarities between adjacent platform legs; and (3) similarities between biota within the upper depth zones (*Mytilus*, barnacle/scallop, barnacle/algae) of two of the northern platforms (Hidalgo and Irene).

Results of the clustering analysis using percent cover data revealed greatest similarities for (1) Platform Hidalgo (Leg A1) and Platform Irene (Leg A1); (2) Platform Grace (Leg C4) with the Hidalgo-Irene group; and (3) Platform Harvest (Leg B2) with the Grace-Hidalgo-Irene group. Diablo Rock exhibited closest affinity to the Harvest-Grace-Hidalgo-Irene group, while Nifty Rock showed greatest similarity with Platform Grace (Leg C1). Aside from the Hidalgo-Irene grouping, none of the percent cover similarities were evident in the earlier count data comparisons. No readily discernable trends were evident.

4.5 Depth Distribution of Platform-Associated Biota

A total of four to six biotic zones were identified for each platform, depending upon water depth, as outlined in **Section 3.1**. The review of inspection videotapes provided a continuous broad view and characterization of the invertebrate and algal communities present on platform legs, from the intertidal to the base of each platform. In contrast, the results of the quantitative slide analysis, where 15 or more 35-mm slide transparencies from each biotic zone were evaluated, provided identification and enumeration of all recognizable species present (i.e., numbers of individuals and percent cover per 0.0625 m²).

Density- and coverage-dominant taxa identified at each platform were tabularized in **Tables 3-3** through **3-12** and summarized in the accompanying text of **Section 3.3**. **Table 4-11** provides a narrative summary of the depth distributions of density- and percent-cover dominants at each platform. For primary platforms, depth information for the species present on adjacent legs has been combined, reflecting a composite characterization of depth distribution. For secondary platforms, depth-related species data from a single leg has been summarized.

In general, the biotic zones determined from videotape analysis were confirmed through the photographic analysis. Mussel zones were always present, although their vertical extent may have differed from those estimated from the videotapes alone. This was not necessarily unexpected given the fact that the videotapes were representative of all platform legs, while the present analysis considered only one or two legs; reviewers normally identified maximum depth of occurrence for the mussel zone. Further, considerable time may have separated the collection of videotape information from the collection of photographic data during the current analysis.

Table 4-11. Comparison of biotic zones and species/taxon presence by depth at six platforms.

Biotic Zone Designation	Zone Depth [ft (m) subsurface]	Prominent Taxa
Platform Gail, Legs A1 and B1		
Intertidal	0 to 6 (0 to 1.8 m)	This zone was comprised predominantly of barnacles (<i>Balanus</i> spp.), algae (filamentous red), mussels (<i>Mytilus</i> spp.), anemones (<i>Anthopleura elegantissima</i> [rosy morph]; <i>Metridium exilis</i> , <i>M. senile</i>), and tan branching hydroids
<i>Mytilus</i>	6 to 40 (1.8 to 12.1 m)	<i>Mytilus</i> spp. occurred from 3 to 53 ft; mussels co-occurred with algae (filamentous red), ophiuroids (<i>Ophiothrix spiculata</i> and unidentified ophiuroids), and <i>Metridium senile</i>
Barnacle/Scallop	40 to 160 (12.1 to 48.8 m)	<i>Balanus</i> spp. occurred from 3 to 57 ft; <i>Crassadoma</i> was found in low abundance and infrequently at 18, 24, 53, 74, 127, and 173 ft; ophiuroids (<i>Ophiothrix spiculata</i> , unidentified ophiuroids) and anemones (<i>Corynactis californica</i> , <i>Metridium senile</i> , and <i>M. exilis</i>) were numerical dominants in this depth range; a tan encrusting sponge and a yellow encrusting sponge were contributors to percent cover
<i>Corynactis</i> /Encruster	160 to 380 (48.8 to 115.8 m)	<i>Corynactis californica</i> occurred from 144 to 199 ft; <i>Metridium exilis</i> was present in very high abundance between 36 and 322 ft; turf was also present, contributing to percent cover
Vase sponge/ Encruster	380 to 630 (115.8 to 192.0 m)	No vase sponges (e.g., <i>Staurocalyptus</i> , <i>Leucilla</i>) were present in this depth range; the zone was occupied by <i>Metridium senile</i> , <i>Ophiothrix spiculata</i> , limited presence of <i>Corynactis californica</i> , and plain worm tubes
Encruster/Sea Star/ Cup Coral	630 to 739 (192.0 to 225.2 m)	<i>Paracyathus stearnsii</i> occurred from 173 to 184 ft, 261 to 315 ft, and 415 ft; this zone was occupied by <i>Metridium senile</i> , <i>Desmophyllum</i> , and plain worm tubes, as well as turf
Platform Grace, Legs C1 and C4		
Intertidal	0 to 6 (0 to 1.8 m)	This zone was comprised primarily of barnacles (<i>Balanus</i> spp.), algae (filamentous red), mussels (<i>Mytilus</i> spp.), and anemones (<i>Anthopleura elegantissima</i> [rosy morph]; <i>Metridium senile</i>)
<i>Mytilus</i>	6 to 45 (1.8 to 13.7 m)	<i>Mytilus</i> spp. was predominant in this zone between 3 and 40 ft, with limited presence of <i>M. californianus</i> ; mussels co-occurred with the anemone <i>Anthopleura elegantissima</i> (rosy morph), ophiuroids (<i>Ophiothrix spiculata</i>), and <i>Metridium senile</i>
Barnacle/Scallop	45 to 90 (13.7 to 27.4 m)	<i>Balanus nubilis</i> was present at 49, 61, and 76-133 ft; <i>Crassadoma gigantea</i> exhibited limited presence between 69 and 146 ft; <i>Corynactis californica</i> occurred in dense aggregations throughout this zone in depths of 50 to 150 ft
Anemone/Encruster	90 to 230 (27.4 to 70.1 m)	<i>Metridium senile</i> was very limited in its presence in this zone, however, <i>M. farcimen</i> was prevalent between 150 and 200 ft and beyond; this depth zone was dominated by <i>Coenocyathus bowersi</i> , <i>Corynactis californica</i> , and <i>Metridium farcimen</i>
Encruster/Sea Star	230 to 318 (70.1 to 96.9 m)	<i>Asterina</i> was present from 238 to 308 ft), although not a dominant; this depth zone was dominated by <i>Metridium farcimen</i> and <i>Paracyathus stearnsii</i> ; a tan zoanthid was also present as a percent cover dominant

Table 4-11. Comparison of biotic zones and species/taxon presence by depth at six platforms (continued).

Biotic Zone Designation	Zone Depth [ft (m) subsurface]	Prominent Taxa
<i>Platform Harvest, Legs B1 and B2</i>		
Intertidal	0 to 6 (0 to 1.8 m)	This zone was comprised primarily of barnacles (<i>Balanus</i> spp.), algae (filamentous and foliose red), anemones (<i>Anthopleura elegantissima</i> [rosy morph]; <i>Metridium senile</i>), and a limited number of mussels (<i>Mytilus</i> spp.) and sponges (<i>Leucetta</i>)
<i>Mytilus</i>	6 to 85 (1.8 to 25.9 m)	<i>Mytilus</i> spp. occurred from 2 to 46 ft; barnacles (<i>Balanus</i> spp.), unidentified ophiuroids (i.e., identified as <i>Ophiothrix spiculata</i> from scraping results), and <i>Leucetta</i> were also dominant taxa in this depth range
Barnacle/ <i>Corynactis</i>	85 to 165 (25.9 to 50.3 m)	<i>Balanus</i> spp. exhibited relatively high abundance from 100 to 157 ft; <i>Corynactis californica</i> occurred intermittently between 101 and 146 ft but was rarely a numerical or percent cover dominant; this zone was also densely populated by <i>Metridium senile</i> , some <i>Leucetta</i> , and, along it lower reaches, turf
Anemone/Encruster	165 to 345 (50.3 to 105.2 m)	<i>Metridium senile</i> occurred along almost the entire length of the platform as both a numerical and percent cover dominant; a red encruster was prevalent between below 176 ft; turf, calcareous worm tubes, and bare metal were also common in this zone
Vase Sponge/ Encruster	345 to 555 (105.2 to 169.2 m)	<i>Staurocalyptus</i> was not present; <i>Leucilla</i> was present intermittently between 90 and 241 ft); this zone was occupied primarily by <i>Metridium senile</i> , calcareous worm tubes, a red encruster, a few ophiuroids, turf, and bare metal
<i>Metridium</i> /Sea Star	555 to 675 (169.2 to 205.7 m)	<i>Metridium senile</i> occurred along almost the entire length of the platform and was a dominant in this depth range; a red encruster was also prevalent, co-occurring with calcareous worm tubes, turf, and bare metal; no sea stars were evident within this depth range
<i>Platform Hidalgo, Legs A1 and B1</i>		
Intertidal	0 to 6 (0 to 1.8 m)	This zone was comprised primarily of barnacles (<i>Balanus</i> spp.; <i>Balanus nubilus</i> ; <i>Tetraclita squamosa</i>), anemones (<i>Metridium senile</i> ; a few <i>Anthopleura elegantissima</i> [rosy morph]), mussels (<i>Mytilus</i> spp.), sponges (<i>Leucetta losangelensis</i>), and a feather duster worm <i>Eudistylia polymorpha</i>
<i>Mytilus</i>	6 to 65 (1.8 to 19.8 m)	<i>Mytilus</i> spp. occurred from 2 to 29 ft; barnacles (primarily <i>Balanus nubilus</i>), anemones (<i>Metridium senile</i> ; <i>Anthopleura elegantissima</i> [rosy morph]), ophiuroids, and <i>Leucetta</i> were also dominant in this zone
Barnacle	65 to 105 (19.8 to 32.0 m)	<i>Balanus nubilus</i> occurred as a dominant species from 5 to 101 ft; this zone was also dominated by <i>Corynactis californica</i> (on Leg A1 only) and sponges (<i>Leucetta</i>)
<i>Metridium</i> /Encruster	105 to 360 (32.0 to 109.7 m)	<i>Metridium senile</i> occurred from 103 to 165 ft and from 340 to 424 ft; this zone was also dominated by ophiuroids, with frequent presence of calcareous worm tubes, turf, and, in the upper portions of the zone, <i>Leucetta</i>
Sponges/Encruster	360 to 434 (109.7 to 132.3 m)	<i>Leucetta</i> did not occur below 222 ft; calcareous worm tubes, <i>Metridium senile</i> , <i>Metridium farcimen</i> , and unidentified ophiuroids were dominants in this depth range; <i>M. farcimen</i> occurred near the base of the platform, from 427 to 431 ft; tan and lavender encrusters and turf were also prominent in this depth zone

Table 4-11. Comparison of biotic zones and species/taxon presence by depth at six platforms (continued).

Biotic Zone Designation	Zone Depth [ft (m) subsurface]	Prominent Taxa
<i>Platform Habitat, Leg A1</i>		
Intertidal	0 to 6 (0 to 1.8 m)	This zone was comprised primarily of mussels (<i>Mytilus</i> spp.), anemones (<i>Metridium senile</i> ; <i>Anthopleura elegantissima</i> [rosy morph]), barnacles (<i>Balanus nubilus</i>), and ophiuroids (<i>Ophiothrix spiculata</i>)
<i>Mytilus</i>	6 to 60 (1.8 to 18.3 m)	<i>Mytilus</i> occurred from 4 to 52 ft (and at 77 to 78 ft); this zone was dominated by mussels, with co-dominants <i>Metridium senile</i> , <i>Anthopleura elegantissima</i> , <i>Balanus nubilus</i> , and <i>Ophiothrix spiculata</i> ; other species of interest in the lower portions of this zone included the dorid nudibranch <i>Triopha catalinae</i> and the sponge <i>Staurocalyptus</i>
<i>Corynactis</i>	60 to 180 (18.3 to 54.9 m)	<i>Corynactis</i> occurred between 50 and 205 ft in relative high densities; other species present in this zone included <i>Balanus nubilus</i> , <i>Ophiothrix spiculata</i> , <i>Paracyathus stearnsii</i> , <i>Triopha catalinae</i> , <i>Corallina</i> , and <i>Staurocalyptus</i>
<i>Metridium</i> /Encruster	180 to 290 (54.9 to 88.4 m)	<i>Metridium</i> spp. occurred at 178 to 190 ft, 196 ft, 213 to 259 ft, and 269 to 283 ft; other taxa which co-occurred in this depth range included <i>Triopha</i> , <i>Paracyathus stearnsii</i> , and <i>Corynactis californica</i>
<i>Platform Irene, Leg A1</i>		
Intertidal	0 to 6 (0 to 1.8 m)	This zone was comprised primarily of mussels (<i>Mytilus californianus</i>), anemones (<i>Metridium senile</i> ; <i>Anthopleura elegantissima</i> [rosy morph], one occurrence of <i>Anthopleura</i> sp. [whitish]), barnacles (<i>Tetraclita squamosa</i>), and <i>Corynactis californica</i>
Barnacle/Algae	6 to 35 (1.8 to 10.7 m)	<i>Balanus</i> occurred from 5 to 101 ft; <i>Anthopleura elegantissima</i> (rosy morph), <i>Ophiothrix spiculata</i> , and <i>Metridium senile</i> were also dominants within this depth range
<i>Mytilus</i>	35 to 85 (10.7 to 25.9 m)	<i>Mytilus</i> spp. occurred intermittently from 38 to 79 ft, while <i>Mytilus californianus</i> occurred from 1 to 31 ft and from 48 to 51 ft; <i>Metridium senile</i> and <i>Balanus</i> spp. were numerical dominants in this depth range; <i>Pisaster ochraceus</i> was also present between 24 and 39 ft
<i>Corynactis</i> /Encruster	85 to 242 (25.9 to 73.4 m)	<i>Corynactis californica</i> only occurred between 2 and 10 ft; this zone was dominated by <i>Metridium senile</i> , <i>Balanus</i> spp., and a yellow encrusting sponge were dominants in this depth range

Mussel zones extended to depths of 16 m (52 ft), with only limited presence below that depth (maximum depth: 24 m; 79 ft). *Mytilus* typically co-occurred with several taxa, including (1) algae, with filamentous and foliose red algae predominating, extending to depths of 17 to 20 m (55 to 65 ft); barnacles, with *Balanus nubilis* and *Balanus* spp. predominant; and (3) several anemone species, including *Anthopleura elegantissima* (rosy morph) and *Metridium senile*. Ophiuroids were also present within the mussel zone, but typically in the mid to lower portions of the *Mytilus* zone, perhaps to avoid stronger surge present closer to the surface.

Dominant species or taxa found at intermediate depths and beyond were generally, but not always, consistent with the biotic zone designations. These findings may be related to the broad categories used in the videotape analysis (e.g., encrusters), may reflect differences inherent in comparing data sets acquired at different spatial scales, or may be attributed to changes in community composition over time. Overall, it was evident that there was considerable overlap in the depth distributions of major taxa (i.e., density- and percent cover dominants).

In general, there was an intermediate (mid) zone, located below the mussel zone at water depths ranging from 19 to 26 m [65 to 85 ft] to about 76 m [250 ft]). Prominent taxa in this mid zone included *Corynactis californica*, ophiuroids, barnacles, *Metridium senile*, *Leucetta*, and worm tubes. It has been suggested that the presence of a dense *Corynactis californica* zone below the *Mytilus* zone is important to the health of the mussel bed, as the anemone's nematocysts provide a barrier to starfish species that prey on mussels (J. Ljubenkov, pers. comm., 2005). Other species (e.g., *Metridium senile*) also occur above and below this mid zone, while barnacles and worm tubes also occur above and below this zone, respectively.

Below the mid zone, a lower zone was present (below 76 m [250 ft]). Prominent taxa in the lower zone were more variable among the platforms and included *Metridium senile*, *M. farcimen*, *Paracyathus stearnsii*, red encruster, turf, worm tubes, and *Desmophyllum dianthus* (below 168 m [550 ft]). While *M. senile* was present at all of the platforms, its depth distribution was variable; on occasion, this species was present for the intertidal to the base of the platform (e.g., at platforms Harvest and Irene), while on other platforms its depth distribution was more intermittent (e.g., at platforms Grace, Habitat, and Hidalgo). Similarly, turf was present on all platforms as a dominant or sub-dominant taxa but its depth distribution was variable. Other taxa within the lower zone were restricted in their geographic distribution (i.e., between platforms).

Paracyathus stearnsii was not present at platforms Hidalgo or Irene, and only occurred on one leg of Platform Harvest, yet was a dominant at the remaining (Santa Barbara Channel) platforms within the lower zone. The red encruster was a major contributor to percent cover in the lower zones on two legs of Platform Harvest, a single leg of Platform Hidalgo, and a single leg of Platform Irene, yet was totally absent from all of the remaining platforms. *Desmophyllum dianthus* was present in the lower zone only at Platform Gail.

Graphic representations of the generalized depth distribution of dominant species present at each platform are provided in **Figures 4-1** through **4-3**. These figures present generalized depth distribution patterns, based on random sampling between the shallow intertidal and base of one or two platform legs.

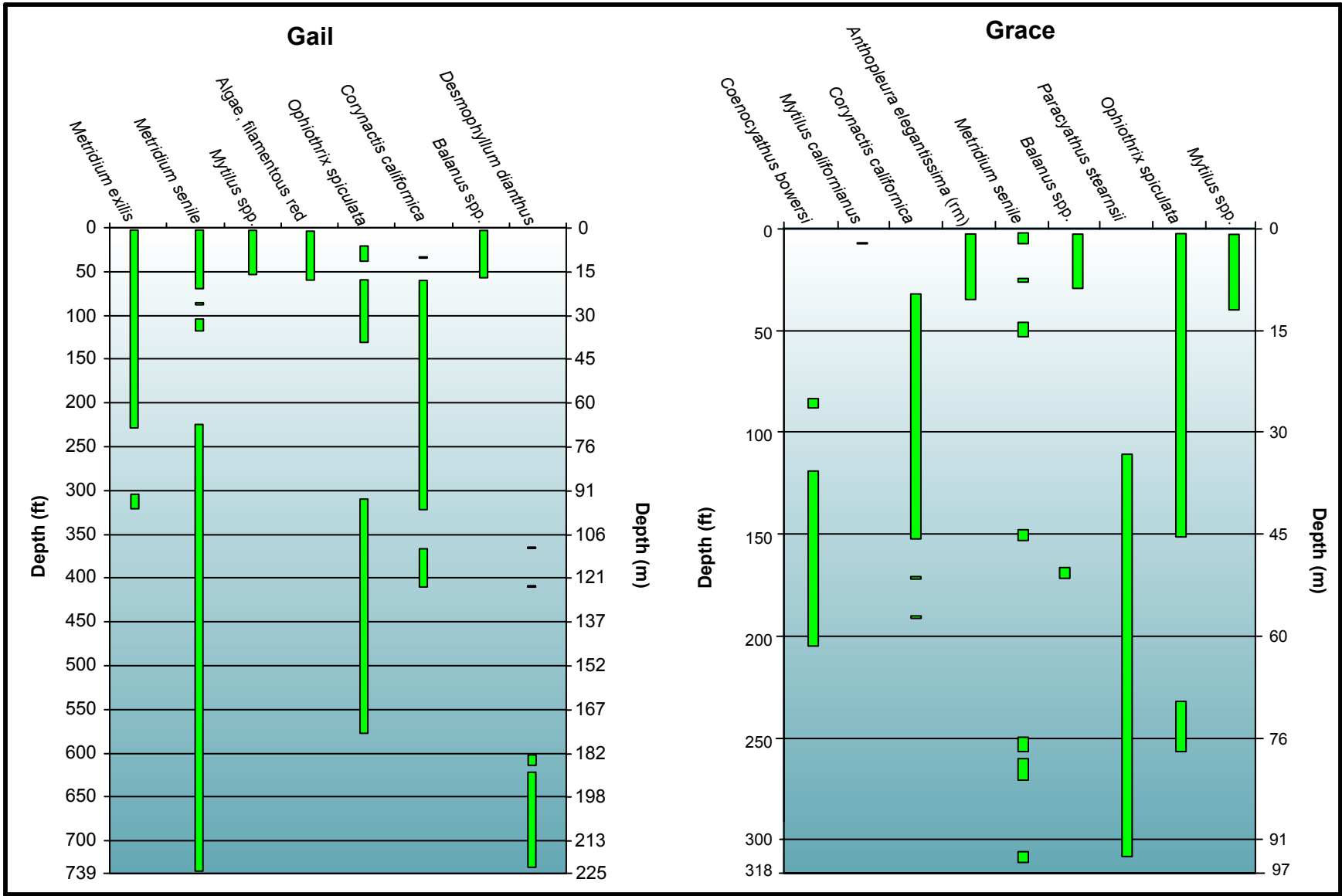


Figure 4-1. Generalized depth distribution of dominant species present at platforms Gail and Grace.

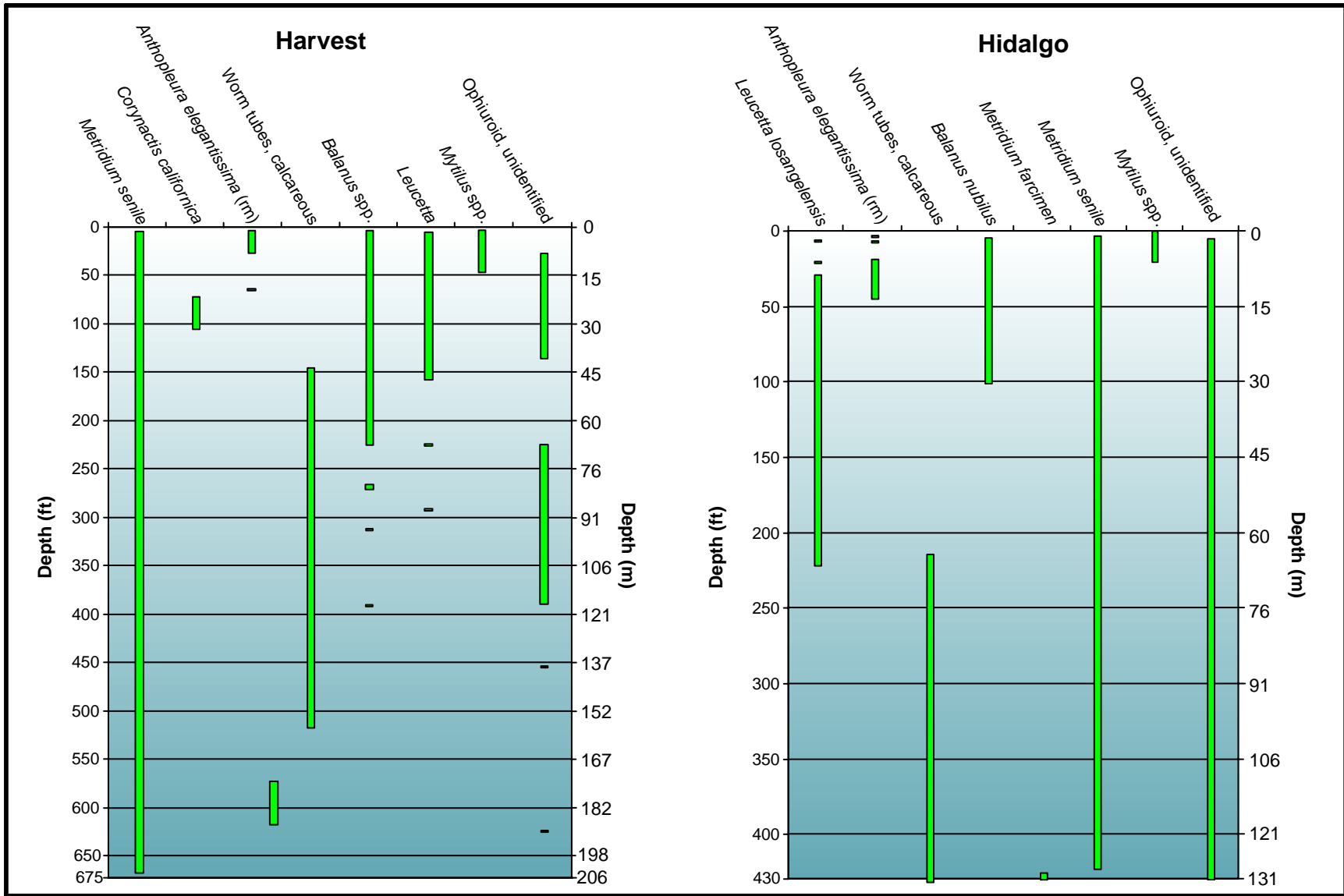


Figure 4-2. Generalized depth distribution of dominant species present at platforms Harvest and Hidalgo.

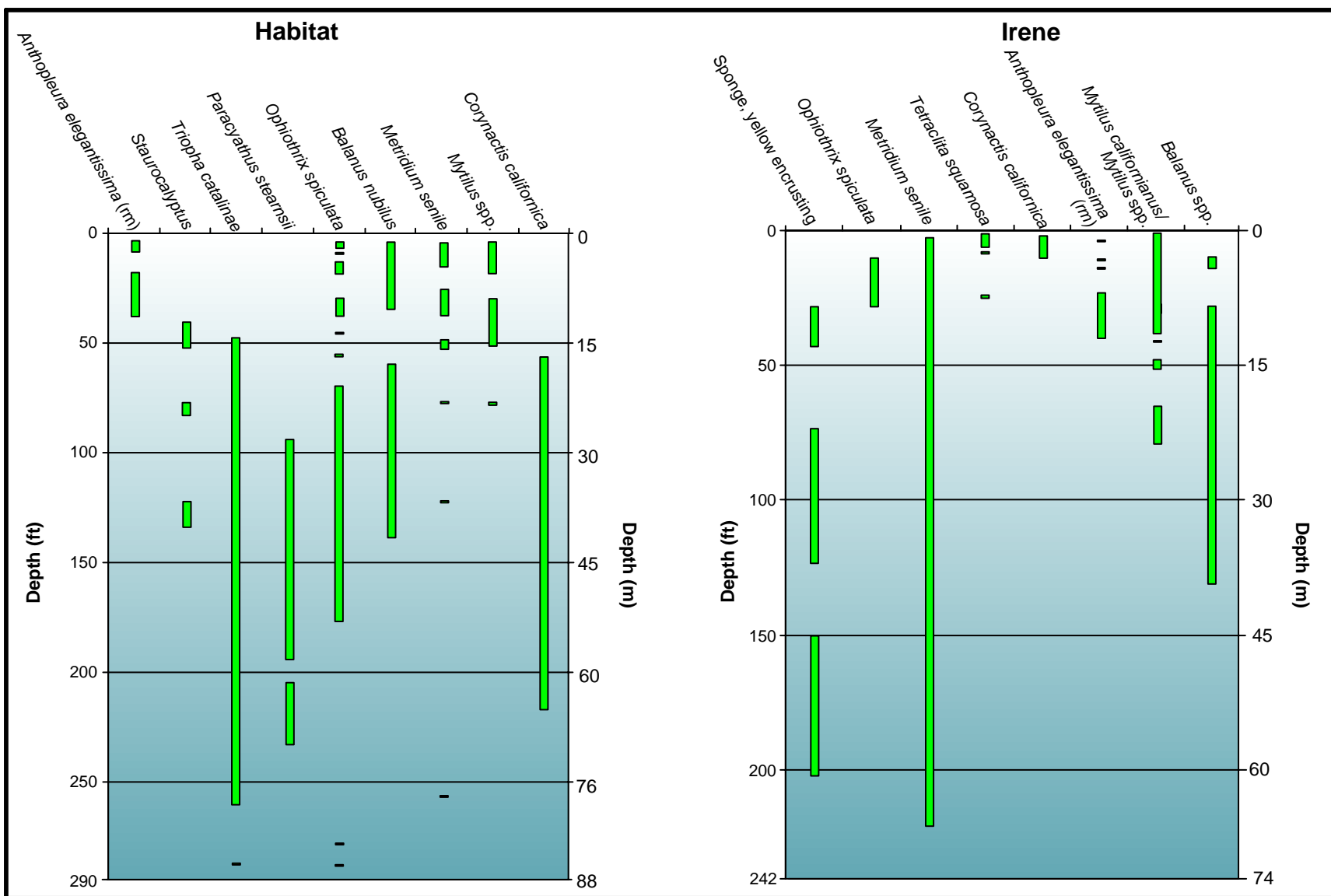


Figure 4-3. Generalized depth distribution of dominant species present at platforms Habitat and Irene.

Species presence by depth, as depicted in **Figures 4-1** through **4-3**, was derived from **Appendix C** and **Tables 3-3** through **3-12**. While the terminal points of each bar in the figures correctly note minimum and maximum depths of occurrence, a species presence across the entire depth range may be suggested but was not confirmed.

In general terms, the zonation patterns of all California platforms may be outlined as follows:

- an **upper zone** (from the intertidal to 18 to 26 m [60 to 85 ft]), including the intertidal and mussel bed, and consisting of *Mytilus* spp., various algae (e.g., filamentous and foliose red algae, several green algal species such as *Ulva*), barnacles, several anemone species (e.g., *Anthopleura elegantissima*, *Metridium senile*), sponges, and ophiuroids;
- a **mid zone** (from 19 to 26 m [65 to 85 ft] to about 76 m [250 ft]), including *Corynactis californica*, ophiuroids, barnacles, *Metridium senile*, *Leucetta/Leucetta losangelensis*, and worm tubes; and
- a **lower zone** (below 76 m [250 ft]), including *Metridium senile*, *M. farcimen*, *Paracyathus stearnsii*, turf, and worm tubes. Platform- or platform group-specific taxa may also be present in the lower zone (e.g., *Desmophyllum dianthus* only at Platform Gail; red encruster only at platforms Harvest, Hidalgo, and Irene).

4.6 Scraping Analysis

The scraping analysis encompassed complete taxonomic identification and determination of relative abundance of all species present within each 0.0625 m² quadrat collected from Platform Harvest (Legs B1 and B2) and Platform Gail (Legs A1 and B1). In addition, mussel samples (whole community and mussels only) were weighed, and individual mussels weighed and measured.

A total of 23 scraping samples were collected from Platform Harvest, consisting of four samples from the barnacle zone and eight samples from the *Mytilus* zone of Leg B1, and three samples from the barnacle zone and eight samples from the *Mytilus* zone of Leg B2. Depth of collection on Platform Harvest ranged from 3.4 to 24.1 m (11 to 79 ft). A total of 31 scraping samples were collected from Platform Gail, consisting of five samples from the intertidal zone, six samples from the barnacle/scallop zone, and six samples from the *Mytilus* zone of Leg A1, and three samples from the intertidal zone, two samples from the barnacle/scallop zone, and nine samples from the *Mytilus* zone of Leg B1. Depth of collection ranged on Platform Gail ranged from 0.3 to 24.1 m (1 to 79 ft).

At Platform Harvest, 130 total taxa were identified. Dominant taxa included ophiuroids (*Ophiothrix spiculata*), algae (*Rhodomyenia californica*, *Membranoptera multiramosa*), mollusks (*Mytilus* spp., *Mytilus californianus*, *Hiatella arctica*), caprellid and gammarid amphipods (*Caprella alaskana*, *Elasmopus* cf. *holgurus*), barnacles (*Megabalanus californicus*, *Balanus nubilus*), polychaetes (*Halosydna brevisetosa*, *Syllis gracilis*), and anthozoans (*Metridium senile*), among others. Several species, including *Ophiothrix spiculata*, *Caprella alaskana*, *Elasmopus* cf. *holgurus*, *Pycnogonum stearnsi*, and *Hiatella arctica*, were present in all 23 scraping samples. Other species, such as *Rhodomyenia californica*, *Mytilus* spp., *Membranoptera multiramosa*, *Megabalanus californicus*,

and *Halosydna brevisetosa*, were very abundant when they occurred, but were not always present.

At Platform Gail, 90 total taxa were identified. Dominant taxa included algae (*Pterosiphonia dendroidea*), anthozoans (*Anthopleura elegantissima*, *Metridium senile*, *Metridium exilis*, *Diadumene cincta*), caprellid amphipods (*Caprella equilibra*), polychaetes (*Spirobranchus spinosus*, *Elasmopus holgurus*), ophiuroids (*Ophiothrix spiculata*), mollusks (*Chama arcana*), sponges (*Haplosclerida*), and barnacles (*Balanus trigonus*). Several species, including *Elasmopus holgurus* and *Balanus trigonus*, were present in all 31 scraping samples. Other species, such as *Ophiothrix spiculata*, *Pterosiphonia dendroidea*, *Spirobranchus spinosus*, *Metridium exilis*, *Chama arcana*, and *Spirobranchus spinosus*, were very abundant when present, but were not consistently present in all scraping samples. *Mytilus* spp., which was sparse on Leg A1, was a dominant species on Leg B1.

The complex, three-dimensional structure of the barnacle and *Mytilus* zones provide habitat and protection for a variety of interstitial fauna and epibionts, including caprellid and gammarid amphipods, crabs, pycnogonids, brittle stars, holothuroids, gastropods, bivalves, nudibranchs, chitons, polychaetes, anemones, hydroids, hydrozoans, nemerteans, sponges, bryozoans, tunicates, sipunculids, and flatworms. In total, 181 separate taxonomic entities were noted from scrapings at both platforms, of which 123 (68%) were monospecific taxa (i.e., identification to species level). Of this total, only 22 percent (41) of the taxa co-occurred within the sampled portions of both platforms Gail and Harvest. Co-occurring taxa represented all of the major phylogenetic groups (**Table 4-12**).

Several of the species identified in the scraping analysis were also noted as density- and/or percent cover-dominant taxa during QSA (e.g., *Mytilus*, *Balanus*, *Metridium*, *Anthopleura*, *Ophiothrix*). The majority of the taxa observed in the scraping samples, however, were either cryptic or juvenile forms not readily identifiable during the analysis of photographs.

Mussel bed thickness is a major factor affecting species diversity within the *Mytilus* zone. According to Seed and Suchanek (1992), increases in mussel bed thickness dramatically change the microhabitats present under, between, and around the mussels. While the bottom layer of mussels act as the primary point of attachment to the substrate (i.e., platform legs), subsequent mussel layers serve to strengthen the mussel bed through interconnecting byssal threads, creating a complex of interstitial spaces. These complex interstitial and epibiont spaces provide habitat, food, and protection for many cryptic species. Of particular note were the abundant crustaceans (including barnacles, caprellid and gammarid amphipods, crabs, isopods, sea spiders, and mysids), polychaetes, and mollusks, most of which were not visible in the photographic analysis. Potential contributors to undifferentiated assemblages (e.g., turf) may also be present in the scraping results, including various species of bryozoans, hydrozoans, algae, and hydroids.

Table 4-12. Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of platforms Gail and Harvest. Taxa common to both platforms denoted in bold.

<p>FLORA: Algae: <i>Acrosorium venulosum</i> <i>Antithamnion hubbsii</i> <i>Branchioglossum bipinnatifidum</i> <i>Callophyllis</i> spp. <i>Ceramium camouii</i> Delesseriaceae, unidentified <i>Heterosiphonia japonica?</i> ¹ <i>Membranoptera multiramosa</i> ² <i>Polysiphonia scopularum</i> <i>Pterosiphonia dendroidea</i> <i>Pugetia fragillissima</i> <i>Pugetia</i> spp. (juvenile) <i>Rhodymenia californica</i> <i>Rhodymenia pacifica</i></p> <p>FAUNA: Crustaceans: Barnacles (Cirripedia): <i>Balanus nubilis</i> <i>Balanus</i> spp. (juvenile) <i>Balanus trigonus</i> <i>Megabalanus californicus</i> <i>Tetraclita rubescens</i></p> <p>Caprellid amphipods: <i>Caprella alaskana</i> <i>Caprella equilibra</i> <i>Caprella ferrea</i> <i>Caprella verrucosa</i></p> <p>Gammarid amphipods: <i>Aoroides</i> spp. <i>Dulichieilla appendiculata</i> <i>Elasmopus</i> cf. <i>holgurus</i> <i>Elasmopus holgurus</i> <i>Erichthonius brasiliensis</i> <i>Gammaropsis thompsoni</i></p>	<p>Gammarid amphipods, continued: <i>Janiralata occidentalis</i> <i>Jassa slatteryi</i> <i>Leucothoe alata</i> <i>Monocorophium</i> spp. <i>Parapleustes pugettensis</i> <i>Podocerus brasiliensis</i> <i>Quadrimaera reishi</i> cf. <i>Sinocorophium</i> spp. <i>Stenothoe estacola</i></p> <p>Crabs (Brachyura, Cancridae): <i>Cancer branneri</i> <i>Cancer jordani</i> <i>Cancer productus</i> <i>Cancer</i> spp. (juvenile) <i>Maera simile</i> <i>Pachycheles pubescens</i> <i>Pachycheles rudis</i> <i>Pachygrapsus crassipes</i> <i>Paraxanthias taylori</i> <i>Pilumnus spinohirsutus</i> <i>Podocerus brasiliensis</i> <i>Scyra acutifrons</i></p> <p>Isopods (Isopoda): <i>Janiropsis tridens</i></p> <p>Sea spiders (Pycnogonida): <i>Anoplodactylus nodosus</i> Pycnogonida, unidentified (juvenile) <i>Pycnogonum stearnsi</i></p> <p>Mysids (Mysidacea): Mysidacea, unidentified (fragment)</p> <p>Echinoderms: Brittle stars (Ophiuroidea): <i>Ophiactis simplex</i> <i>Ophiopteris papillosa</i> <i>Ophiothrix spiculata</i> Ophiuroidea, unidentified (juvenile)</p>	<p>Holothuroids (Holothuroidea): Holothuroidea, unidentified Holothuroidea, unidentified (juvenile) <i>Parastichopus californicus</i> <i>Pentamera lissoplaca</i></p> <p>Urchins (Echinoidea): Echinoidea, unidentified (juvenile) <i>Lytechinus pictus</i> <i>Strongylocentrotus purpuratus</i></p> <p>Mollusks: Bivalves (Pelecypoda): <i>Anomia peruviana</i> <i>Chama arcana</i> <i>Crassadoma gigantea</i> <i>Crassostrea gigas</i> <i>Gregariella chenui</i> <i>Gregariella coarctata</i> <i>Hiatella arctica</i> <i>Irus lamellifer</i> <i>Kellia suborbicularis</i> <i>Lithophaga plumula</i> <i>Modiolus capax</i> <i>Mya arenaria</i> <i>Musculus (=Musculista) spp.</i> <i>Mytilus californianus</i> <i>Mytilus</i> spp. <i>Mytilus</i> spp. (juvenile) <i>Mytilus trossulus/galloprovincialis</i> <i>Ostrea conchaphila</i> <i>Petricola</i> spp. (juvenile) <i>Pododesmus cepio</i> <i>Pseudochama exogyra</i></p> <p>Gastropods (Gastropoda): <i>Amphissa reticulata</i> (dead) <i>Amphissa versicolor</i> <i>Anisodoris nobilis</i> Doridacea, unidentified <i>Iselica ovoidea</i></p>
---	--	---

Table 4-12. Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of platforms Gail and Harvest. Taxa common to both platforms denoted in bold (continued).

<p>Gastropods (continued): <i>Iselica</i> spp. <i>Seila montereyensis</i> <i>Tritonia diomedea</i></p> <p>Chitons (Polyplacaphores): <i>Mopalia porifera</i></p> <p>Polychaetes: <i>Arabella iricolor</i> <i>Arabella semimaculata</i> <i>Brania</i> spp. <i>Cirratulus</i>, unidentified <i>Dodecaceria concharum</i> <i>Dodecaceria fewkesi</i> <i>Dodecaceria</i>, unidentified <i>Eudistylia polymorpha</i> <i>Halosydna brevisetosa</i> <i>Halosydna johnsoni</i> <i>Harmothoe ? hirsuta</i> <i>Harmothoe</i> spp. <i>Lepidonotus spiculus</i> <i>Myxicola</i> spp. <i>Naineris dendritica</i> <i>Nereis eakini</i> <i>Nereis mendocinana</i> <i>Nereis pelagica neonigripes</i> <i>Paleanotus bellis</i> <i>Pholooides asperus</i> <i>Phyllochaetopterus prolifica</i> <i>Phyllodoce medipapillata</i> <i>Phyllodoce</i> spp. <i>Polydora</i> spp. <i>Proceraea</i> cf. <i>kiiensis</i> <i>Proceraea</i> spp. Sabellidae, unidentified <i>Serpula columbiana</i> <i>Spirobranchus spinosus</i> Syllidae, unidentified <i>Syllis gracilis</i></p>	<p>Polychaetes (continued): <i>Trypanosyllis</i> spp. <i>Typosyllis</i> spp.</p> <p>Cnidarians: Anthozoans (Actiniaria): Actiniidae, unidentified <i>Anthopleura elegantissima</i> (rosy morph) <i>Anthopleura elegantissima</i> <i>Corynactis californica</i> <i>Diadumene cincta</i> <i>Metridium exilis</i> <i>Metridium senile</i></p> <p>Hydrozoans: <i>Campanularia</i> spp. Campanulariidae, unidentified <i>Eucopella everta</i> <i>Filellum serpens</i> <i>Halecium</i> spp. <i>Halecium tenellum</i> <i>Lafoea adnata</i> <i>Obelia geniculata</i> <i>Obelia</i> nr. <i>surcularis</i> <i>Obelia plicata</i> <i>Obelia</i> spp. <i>Plumularia alicia</i> <i>Plumularia alicia</i> complex <i>Plumularia</i> nr. <i>septata</i> <i>Plumularia</i> spp. <i>Sertularella tenella</i> <i>Syncoryne eximia</i></p> <p>Minor Phyla: Bryozoans (Ectoprocta or Bryozoa): <i>Callopora</i> spp. <i>Celleporella</i> spp. <i>Celleporina</i> spp. <i>Costazia</i> spp. <i>Crisia</i> spp. Cyclostomata, unidentified</p>	<p>Bryozoans, continued: Ectoprocta, unidentified <i>Filicrisia</i> spp. <i>Scrupocellaria</i> spp. <i>Tegella</i> spp.</p> <p>Flatworms (Platyhelminthes): Rhabdoceola, unidentified <i>Stylochoplana longipenis</i> <i>Stylochus</i> spp.</p> <p>Nemerteans (Nemertea): <i>Amphiporus</i> spp. <i>Carinoma mutabilis</i> <i>Lineus rubescens</i> Nemertea, unidentified <i>Paranemertes californica</i> <i>Tetrastemma signifer</i></p> <p>Sipunculids (Sipunculida): <i>Phascolosoma agassizi</i></p> <p>Sponges (Porifera): <i>Haplosclerida</i> nr. <i>Haliclona</i> spp. Porifera sp. A Porifera, unidentified <i>Rhabdodermella nuttingi</i></p> <p>Tunicates (Urochordata, Ascidiacea): <i>Aplidium</i> spp. Aplousobranchia (Diplosoma), unidentified <i>Styela coriacea</i> <i>Styela truncata</i> Tunicate, unidentified</p> <p>Total: 181 taxonomic entries, including 123 monospecific taxa (68%)</p> <p>Footnotes: 1 - <i>Heterosiphonia japonica</i>? Yendo = <i>Heterosiphonia densiuscula</i> Kylin, per Miller (2004); 2 - <i>Membranoptera multimarosa</i> Gardner = <i>Membranoptera platylphylla</i> (Setchell & Gardner) Kylin, per Miller (2004).</p>
--	--	--

Results of the scraping analysis also provided further taxonomic clarification for unidentified biota observed during photographic analysis. *Ophiothrix spiculata* and *Ophiopterus papillosa* were the only two ophiuroid species identified during scraping analysis from Platform Harvest. During the QSA, specimen size, photographic resolution, and/or a lack of specimens upon which a detailed analysis could be conducted resulted in the classification of unidentified ophiuroids in many of the photographs. Scraping analysis results allowed for a complete species-level determination; ophiuroids present in photographs from Platform Harvest were considered to be *Ophiothrix spiculata*, among the dominant taxa at all platforms.

The vast majority of algal taxa from the scraping samples were rhodophytes (red algae). During photographic analyses, red algae (i.e., both filamentous and foliose forms) were prominent, depth-dependent groups observed on nearly all of the platforms. Scraping results from Platform Gail indicate that filamentous red algal species include *Antithamnion hubbsii*, *Polysiphonia scopularum*, and *Pterosiphonia dendroidea*. Foliose red algal taxa from Platform Gail include *Callophyllis* spp., while foliose forms from Platform Harvest include *Rhodymenia californica*, and *R. pacifica*.

Correspondence analysis of the scraping data set from Platform Harvest revealed that the two zones, *Mytilus* and barnacle, were distinct in terms of their respective taxonomic compositions. Further, the taxonomic composition of the *Mytilus* zone was more variable than the barnacle zone.

Numerous taxa occurred exclusively in the *Mytilus* zone, but only in a few of the scraping samples. While *Mytilus californianus* occurred in most of the scraping samples collected in the *Mytilus* zone, it was also present in a number of samples collected in the barnacle zone, suggesting that there was a gradual transition between these zones. Taxa that occurred exclusively in this zone and more frequently were *Phascolosoma agassizi*, *Halecium* spp., *Callopora* spp., *Anthopleura elegantissima* (rosy morph), *Celleporella* spp., and *Filellum serpens*. The barnacles *Balanus nubilus* and *B. trigonus* occur frequently but not exclusively in the samples collected in the barnacle zone. Several species occurred exclusively in the barnacle zone: *Aoroides* spp., *Brania* spp., *Cancer branneri*, *Cancer jordani*, *Erichthonius brasiliensis*, *Gregariella chenui*, *Myxicola* spp., *Pholoides asperus*, and *Typosyllis* spp.

Wet weight determinations of scraping samples from Platform Harvest were variable. Total sample wet weights on Leg B1 ranged from 149 to 5,059 g per quadrat (2.4 to 80.9 kg/m²), with a mean value of 2,129 g (34 kg/m²). Total sample weights on adjacent Leg B2 were noticeably higher, ranging from 2,281 to 25,966 g per quadrat (36.5 to 415.5 kg/m²); the average total sample wet weight on this leg was 9,180 g (147 kg/m²).

Mussel only biomass measurements (i.e., wet weight, shell included) exhibited similar variability, affecting the relative mussel contribution (biomass) to the community. Mussel wet weights on Leg B1 ranged from 0 to 4,025 g (0 to 64.4 kg/m²). The contribution of mussel biomass to total wet weight was extremely variable, ranging from 0 to 80 percent, with an average of 12.8 percent for the 12 samples measured from Leg B1. In contrast, mussel only wet weights from the Leg B2 mussel zone were consistently high, ranging from 3,752 to 17,779 g (60.0 to 284.5 kg/m²). The relative contribution of mussel biomass to total sample wet weight on Leg B2 was consistently high (64 percent to 81 percent) for samples taken from the mussel

zone. However, as expected, mussel wet weight contributions were extremely limited (<1 percent) in the barnacle zone of Leg B2.

Highest biomass values for mussels were observed between 3.4 and 5.8 m (11 and 19 ft), tapering off below 6.1 m (20 ft). This observation was generally consistent with results of the whole slide analysis, where highest numbers of mussels on Leg B1 were encountered between 1.8 and 3.0 m (6 and 10 ft), tapering off below 3.7 m (12 ft). On Leg B2, highest densities were seen between 2.1 and 7.3 m (7 and 24 ft), tapering off below 7.9 m (26 ft).

A total of 932 mussels were measured and weighed from 13 samples collected from the mussel zone of Legs B1 and B2 of Platform Harvest. The number of mussels present in each sample was extremely variable, ranging from four mussels collected at 6 m (20 ft) below the surface on Leg B1 to 167 mussels collected at 5 m (15 ft) on Leg B2. From the whole slide analysis, the maximum number of mussels observed on Leg B2 within a single photograph was 110 individuals at 0.6 m (2 ft) water depth, underscoring one of the inherent limitations in using photographic analysis to count individuals present in a complex, three-dimensional community.

Mussel size characteristics were also quite variable. Minimum and maximum average lengths, widths, and heights were 3.81 and 9.90 cm, 2.25 and 4.48 cm, and 1.67 to 3.42 cm, respectively. Individual average weights were also variable, ranging from 10.78 to 111.42 g. The smallest mussels were collected at water depths where the fewest mussels were available (i.e., 6 to 8 m; 20 to 25 ft) on Leg B1, while the larger mussel specimens were present in the 3 to 8 m (10 to 22 ft) depths of Leg B2.

4.7 Growth Thickness Measurements

Growth thickness measurements were made periodically within the mussel zones at Platform Harvest (Legs B1 and B2) and Irene (Leg A1). Thickness measures ranged from 5.1 to 30.5 cm (2 to 12 inches). Greatest thickness of the mussel zone occurred at the 14.3 to 16.5 m (47 to 54 ft) on Harvest Leg B1, at 6.7 m (22 ft) on Harvest Leg B2, and 0.3 to 2.7 m (1 to 9 ft) on Irene Leg A1 (**Figure 4-4**).

The vertical extent of the mussel zone at Platform Harvest extended from the intertidal to 24 m (79 ft) on Leg B1 and to more than 16 m (60 ft) on Leg B2. The mussel bed thickness measurements at Platform Harvest occurred during the scraping collections, the latter of which were conducted separately from photographic (i.e., diver and ROV) data acquisition. As a result, the maximum depth of occurrence of mussels on Platform Harvest was different between the two data sets (i.e., maximum depth of occurrence in photographs: 14 m, 46 ft; maximum depth of occurrence in growth thickness/scraping data: 24 m, 79 ft). The maximum mussel thickness on Leg B1 was eight inches (20.3 cm), and typically in the three to four inch (7.6 to 10.2 cm) range; maximum thickness occurred at 14.3 to 16.5 m (47 to 54 ft) water depths. The maximum mussel thickness on Leg B2 was 12 inches (30.5 cm), and typically in the 6 to 10 inch (15.2 to 25.4 cm) range; maximum thickness occurred at 6.7 m (22 ft) water depths.

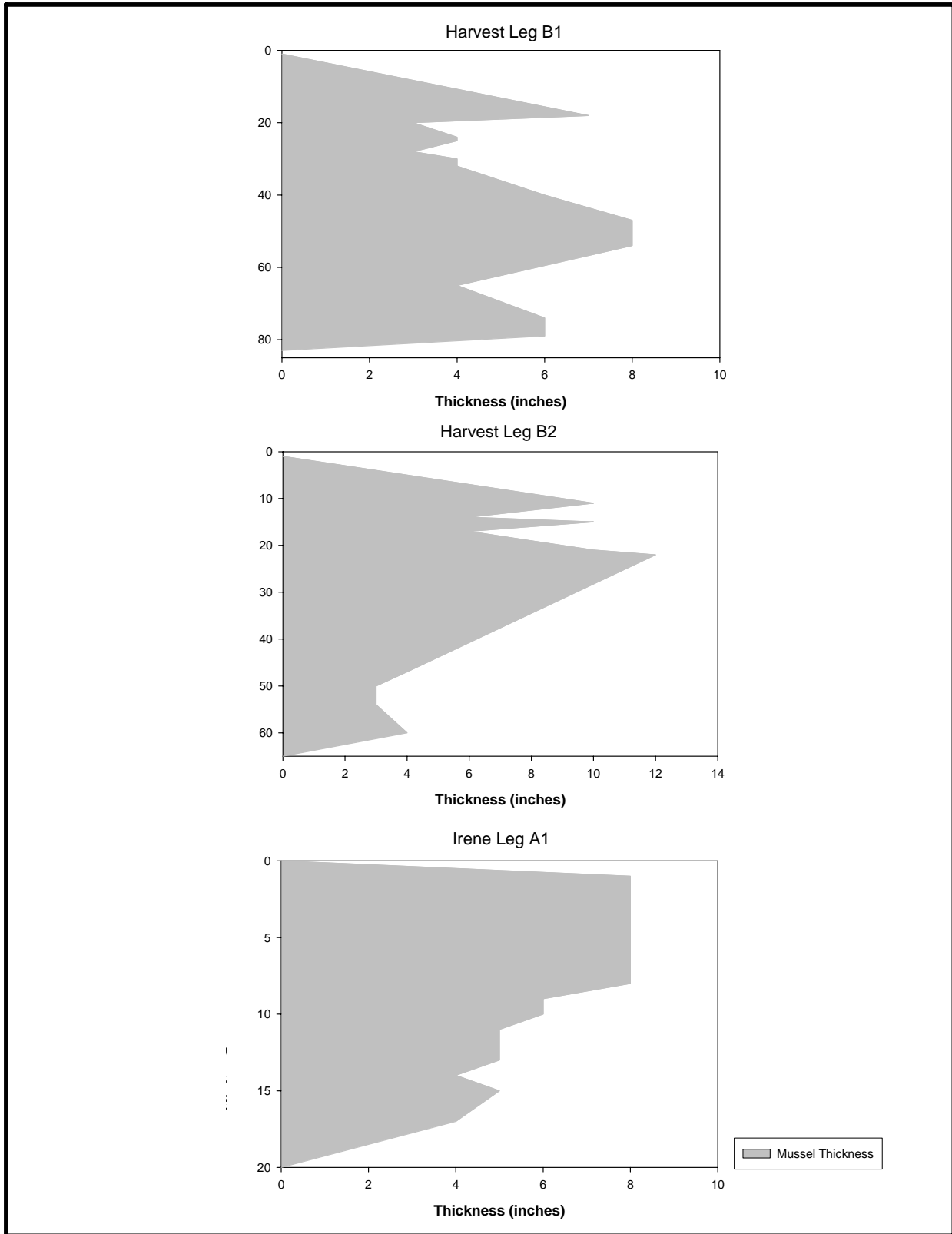


Figure 4-4. Mussel thickness at platforms Harvest and Irene.

Differences in the depths of maximum thickness between Legs B1 and B2 may be attributed to the fact that Leg B2 is an inner leg, protected on three sides by adjacent legs, whereas Leg B1 is an outer leg. Sloughing of the mussel mat is a common occurrence on platforms, particularly following the passage of storms, as evidenced by the presence of a shell mound at the base (and downcurrent) of each platform.

The vertical extent of the mussel zone at Platform Irene, based on photographic data, extended from the intertidal to 9 m (31 ft), with a small aggregation at 15 to 16 m (48 to 51 ft). At greater depths, there was no multi-layer mussel mat, only mussel clumps. At approximately 6 m (20 ft), mussel mat thickness dropped to a single layer. The maximum mussel thickness on Leg A1 was eight inches (20.3 cm), and typically in the five- to six-inch (12.7- to 15.2-cm) range; maximum thickness occurred in the upper portions of the platform leg, in a depth range of 0.3 to 2.7 m (1 to 9 ft). This mussel distribution was different from that evident at Platform Harvest, where mussel thickness in the intertidal region was lower than that found at depth.

4.8 Platform vs. Natural Hard Bottom – Comparisons of Biota

Previous regional characterizations of California's hard bottom fauna offer insight into the community composition of hard bottom features found at depth (e.g., low to high relief rock outcrops, generally 1 to 3+ m above the seafloor, at various water depths). Several previous studies and study summaries (e.g., Steinhauer and Imamura, 1990; Blake and Lissner, 1993; Science Applications International Corporation and Marine Ecological Consultants, 1995) have identified characteristic hard substrate taxa. The 30 most frequently encountered megabenthic taxa occurring on hard substrate in the western Santa Barbara Channel and Santa Maria Basin were represented by five phyla – Porifera (sponges), Cnidaria (anthozoans), decapod crustaceans, brachiopods, and echinoderms (i.e., crinoids, holothuroids, echinoids/urchins, asteroids/sea stars, and ophiuroids). Blake and Lissner (1993) noted that the spatial distribution of hard bottom communities reflected varying degrees of zonation pattern by depth. They noted that within OCS waters (i.e., ranging from 100 to 500 m water depths), almost half of the dominant or characteristic megafauna were eurybenthic.

A comparison of characteristic platform fauna (from the photographs; platform water depths ranged from 74 to 225 m) and the characteristic hard bottom fauna identified and enumerated in the western Santa Barbara Channel and Santa Maria Basin has been provided in **Table 4-13**. Thirteen of the 30 natural hard bottom megafauna taxa also occur on the platforms, however, nearly half of these taxa occurred only once (i.e., sole occurrence on a single platform). Most frequently encountered species include *Metridium farcimen* and a tan zoanthid. The zoanthid depth distribution was across the entire platform leg depth. *M. farcimen* depth distribution was more restricted. For a limited number of species which occur at both platforms and hard bottom features (e.g., *Galathea californiensis*), respective depth distributions were similar. Depth distribution for other species was confounding and no apparent trends were evident.

Table 4-13. Presence and depth of occurrence of species found both on platforms and natural hard bottom areas. Characteristic megabenthic invertebrate taxa from hard bottom features (as reported by Blake and Lissner, 1993) are within the western Santa Barbara Channel and Santa Maria Basin.

Taxon	Platforms		Natural Hard Substrate		
	Presence (No. of Platforms)	Depth of Occurrence [m (ft)]	Shallow (100-200 m)	Mid-Depth (200-300 m)	Deep (300-500 m)
Crustaceans					
<i>Galathea californiensis</i>	2	140-223 (459-733)	+	x	-
Echinoderms					
<i>Alloctrotus fragilis</i>	1	207 (680)	+	+	+
<i>Florometra serratissima</i>	1	94-111 (309-363)	+	+	+
<i>Ophiocantha diplasia</i>	1	140-208 (459-684)	+	+	+
<i>Parastichopus californicus</i>	2	37; 44; 60; 71 (120; 144; 196; 232)	+	+	+
<i>Stylasterias forreri</i>	4	76; 78; 94; 126; 128; 204; 210; 217; 223 (248, 249; 257; 310; 412; 421; 669; 713; 734)	+	+	+
Cnidarians					
<i>Amphianthus californicus</i>	1	193 (633)	+	x	-
<i>Desmophyllum dianthus</i>	1	111; 125; 181-224 (363; 410; 594-734)	+	+	-
<i>Metridium farcimen</i>	5	9; 40-78; 83-84; 130-131; 201-224 (29-31; 130-255; 271-277; 427-431; 659-669)	+	+	+
<i>Paracyathus stearnsii</i>	4	2; 29-96; 126 (6; 94-315; 413)	x	+	-
Tan zoanthid	5	60; 78; 84-87; 91; 102, 119, 129, 189; 193; 208; 215; 223 (197; 255; 277-285; 299; 335; 392; 424; 620; 633; 684; 704; 732)	+	+	+
Porifera					
Encrusting sponge ¹	6	2, 12-76 (7-8, 41-250)	+	+	+
Vase sponge ²	4	12-74 (41-243)	+	x	+

¹ Encrusting sponges are diverse; several species were noted on the platforms (e.g., *Cliona*, *Leucetta*, *Polyclinum*). Data reflect presence and distribution of *Leucetta* and *Leucetta losangelensis* on the six platforms.

² Vase sponges include *Staurocalyptus* and *Leucilla*; data reflect presence and distribution for *Staurocalyptus* and *Leucilla*.

Key: + = present; x = most prominent depth; - = not present.

4.9 Summary

Four to six biotic zones per platform were determined from videotape analysis. The total number of biotic zones present was related to platform water depth – platforms in shallower water exhibited four or five zones, whereas platforms in deeper water were characterized by the presence of six biotic zones. Zones, typically named for the predominant species or taxon present (e.g., mussel or *Mytilus* zone), were generally supported by the results of the field surveys and subsequent photographic analyses, although there were noticeable differences in several instances.

Complete taxonomic identification and enumeration of species present on each of six platforms was completed through analysis of 799 35-mm slide transparencies collected via ROV and scuba diver. Both density estimates and percent cover estimates were developed during this phase of quantitative slide analysis. For the primary platforms (i.e., platforms Gail, Grace, Harvest, and Hidalgo), where two legs were sampled, 665 images were reviewed. For the secondary platforms (i.e., platforms Habitat and Irene), where a single leg was evaluated, 134 photographs were reviewed. At Diablo and Nifty Rocks, 22 photographs acquired within scuba diving depths (i.e., from 5 to 17 m [15 to 55 ft]) were also analyzed. In total, 821 35-mm slides were reviewed during quantitative slide analysis.

Based on quantitative slide analysis of six platforms and Diablo and Nifty Rocks, 173 total taxa were observed (**Table 4-14**). Phylogenetic groups represented included algae (predominantly red filamentous and foliose forms), crustaceans (e.g., barnacles, decapod and galatheid crabs), echinoderms (e.g., ophiuroids, sea stars, holothuroids), mollusks (e.g., bivalves, gastropods, nudibranchs), polychaetes, cnidarians (e.g., anthozoans, hexacorals, hydrozoans, hydroids, zoanthids), and minor phyla (e.g., sponges, bryozoans, tunicates).

The total number of taxa identified at the six platforms ranged between 39 and 74, including between 15 and 30 monospecific identifications (i.e., to species level). Platform Gail exhibited the highest number of taxa, while Platform Irene exhibited the fewest. Summary findings of total taxa identified, numbers of monospecific taxa, and the percentage of the total which were monospecific, as determined from QSA, are detailed below:

<u>Platform</u>	<u>Total Taxa</u>	<u>Monospecific</u>	<u>Percent of Total Monospecific</u>
Gail	74	30	41
Grace	61	22	36
Harvest	53	18	34
Hidalgo	53	21	37
Habitat	42	15	36
Irene	39	16	41

Overall, QSA resulted in the photographic identification 34 to 41 percent of the platform taxa present to species level. Total number of taxa was highest among the primary platforms, where two platform legs were evaluated, suggesting that further sampling at either primary or secondary platforms would have resulted in the identification of additional taxa.

Table 4-14. Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks. Dominant species or taxa, as determined via ranking of the top 12 taxa by density or percent cover, noted in bold type; dominant species shown separately for platforms (P), rock outcrops (R), or both (P+R).

<p>FLORA: Algae: Alga, brown, blade Alga, brown, clump Alga, coralline, encrusting Alga, encrusting (<i>Lithothamnion</i>) (R) Alga, green clump Alga, green clump (<i>Codium</i>-like) (R) Alga, green encrusting (P) Alga, green filamentous Algae, red filamentous (P+R) Algae, red foliose (P) <i>Bossiella</i> spp. (R) <i>Codium</i> spp. <i>Corallina</i> spp. (P) <i>Egregia</i> spp. <i>Rhodomenia ?lobata</i> <i>Rhodomenia</i> spp. <i>Ulva lactuca</i> (P)</p> <p><i>Note: Algae broadly characterized due to limitations of photographic resolution and interpretation.</i></p> <p>FAUNA: Crustaceans: Barnacles (Cirripedia): <i>Balanus nubilus</i> (P) <i>Balanus</i> spp. (P+R) Barnacle, unidentified <i>Chthamalus</i> spp. (R) <i>Pollicipes polymerus</i> (P) <i>Tetraclita squamosa</i> (P)</p> <p>Decapod crabs (Decapoda): <i>Cancer antennarius</i> <i>Cancer</i> spp. <i>Hemigrapsus nudus</i></p> <p>Galatheid crabs (Galatheididae): <i>Galathea californiensis</i></p>	<p>Echinoderms: Sea stars (Asteroidea): <i>Asterina miniata</i> (=Patiria) <i>Dermasterias imbricate</i> <i>Henricia leviuscula</i> <i>Henricia sanguinolenta</i> <i>Orthasterias koehleri</i> <i>Pisaster brevispinus</i> <i>Pisaster giganteus</i> <i>Pisaster ochraceus</i> (P) <i>Poraniopsis inflata</i> <i>Pycnopodia helianthoides</i> <i>Stylasterias forreri</i></p> <p>Urchins (Echinoidea): <i>Allocentrotus fragilis</i> <i>Lytechinus pictus</i> <i>Strongylocentrotus franciscanus</i> <i>Strongylocentrotus purpuratus</i> (R)</p> <p>Brittle stars (Ophiuroidea): <i>Amphipholis</i> spp. (P) <i>Ophiocantha diplasia</i> <i>Ophiothrix spiculata</i> (P+R) Ophiuroid, unidentified (P)</p> <p>Holothuroids (Holothuroidea): <i>Dendrochirotida</i>, unidentified (R) <i>Parastichopus californicus</i></p> <p>Crinoids (Crinoidea): <i>Florometra serratissima</i></p> <p>Mollusks: Bivalves (Pelecypoda): Anomiidae, unidentified Bivalve, nestling, unidentified <i>Chama arcana</i> <i>Crassadoma gigantea</i> Mytilidae, unidentified <i>Mytilus californianus</i> (P+R) <i>Mytilus</i> spp. (P)</p>	<p>Gastropods (Gastropoda): Aeolid (SF Aeolidiidae), unidentified <i>Aeolidia papillosa?</i> Aeolidioidea, unidentified <i>Anisodoris nobilis</i> <i>Archidoris montereyensis</i> <i>Calliostoma</i> spp. <i>Cypraea spadicea</i> <i>Dialula sandiegensis</i> Dorid, white, unidentified Dorid, yellow, unidentified (?<i>Doriopsilla</i>) Doridacea, unidentified <i>Flabellina iodinea</i> Gastropoda, unidentified <i>Hermisenda crassicornis</i> <i>Pleurobranchaea californica</i> <i>Serpulorbis</i> spp. <i>Triopha catalinae</i> (P)</p> <p>Chitons (Polyplacophora): Chiton, unidentified</p> <p>Polychaetes: <i>Eudistylia polymorpha</i> (P) Sabellidae/Serpulidae, unidentified (feather duster worm) <i>Protula superba</i> (P) <i>Salmacina</i> spp. Serpulidae, unidentified Spionidae, unidentified <i>Spirobranchus</i> spp. Tube worm, double spiral Tube worm, single fan Worm tubes, calcareous (P) Worm tubes, plain (P)</p>
--	--	---

Table 4-14. Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks. Dominant species or taxa, as determined via ranking of the top 12 taxa by density or percent cover, noted in bold type; dominant species shown separately for platforms (P), rock outcrops (R), or both (P+R) (continued).

<p>Cnidarians: Anthozoans (Actiniaria): Actiniaria, brown Actiniaria, pink <i>Amphianthus californicus</i> Anemone, pink Anemone, unidentified <i>Anthopleura elegantissima</i> (rosy morph) (P+R) <i>Anthopleura</i> spp. <i>Anthopleura</i> spp. (whitish, no rose) (P) <i>Anthopleura xanthogrammica</i> (R) Anthozoa, unidentified <i>Astrangia</i> spp. <i>Balanophyllia elegans</i> (R) <i>Coenocyathus bowersi</i> (P) <i>Corynactis californica</i> (P+R) Cup coral, white, unidentified <i>Desmophyllum dianthus</i> (P) <i>Epiactis prolifera</i>? Gorgonian, unidentified <i>Metridium exilis</i> (P) <i>Metridium farcimen</i> (P) <i>Metridium senile</i> (P+R) <i>Metridium</i> spp. (P) <i>Metridium</i> spp., dark or Feather Duster <i>Palythoa</i> (tan zoanthid) (P) <i>Palythoa</i> (tan) <i>Paracyathus stearnsii</i> (P) <i>Urticina</i> spp. Zoanthid (<i>Palythoa</i>) (P) Zoanthid, colonial tan (P) Zoanthid, solitary tan</p>	<p>Hydrozoans: Hydrozoa, colony Hydrozoa, tan clump <i>Plumularia</i> spp. (P) <i>Eudendrium</i> spp.? Hydroid, pink Hydroid, tan (P) Hydroid, tan branching (P) Hydroid, white</p> <p>Minor Phyla: Sponges (Porifera): <i>Cliona</i> spp., yellow <i>Halichondria panicea</i> (P) <i>Leucetta losangelensis</i> (P) <i>Leucilla nuttingi</i> <i>Leucetta</i> spp. (P) Sponge, gray encrusting (P) Sponge, green encrusting (P) Sponge, orange encrusting (P) Sponge, orange round Sponge, purple encrusting Sponge, tan cup (P) Sponge, tan encrusting (P) Sponge, tan foliose encrusting Sponge, tan globose Sponge, unidentified (R) Sponge, white encrusting (P) Sponge, white finger Sponge, yellow encrusting (P) <i>Staurocalyptus</i> spp. (P)</p> <p>Bryozoans (Bryozoa): Bryozoa, staghorn, yellow (R) Bryozoa, tan branching (P) Bryozoa, white branching <i>Bugula</i> spp. <i>Crisia/Filicrisia</i> spp. <i>Hippodiplosia</i> spp.</p>	<p>Tunicates (Urochordata, Ascidiacea): <i>Amaroucium</i> spp. <i>Aplidium</i> spp. <i>Botrylloides</i> spp. <i>Halocynthia igaboja</i> <i>Styela</i> spp. Tunicate, encrusting tan (P) Tunicate, encrusting translucent (P) Tunicate, globular, unidentified Tunicate, solitary, unidentified Urochordata, unidentified</p> <p>Fishes (Osteichthyes): <i>Oxylebius pictus</i> <i>Sebastes</i> spp.</p> <p>Undifferentiated Assemblages and Encrusters: Algae/hydrozoa mix Bryozoa turf (P) Encruster, blue (P) Encruster, gray Encruster, green Encruster, lavender (P) Encruster, orange Encruster, pink Encruster, red (P) Encruster, tan (P) Encruster, white Encruster, yellow (P) Turf (P+R)</p> <p>Physical Characteristics: Bare metal (P) Line (P)</p> <p>Total: 173 taxa, including undifferentiated assemblages and encrusters, plus physical characteristics</p>
--	--	--

The rocky outcrops areas of Diablo and Nifty Rocks also exhibited 44 taxa during quantitative slide analysis, of which 14 were monospecific (i.e., 32 percent monospecific). Twenty-four of the taxa identified at Diablo and Nifty Rocks were not observed on the platforms. In spite of the restricted scope of photographic sampling conducted at Diablo and Nifty Rocks, it is suggested that species diversity at the natural rock outcroppings was higher than that seen in comparable depth zones at the six platforms, particularly for algal species which, by comparison, were under-represented on the platforms.

Point count analysis was also conducted on digital versions of the 35-mm slide set. Using PointCount'99® software, all images from the six platforms were evaluated and taxa present on 50 random points per image were identified to the lowest practical taxon. A total of 883 digital images were reviewed during point count analysis. Fifty-five taxa total were identified during the random point count analysis. Results of the point count analysis, expressed as percent cover estimates, were very consistent with percent cover data developed from the quantitative slide analysis, particularly for the dominant taxa. As expected, rare fauna were less frequently identified during random point count analysis than during whole slide analysis. Point count provides a straightforward means of identifying percent cover dominants within a photographic image, whereas whole slide analysis, based either on individual counts or percent cover estimates, provides a more comprehensive characterization of taxa present.

Seven taxa were present on all ten legs of the six platforms characterized. Taxa present and their density and/or percent cover contributions at all platforms included:

- *Metridium senile* – with average densities ranging from 10.8 to 330.9 individuals/0.0625 m² (maximum: 510 individuals/0.0625 m² at Platform Irene) and average coverage ranging from 3.7 to 66.0 percent (maximum: 98 percent at Platform Irene)
- *Mytilus* spp. – with average densities ranging from 24.3 to 117.8 individuals/0.0625 m² (maximum: 240 individuals/0.0625 m² at Platform Grace) and average coverage ranging from 19.2 to 60.4 percent (maximum: 100 percent at Platform Habitat)
- *Balanus* spp. – with average densities ranging from 2.5 to 42.0 individuals/0.0625 m² (maximum: 200 individuals/0.0625 m² at Platform Irene)
- Calcareous worm tubes – with average densities ranging from 1.0 to 51.5 individuals/0.0625 m² (maximum: 100 individuals/0.0625 m² at Platform Irene)
- Yellow encrusting sponge – with average coverage ranging from 0.5 to 16.1 percent (maximum: 70 percent at Platform Harvest)
- Tan encrusting sponge – with average coverage ranging from 4.0 to 32.4 percent (maximum: 60 percent at Platform Irene)
- Turf – with average coverage ranging from 6.0 to 37.4 percent (maximum: 97 percent at Platform Grace).

Bare metal was also present on all ten platform legs, primarily at depth, with average cover ranging from 7.5 to 49.2 percent; this physical characteristic was noticeably reduced at Platform Irene, present in only a few photographs near the base of the platform. As a result, no percent cover estimates for bare metal were made at this platform.

Other prominent taxa included *Corynactis californica*, *Anthopleura elegantissima* (rosy morph), *Ophiothrix spiculata*/ unidentified ophiuroid, *Metridium farcimen*, filamentous and foliose red algae, and *Leucetta/Leucetta losangelensis*.

Few trends suggested the existence of a north-south gradient in species composition, although a limited number of species were unique to southern or northern platforms. Eight taxa occurred exclusively at the southern platforms – Gail and Grace – including the nudibranchs *Anisodoris nobilis* and *Dialula sandiegensis*, *Metridium exilis*, the brittlestar *Amphipholis*, the hexacoral *Desmophyllum dianthus*, yellow *Cliona* and *Polyclinum planum* sponges, the hydroid *Obelia* spp., and *Styela* spp. Five taxa occurred exclusively at Habitat – the bryozoans *Bugula* and *Crisia/Filicrisia*, coralline alga (*Corallina*), the sponge *Staurocalyptus*, and the nudibranch *Triopha catalinae*. Nine taxa occurred exclusively at platforms in the southern Santa Maria Basin (Hidalgo, Harvest), including the nudibranchs *Aeolidia papillosa* and *Archidoris montereyensis*; the tunicates *Amaroucium* and *Botrylloides* spp.; the gastropod *Calliostoma* spp.; algae *Egregia* and *Rhodymenia*; the hydroid *Eudendrium* spp.; and sea star *Pisaster brevispinis*. Two taxa occurred exclusively at Platform Irene, including the urchin *Lytechinus pictus*, and the anemone *Epiactis prolifera*. Three taxa occurred at all of the northern platforms – the starfish *Pisaster ochraceus*; the gooseneck barnacle *Pollicipes polymerus*; and a red encruster.

In general, the biotic zones determined from videotape analysis were confirmed through the photographic analysis. Mussel zones were always present, although their vertical extent may have differed from those estimated from the videotape analysis. Dominant species or taxa found at intermediate depths and beyond were generally, but not always, consistent with the biotic zone designations. These findings may be related to the broad categories used in the videotape analysis (e.g., encrusters), may reflect differences inherent in comparing data sets acquired at different spatial scales, or may be attributed to changes in community composition over time. Overall, it was evident that there was considerable overlap in the depth distributions of major taxa (i.e., density- and percent cover-dominants).

Based on an overview of the photographic data, several broad characterizations were evident for the dominant taxa:

- *Mytilus* spp. and, to a lesser extent, *Mytilus californianus* were the predominant mussels on all platforms sampled, primarily because they have adapted to rough, open ocean conditions and exposure to powerful waves and currents. Occasionally, other Mytilidae were also noted. Based on photographic observations, an upper and a lower *Mytilus* community was evident. This zonation pattern was created by the presence of a prominent, umbrella-like upper portion of the mussel mass; below that mussel counts decreased rapidly due to the presence of a dense epifauna cover that hid the underlying mussel mat. The shape of the whole mussel mass was roughly spindle-like.
- Anemones and other anthozoan communities were an important faunal component of platform-associated communities, with depth-related distributions as follows:
 - *Anthopleura elegantissima* (rosy morph) and *A. xanthogrammica* in the shallower portions of the platform, typically within the mussel and/or barnacle zones;

- *Metridium senile*, *Paracyathus stearnsii*, *Coenocyathus bowersi*, and *Corynactis californica* from the bottom of the mussel zone to the mid-depth portions of each platform;
- *Metridium farcimen* and *Desmophyllum dianthus*, as well as various encrusters, in the lower portions of the deeper platforms (i.e., Gail, Harvest); and
- Unique taxa at select platforms, including *Metridium exilis* at platforms Gail and Grace.

In terms of anthozoan patterns discerned during this analysis, there were no obvious and distinct patterns evident. However, several casual observations were noteworthy. The mussel zone species assemblage and the mid zone species assemblage had major overlap (*M. senile*, *M. exilis*, *Coenocyathus bowersi*, *Corynactis californica*). In addition, the mussel zone had several co-occurring species including *Anthopleura elegantissima* (rosy morph) and *Urticina*, while the lower zones had *M. farcimen* and *Paracyathus stearnsii*.

- Algal species, as expected, were limited in their distribution to the shallower depths of the platforms. Identifiable algae that were present were dominated by filamentous and foliose red algal species, with minor contributions from green and coralline forms. A lower algal diversity was evident at the platforms when compared to natural rock outcrops.
- Barnacles were prominent and numerically dominant, typically within the upper portions of a platform. Several taxa were observed on the platforms, however, *Balanus* species (*Balanus* spp., *Balanus nubilus*) were prevalent.
- Ophiuroids, particularly *Ophiothrix spiculata*, were routine co-dominants (by density) in the upper portions of a platform, however, their depth of distribution extended into deeper water.

The general depth distribution and patterns of occurrence for the platform-associated dominant species is depicted graphically in **Figure 4-5**. Common observations included:

- *Mytilus* – comprised of *Mytilus* spp. and *M. californianus*, mussels were always present and were routinely density- and percent cover-dominants, typically occurring in a depth range that extended from the intertidal to 12 to 24 m (40 to 80 ft), co-occurring with barnacles, other anthozoans, ophiuroids, sponges, and red algae;
- *Metridium senile* – a major contributor to total density and percent cover, with an extensive depth distribution, routinely beyond that exhibited by ophiuroids; this species, like *Mytilus*, *Balanus*, calcareous worm tubes, turf, and a yellow encrusting sponge, was present on all platform legs sampled;
- Balanoids – a prominent and numerically dominant group including *Balanus nubilus*, *Balanus* spp., and, to a lesser extent, *Tetraclita squamosa*, that typically occurred within the upper portions of a platform (i.e., from the intertidal to a depth of 15 to 30 m [50 to 100 ft]), but was observed extending to depths of 60 m or more; this group frequently co-occurred with mussels, ophiuroids, and anemones in the *Mytilus* zone;

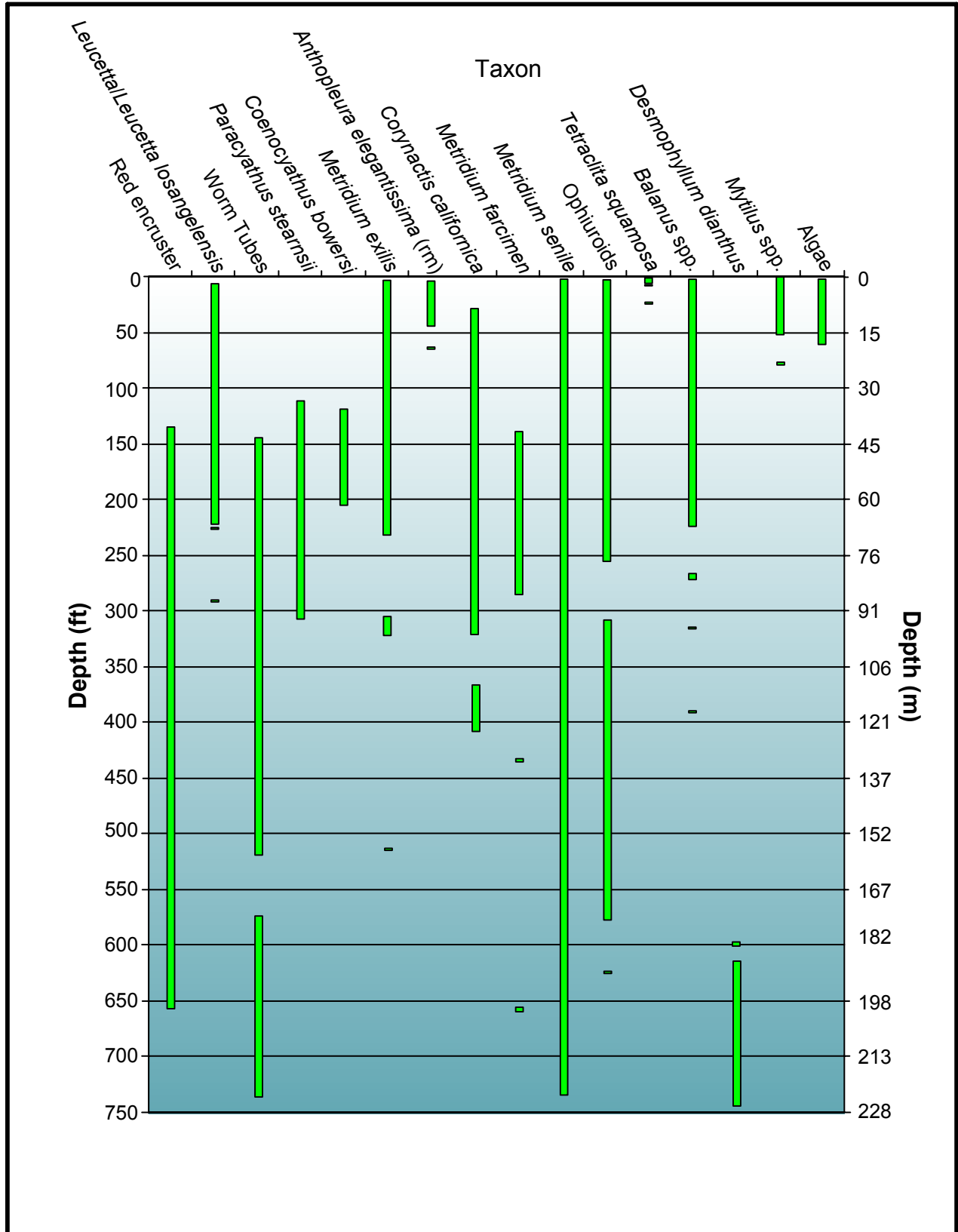


Figure 4-5. Generalized depth distribution of select biota - all platforms.

- Ophiuroids – a significant contributor (in terms of total density) with an extensive depth distribution, most often represented by unidentified ophiuroids and *Ophiothrix spiculata*; this group frequently co-occurred with mussels, barnacles, and anemones in the *Mytilus* zone, and with other anemones and encrusting forms at greater depths;
- Sponges – as a group, sponges were always present on the platforms, however, their identifiability was low; the most prominent sponge species encountered included a yellow encrusting species, a tan encrusting species, the calcareous sponge *Leucetta/Leucetta losangelensis*, and the hexactinellid sponge *Staurocalyptus*;
- Filamentous red algae – this group was nearly always found within the mussel zone, often to depths of 15 m (50 ft) or more and present on five of the six platforms; filamentous red algae included *Polysiphonia*, *Neoptilota*, and *Antithamnion*, among other species;
- *Anthopleura elegantissima* (rosy morph) and *A. xanthogrammica* – primarily intertidal and shallow subtidal, usually with the upper 15 m (50 ft) of a platform leg, routinely in association with mussels, other anthozoan species, barnacles, ophiuroids, and red algae;
- Calcareous worm tubes – common co-dominants occurring in the mid- to lower portions of a platform leg, generally between 46 and 76 m (150 and 250 ft) subsurface to near the platform base; maximum depth of occurrence for worm tubes was 213 m (700 ft).
- *Corynactis californica* – variable in density, this species was present on all of the platform legs (except Platform Hidalgo, Leg B1), usually below the mussel zone; this species depth distribution extended to approximately 122 m (400 ft);
- *Paracyathus stearnsii* – depth distribution primarily between 30 and 122 m (100 and 400 ft);
- *Desmophyllum dianthus* – only found on Platform Gail (both legs), at depths comparable to below basin sill;
- Red encruster – only found on platforms Harvest, Hidalgo, and Irene, at depth; and
- Encrusters – as a group, they were always present, but exhibit very low identifiability.

Mussel beds provide three dimensional, interstitial space for a complex community. Scraping results from the barnacle and mussel zones of Platform Harvest and Gail contained a total of 130 and 90 taxa, respectively, of which only 22 percent (41) of the taxa co-occurred. Scraping samples from Harvest were dominated *Ophiothrix spiculata*, *Rhodymenia californica*, *Mytilus* spp., *Membranoptera multiramosa*, *Caprella alaskana*, *Megabalanus californicus*, *Mytilus californianus*, *Halosydna brevisetosa*, *Elasmopus* cf. *holgurus*, and *Metridium senile*. Dominant taxa in the scraping samples from Gail included *Pterosiphonia dendroidea*, *Anthopleura elegantissima*, *Metridium senile*, *Spirobranchus spinosus*, *Ophiothrix spiculata*, *Elasmopus holgurus*, *Diadumene cincta*, *Balanus trigonus*, and *Metridium exilis*. Ophiuroids and barnacles were prominent taxa in both photographic and scraping samples.

Correspondence analysis of the scraping data set from Platform Harvest revealed that the two zones, *Mytilus* and barnacle, were distinct in terms of their respective taxonomic

compositions. Further, the taxonomic composition of the *Mytilus* zone was more variable than the barnacle zone.

Wet weight determinations of scraping samples from Platform Harvest were variable. Total sample wet weights ranged between 149 and 5,059 g per quadrat (2.4 and 80.9 kg/m²) on Leg B1, but were noticeably higher on the adjacent leg, where they ranged between 2,281 and 25,966 g per 0.0625 m² quadrat (36.5 to 415.5 kg/m²). Average total sample wet weights per quadrat on Leg B1 and B2 were 2,129 and 9,180 g (34 and 147 kg/m²), respectively.

Mussel only biomass measurements (i.e., wet weight, shell included) exhibited similar variability, affecting the relative mussel biomass contribution to the community. Mussel wet weights on Leg B1 ranged from 0 to 4,025 g (0 to 64.4 kg/m²). In contrast, mussel only wet weights from the Leg B2 mussel zone were consistently high, ranging from 3,752 to 17,779 g per quadrat (60.0 to 284.5 kg/m²). These results were generally consistent with results of the whole slide analysis, where highest densities and percent cover estimates were evident above 6 to 8 m water depths.

Minimum and maximum average lengths, widths, and heights for Platform Harvest mussels (932 count) were 3.81 and 9.90 cm, 2.25 and 4.48 cm, and 1.67 to 3.42 cm, respectively. Individual average weights were variable, ranging from 10.78 to 111.42 g. Smallest mussels were collected at water depths where the fewest mussels were available, while the larger mussel specimens were present in those portions of the platform leg where higher densities were evident.

Measurements of mussel bed thickness were completed at two platforms. The vertical extent of the mussel zone at each platform was variable. Maximum mussel thicknesses ranged from 8 to 12 inches (20.3 to 30.5 cm) at Platform Harvest, and 8 inches at Platform Irene; the depth of occurrence for maximum mussel bed thickness varied between the legs sampled. Differences in the depths of maximum thickness may be attributed to protection afforded by adjacent platform legs.

A review and comparison of the summary taxa listing from the photographic analysis and scraping identifications offered several interesting points of note. For the photographic analysis completed on six platforms and Diablo and Nifty Rocks, 173 total taxa were observed. Among these taxa there was a noted predominance of several phylogenetic groups, including cnidarians (e.g., anemones, hexacorals, hydrozoans, hydroids, and zoanthids), sponges (i.e., encrusting and upright forms), and echinoderms (e.g., ophiuroids, sea stars, urchins, a holothuroid, and a crinoid), as well as ubiquitous mussels. Photographic analysis also revealed a relatively low number of algal species, most of which were rhodophytes (red algae – Class Rhodophyceae).

For the scrapings analysis, no sea stars or urchins were observed, but a significant contribution from caprellid and gammarid amphipods, more bivalve species, several additional algal species, and a significant increase in the number of polychaete taxa and minor phyla (e.g., nemertean, bryozoans, sipunculids, and flatworms) were noted. These findings highlighted the complex nature and three-dimensional structure of the mussel and barnacle zones, and underscored one of the limitations inherent in photographic interpretation. This three-

dimensional structure provides an intricate network of interstitial space and affords habitat and protection for a variety of cryptic species.

Comparison of photographic and scraping samples taxa only resulted in limited species overlap. While several species were present in both photographic and scraping data, the scraping material was predominantly composed of smaller, more cryptic species (e.g., caprellid amphipods, gammarid amphipods, polychaetes, hydrozoans, bryozoans, nemerteans). Scrapings analysis and results allowed for a more detailed description of the platform-associated community at Platform Harvest and Gail.

In general terms, the zonation patterns of all California platforms may be outlined as follows:

- an **upper zone** (from the intertidal to 18 to 26 m [60 to 85 ft]), including the intertidal and mussel bed, and consisting of *Mytilus* spp., various algae (e.g., filamentous and foliose red algae, several green algal species such as *Ulva*), barnacles, several anemone species (e.g., *Anthopleura elegantissima*, *Metridium senile*), sponges, and ophiuroids;
- a **mid zone** (from 19 to 26 m [65 to 85 ft] to about 76 m [250 ft]), including *Corynactis californica*, ophiuroids, barnacles, *Metridium senile*, *Leucetta/Leucetta losangelensis*, and worm tubes; and
- a **lower zone** (below 76 m [250 ft]), including *Metridium senile*, *M. farcimen*, *Paracyathus stearnsii*, turf, and worm tubes. Platform- or platform group-specific taxa may also be present in the lower zone (e.g., *Desmophyllum dianthus* only at Platform Gail; red encruster only at platforms Harvest, Hidalgo, and Irene).

In summary, the major findings pertinent to invertebrate and algal communities inhabiting six of California's platforms and two natural rock outcrops include the following:

- (1) Results of videotape, quantitative slide, and point contact analyses, in general, produced similar biotic zonation patterns at the platforms studied, although an alternate, three-zone approach to platform characterization may be viable.
- (2) A total of 173 species (or higher taxa) were identified during quantitative slide analysis of 821 photographs from six platforms and two rock outcrops, while a total of 55 species or higher taxa were identified during point count analysis of 883 photographs from six platforms; invertebrate fauna dominated, with only a few algal species/species groups evident (filamentous and foliose red algae; other red and green algae).
- (3) In general, the presence and relative ranking of percent cover dominants from the point count analysis were very consistent with the results of whole slide analysis. Random point count analysis provides a straightforward means of identifying percent cover dominants, whereas quantitative slide analysis (i.e., individual counts or percent cover) provides a more comprehensive characterization of all taxa present, within the limitations of photographic interpretation and identification.

- (4) A total of 130 species or higher taxa (primarily cryptic, interstitial forms typically not visible via photographic techniques) were identified during analysis of scraping samples from the mussel and barnacle zones of Platform Harvest; a total of 90 species or higher taxa were identified from scraping samples from the intertidal, barnacle, and mussel zones of Platform Gail. Findings highlight the complexity and three-dimensional structure of these zones. In total, 181 separate taxonomic entities were noted from scrapings at both platforms, of which 123 (68%) were monospecific taxa. Only 41 taxa occurred at both platforms.
- (5) A mussel zone was present at each platform, although the vertical extent and maximum depth of each mussel zone varied between platforms; considerable variability in mussel density and percent cover was evident.
- (6) Highest species- or taxa-specific density levels were typically encountered in the upper portions of each platform, normally within the upper 30 m (100 ft); within this depth range, the intertidal and mussel zones also contained several other numerically dominant species (e.g., anemones, ophiuroids, barnacles, algae).
- (7) Middle and lower portions of each platform showed considerable variability, but typically contained encrusters (e.g., sponges) and various cnidarian species (e.g., *Metridium*, *Corynactis*); some prominent species at depth were limited in their geographic distribution (e.g., *Desmophyllum dianthus* only at Platform Gail; red encruster only at platforms Harvest, Hidalgo, and Irene). On the deeper water platforms (i.e., Gail and Harvest), deepest zones at the bottom of each platform exhibited a strong affinity to basin fauna.
- (8) Upper portions of the platforms exhibited similar dominant taxa; taxa unique to each platform tended to occur at depth. Overall, comparisons of density- and percent cover-dominants from adjacent platform legs were very similar, although species-specific enumerations were variable.
- (9) Clustering analyses comparing density- and percent cover-dominants at the six platforms identified strong similarities between adjacent platform legs and relatively strong similarity between all platforms, with minor exceptions (i.e., few trends suggesting existence of a north-south gradient in species composition).
- (10) Correspondence analysis of the scraping data revealed that *Mytilus* and barnacle zones were distinct in terms of their respective taxonomic compositions; taxonomic composition of the *Mytilus* zone was more variable than the barnacle zone; and
- (11) Species diversity at the platforms was relatively high, although the number of species present in individual photographs was relatively low and species diversity at natural outcrops was higher (within comparable, shallow depth zones) than that observed at the platforms.

There are few substrates comparable to those afforded by existing platform structures. Naturally-occurring rock substrates that mimic the entire depth range (i.e., continuous substrate) found on platforms do not exist, while intermittent or discontinuous outcrop features exhibiting limited vertical extent are limited (e.g., shallow nearshore outcrops; shelf and slope hard bottom features with vertical relief of 1 to 3 m). Submerged platform surfaces, including platform legs, are optimal settling plates which provide habitat for a variety of attached and motile biota, particularly in the shallower portions of a platform where *Mytilus*, *Metridium senile*, barnacles, and associated fauna and flora predominate. Mid and lower platform zones exhibit decreasing species diversity with depth, yet frequently contain unique taxa which suggest subtle differences in platform community structure affected by platform location.

5.0 List of Preparers

This report was prepared by Continental Shelf Associates, Inc. (CSA), Jupiter, FL and Salinas, CA under Contract No. 1435-01-98-CT-30865 to the MMS Pacific OCS Region, Camarillo, CA.

The following individuals contributed to the technical content of this document:

- Brian J. Balcom (CSA, Salinas, CA) – Degrees: M.S. Biology; B.S. Biological Sciences. 25 years experience.
- Alan D. Hart (CSA, Jupiter, FL) – Degrees: Ph.D. Oceanography; B.S. Zoology. 22 years experience.
- Robert P. Meek (ECOMAR, Inc., Goleta, CA) - Degrees: Ph.D. Zoology; M.S. Zoology; B.S. Biology. 36 years experience.
- Robert B. Cady (CSA, Jupiter, FL) – Degrees: M.S. Oceanography; B.S. Marine Biology. 7 years experience.
- John C. Ljubenkov (Dancing Coyote Ranch Taxonomy, Pauma Valley, CA) - Degrees: M.S. Marine Biology, B.S. Biology. 33 years experience.
- Suzanne V. Benech (Benech Biological and Associates, Ventura, CA) – Degrees: M.S. Biological Sciences (Marine Biology); B.S. Biological Sciences. 29 years experience.

CSA recognizes the expert taxonomic support provided by Sue Benech and John Ljubenkov during analysis of videotapes and 35-mm slide transparencies, with frequent support from Dr. Meek. In addition, an expert group of marine invertebrate and algal specialists identified scraping specimens, including Nancy Carder (echinoderms), Dr. Doug Diener (crustaceans, echinoderms), John Ljubenkov (cnidarians, mollusks, and minor phyla), Larry Lovell (polychaetes), and Dr. Kathy Ann Miller (algae). Special thanks are also offered for Terry Orosco who providing sample sorting, cataloguing, and data entry support.

CSA also wishes to acknowledge the technical support, guidance, and review comments provided over the course of the project by members of the Quality Review Board – Dr. Jack Engle, Dr. Miriam Polne-Fuller, and Dr. James Ray. Their input provided during several early project meetings helped focus the field effort, while their review comments offered on the draft report outlined excellent recommendations to improve the scope of analysis and content of the final report.

In addition, CSA appreciates the support provided by various members of the MMS who provided excellent direction to the project and constructive, critical review of the draft report, including Ms. Mary Elaine Dunaway (Contracting Officer's Technical Representative,

Pacific OCS Region), Mr. Maurice Hill (Pacific OCS Region), Dr. Fred Piltz (Pacific OCS Region), Dr. Ann Bull (Pacific OCS Region), and Dr. Thomas Ahlfeld (MMS Headquarters).

CSA also wishes to note, with deepest regret, the recent passing of Dr. Robert Meek. As Principal Investigator on this project, Dr. Meek was instrumental in sampling design and collection of photographic, videotape, and scraping data at all of the platforms and natural rock outcrops. Dr. Meek personally lead the scientific dive teams and piloted the numerous ROV operations that acquired these data. He was also instrumental in the design and operation of the diver sampling (air lift) system employed during acquisition of the scraping samples from platforms Gail and Harvest. Dr. Meek's knowledge and experience with California subtidal biology, and particularly his understanding of mussel communities on the offshore platforms, was an immeasurable asset to the project.

6.0 Literature Cited

- Blake, J. A., and A. L. Lissner. 1993. Taxonomic atlas of the benthic fauna of the Santa Maria Basin and western Santa Barbara Channel. Final report, Volume 1. Introduction, benthic ecology, oceanography, Platyhelminthes, and Nemertea. Prepared for the U.S. Department of the Interior, Minerals Management Service, Pacific OCS Region, Camarillo, CA. OCS Study MMS 92-0042. 132 pp.
- Bram, J., M. Page, and J. Dugan. 2002. Early development of subtidal invertebrate assemblages on offshore oil platforms in the Santa Barbara Channel. Presentation at MMS Studies Presentations, May 2002, Camarillo, CA.
- Culver, C., B. Mardian, M. Page, and J. Dugan. 2002. Spatial patterns of distribution, abundance and dynamics of invertebrates on offshore oil platforms in the Santa Barbara Channel. Presentation at MMS Studies Presentations, May 2002, Camarillo, CA.
- Dailey, M. D., D. J. Reish, and J. W. Anderson. 1993. Ecology of the Southern California Bight – A Synthesis and Interpretation. University of California Press, Berkeley, CA. 926 pp.
- Dustan, P., J. Leard, O. Meier, M. Brill, and V. Kosmynin. 1999. PointCount'99®. University of Georgia. Website: <http://www.cofc.edu/~coral/corallab.htm>.
- Gosling, M. (ed.). 1992. The mussel *Mytilus*: ecology, physiology, genetics and culture. Elsevier Science, Amsterdam.
- Helmuth, B. S. T. 1998. Intertidal mussel microclimates: predicting the body temperature of a sessile invertebrate. *Ecological Monographs* 68(1):51-74.
- Lessios, H.A. 1996. Methods for quantifying abundance of marine organisms, pp. 149-157. In: Lang and Baldwin (eds.), *Methods and Techniques of Underwater Research: Proceedings of the American Academy of Underwater Sciences 1996 Scientific Diving Symposium*. Washington D.C.
- Love, M. S., M. Nishimoto, D. Schroeder, and J. Caselle. 1999. The ecological role of natural reefs and oil and gas production platforms on rocky reef fishes in Southern California. Final Interim Report. OCS Study MMS 99-0015.
- Love, M. S., D. M. Schroeder, and M. M. Nishimoto. 2003. The ecological role of oil and gas production platforms and natural outcrops on fishes in southern and central California: a synthesis of information. U.S. Department of the Interior, U.S. Geological Survey, Biological Resources Division, Seattle, WA. OCS Study MMS 2003-032.
- MBC Applied Environmental Sciences. 1987. Ecology of oil/gas platforms offshore California. Prepared for the U.S. Department of the Interior, Minerals Management Service, Pacific OCS Region, Camarillo, CA. February 1987. OCS Study MMS 86-0094. 92 pp.

- Miller, K. A. 2004. Nomenclatural and taxonomic changes for California seaweeds. Draft, March 2004. Kathy Ann Miller, University of Southern California, Wrigley Marine Science Center, Santa Catalina Island, CA. 12 pp. Accessed at: <http://wrigley.usc.edu/PDF/CAS seaweedsKAM2004.pdf>.
- Page, H. M., J. E. Dugan, D. S. Dugan, J. B. Richards, and D. M. Hubbard. 1999. Effects of an offshore oil platform on the distribution and abundance of commercially important crab species. *Mar. Eco. Prog. Ser.* 185. 47-57.
- Science Applications International Corporation and Marine Ecological Consultants. 1995. Monitoring assessment of long-term changes in biological communities in the Santa Maria Basin: Phase III, Final Report. Prepared for the U.S. Department of the Interior, Minerals Management Service, Pacific OCS Region, Camarillo, CA and the National Biological Service. OCS Study MMS 95-0049.
- Seed, R. and T. H. Suchanek. 1992. Population and community ecology of *Mytilus*, pp. 87-169. In: E. M. Gosling (ed.). *The mussel Mytilus: ecology, physiology, genetics and culture*. Elsevier Science, Amsterdam.
- Southern California Association of Marine Invertebrate Taxonomists. 2001. A Taxonomic Listing of Soft Bottom Macro- and Megainvertebrates from Infaunal & Epibenthic Monitoring Programs in the Southern California Bight. Edition 4, 6 October 2001. Southern California Association of Marine Invertebrate Taxonomists, San Pedro, CA. 196 pp.
- Steinhauer, M., and E. Imamura (eds.). 1990. California OCS Phase II Monitoring Program: Year Three Annual Report. Prepared for the U.S. Department of the Interior, Minerals Management Service, Pacific OCS Region, Camarillo, CA. OCS Study MMS 90-0055.
- University of California, Santa Barbara (UCSB), Coastal Marine Institute. 2004. Coastal Marine Institute, Program Year 10, Quarterly Report 3 for the Period January 1, 2004 - March 31, 2004. April 9, 2004.
- U. S. Department of the Interior, Minerals Management Service. 2001. Status of leases and qualified companies, Pacific OCS Region (as of November 2001). Contributors: E. William-Flatts, J. Hall, S. Wolfson, and B. Bosserman. Camarillo, CA. 49 pp.
- U. S. Department of the Interior, Minerals Management Service. 2005. Pacific OCS platforms. Minerals Management Service, Pacific OCS Region, Camarillo, CA. Website: <http://www.mms.gov/omm/pacific/offshore/platforms/platformintro.htm>.
- Winn, R. N. 1985. Comparative ecology of three Cancrid crab species (*Cancer anthonyi*, *C. antennarius*, and *C. productus*) in marine subtidal habitats in southern California. Ph.D. dissertation, University of Southern California, Los Angeles.

Appendices

Appendix A
Detailed Operational, Sampling, and Safety Procedures
and Vessel Modifications

Appendix A

Detailed Operational, Sampling, and Safety Procedures and Vessel Modifications

A.1 Operational Procedures

Mooring Systems and the Mooring Process

The preferred mooring plan was to tie to (1) the platform's supply boat mooring buoy (usually set 213 to 305 m [700 to 1,000 ft] from each respective platform), and (2) the platform leg to be sampled via a stern tie. This arrangement allows movement forward and aft with good lateral stability. On occasion, currents and winds only allowed for a stern tie. For deeper water platforms or those without a convenient mooring buoy, a single stern tie was the only alternative. Changing currents and winds can make mooring arrangements tenuous. Use of a bottom-founded anchor was also considered on a site-specific basis for those platforms in <137 m (<450 ft) of water.

The mooring systems and plan outlined above work well in good weather conditions in cases where there are nearby mooring buoys. In marginal weather and/or situations without available mooring buoys, the contingency mooring arrangement used during the Preliminary Survey (i.e., stern tie where winds and currents allow, with operations on the nearest leg[s]) were employed. This arrangement has inherent risks (with changing currents and winds) of disruptions in the day's sampling efforts. In waters 91 to 107 m (300 to 350 ft) or less in depth, a bow anchor could have been deployed to stabilize the vessel. A sea anchor could also have been used.

Platform Leg Selection

In all cases, the mooring location was the primary determining factor as to which legs were to be sampled. Deviations in site-specific conditions warranted adjustment to these preferred designations; recommendations for such adjustments were made in the field, on site, by the Principal Investigator and Project Manager, in consultation (either in person or via telephone) with the Minerals Management Service (MMS) Contracting Officer's Technical Representative (COTR). The relative positions of available moorings to each platform were reviewed and proximal legs designated below. Under optimal conditions (i.e., where available moorings and ambient oceanographic conditions allowed), the following legs were to be sampled:

<u>Primary Platform</u>	<u>Legs to be Sampled</u>
Grace	C3, C4
Gail	B1, B2
Hidalgo	B4, B5
Harvest	B4, B5

<u>Secondary Platform</u>	<u>Leg to be Sampled</u>
Habitat	A1
Hermosa	B5
Hondo	inshore, downcurrent
Irene	A1

Diver Mobilization

Diver mobilization included the proper emplacement of hoses, dive helmets and associated gear, and topside equipment (including communications).

Diving Equipment Suite

Diving equipment included a KMB 17A dive hat for the scientific diver with surface supplied air. This system provides communication to the tender and deck personnel. A hooka system was provided for the scientist diver's assistant. Both systems were supplied by a single 40 cfm/300 psi diesel-powered compressor attached to a 60-gallon volume tank and air filtration system. Each diver system (i.e., hat, bailout, and hoses) was backed up with a redundant system.

A.2 Sampling Procedures

Diver Video

The diver video system included a hand-held High 8 color camera and housing with a wide-angle lens. The system was pre-set at a focal length of 0.6 to 0.9 m (2 to 3 ft) and moved slowly (i.e., at a rate of 1.8 to 2.4 m [6 to 8 ft] per minute). Two 250-watt underwater lights were used to color fill the frame, aiding in video detail and proper color rendition (i.e., an aid to post-survey video interpretation and biological identification).

During some dives, annotation of the videotapes was augmented by placing a dive computer in the field of view that displayed depth and dive duration. This information, along with the audio log, facilitates analyses of diver videos. Although cumbersome, time consuming, and somewhat duplicative, the diver video was considered to be essential in depths above 9 to 12 m (30 to 40 ft) where the remotely operated vehicle (ROV) was more prone to wave surge instability. Divers anticipated and compensated for some of the surge and current and acquired better quality video for biological analyses in these upper depth regions.

Diver Photography

Photographic data (photoquadrats) were collected via diver (hand-held) 35-mm color camera and a 0.0625 m² photoquadrat frame (i.e., image area). Optimal results were achieved through the use of a Nikonos V camera equipped with a 28-mm Nikon lens and a dual strobe configuration. All photos and settings were logged verbally by the diver and recorded by the tender and quality assurance/quality control (QA/QC) personnel. The best aperture settings were determined to be f22 and f16, however f8 could have been used in those zones with exceptionally dark backgrounds. Proper focal distance for each photoquadrat was assured

using a mounted framer. Resultant photoquadrat size was 0.0625 m²; photoquadrats and scrapings have identical dimensions (i.e., 1/16 m² or about 10 inches per side). A total of 10 to 15 photographs was taken per zone; photo location was predetermined using the randomization protocol (**Appendix B**). Zones sampled conformed to the zonation patterns defined by Sue Benech during Quality Review Board (QRB) Meeting #1 (i.e., summary of results of Task 1, Videotape Analysis).

Diver Sampling (Air Lift) System

The diver sampling system consisted of a 4-inch (diameter) air lift system with 30 m (100 ft) of hose attached to the vessel's A-frame down weight. This 100-ft air lift system was also connected to a 100-ft diver sampling hose (4-inch diameter) that terminated on deck in a 15-gallon aluminum "accumulator" drum (i.e., to allow slow deceleration of the sample). The sampling hose enters the accumulator horizontally near the top of the drum; an opening at the bottom of the drum allows water and entrained biota to exit. The drum was positioned over a sieve box (i.e., two nested screens) outfitted with removable Nytex mesh screening to capture scraped material as it exits the bottom of the drum. Use of a smaller diameter or more flexible hose was considered due to space and handling concerns.

Divers employed a 0.0625 m² quadrat (i.e., 25 cm x 25 cm) and a small pneumatic hammer and chisel to measure and dislodge the biological material within the quadrat frame. Scraped material was suctioned off the quadrat and conveyed to the surface via the lift system. The depth of the down weight and lift system were adjusted as needed, depending on diver depth and position.

The lift system was activated prior to any scraping activity to assure that cryptic and motile interstitial fauna are collected. The lift system continued to operate for 20 to 30 seconds after scraping was completed to clear all specimens from the lift line (i.e., to assure that scraped specimens reached the surface).

Lifted specimens flowed into an open conduit system designed to reduce stream velocity, minimizing damage to soft-bodied biota. Specimens were retained on Nitex mesh screening (1.0- and 0.5-mm sieve), relaxed, and fixed in buffered formalin. Observations of sample content were made prior to fixation. When practical, large algal specimens were processed separately to facilitate pressing. A total of eight scrapings was collected per zone per platform leg (with the exception of the mussel zone on a single leg on Platform Gail); biotic zones sampled, in order of importance, included (1) the mussel zone, (2) the intertidal zone, and (3) the barnacle/scallop zone, with lower zones being of lower priority. The location of each scraping was determined randomly (see *Diver Photography* and *ROV Photographic Data Collection*).

Field preparation of algal and invertebrate samples was via buffered formalin preservation (i.e., no freezing; 4 percent formalin solution for algae; 10 percent formalin solution for invertebrates). Some pressing was required for larger algal specimens. Invertebrates were relaxed prior to preservation using either magnesium sulfate or magnesium chloride. All sample containers were labeled with a unique station number and date (i.e., platform and leg designation, sample depth); internal labels containing the same station and date information

were also used. All samples (photographs, videotapes, vouchers) were properly logged upon collection. Sample collection and sample tracking forms were maintained by the QA/QC officer. Scrapings were only collected from Platforms Gail and Harvest.

ROV Photographic Data Collection

Photographs collected by the ROV were consistent with those collected by divers. Proper focal distance was assured through the use of an ROV-mounted laser sighting system maintained within the field of view of the videocamera. The ROV was handled using either the vessel's davit (with side winch) or A-frame (with stern winch). Similarly, the sample air lift system and down weights were also handled using this arrangement.

The ROV was equipped with a Photosea PS 1000A 35-mm camera and 1500S strobe system for still photography. The Photosea camera was fitted with a 28-mm lens. Based on results from the Preliminary Survey, focal distance was preset at 16 inches (i.e., lens to subject distance) and lens aperture was set at f 22. The camera was bulk loaded with color slide film rated at 200 ASA. Use of the laser sighting system ensured precise and repeatable photographic distance (i.e., 16 inches with a 28-mm lens), and also provided a basis for estimating the relative size of biota within the image.

Randomization of photographs was implemented. This was accomplished by referencing the zonation patterns determined during inspection videotape analysis for each platform, eliminating 0.6 m (2 ft) at the edges of each zone (i.e., transition zone), and implementing a randomization protocol for each biotic zone. A detailed discussion of the randomization process is provided in **Appendix B**.

ROV Marine Growth Depth Probe

A small, air-operated chipping hammer was fitted with a specially designed probe (i.e., 1/4 inch by 1/4 inch tool steel, 8-inch long sharpened tip) designed to penetrate hard growth as a means of determining growth thickness. The probe, marked at 1-inch intervals, was placed within the image area of the ROV videocamera. The ROV operator brought the probe into contact with the growth and thrust forward while the hammer was powering up. The chisel was driven through existing platform growth to establish growth thickness.

The marine growth depth probe (and other air-operated systems) was usable to approximately the 137-m (450-ft) depth. A 200-m (650-ft), 3/8-inch (ID) hose was used to supply air to the system from the surface compressor. The resistance to airflow creates lag time between start up and shut down of the system. The lag in start up can create difficulties holding the ROV in position while awaiting start up; after shut down, air continues to flow from the system for some time until the pressures at depth and within the supply hose equalize. Consideration was given to installation of an electronically activated solenoid at the tool or moving the supply of air nearer the tool by providing a high pressure source solenoid operated at or near the down weight. The probe also needed to be moved to one side of the video field since exhaust air significantly obscured the video image.

ROV Video Data Collection

The ROV video system was operated at vertical speeds of 1.8 to 2.4 m (6 to 8 ft) per minute (i.e., appropriate for general biological characterization) at distances of 0.6 to 0.9 m (2 to 3 ft). Zoom capabilities were employed, as needed, to investigate community components of interest.

ROV Sonar System

The ROV was outfitted with a Kongberg Simrad MS 900 imaging sonar. The sonar was used to navigate between platform legs and to avoid major debris. The sonar has not proven to be a useful tool to scan and characterize the size (i.e., areal extent) of the mussel pile beneath each platform.

ROV and Diver Recording and Annotation

Dual recording systems were used to provide two original S-VHS tapes for each ROV excursion. The second recorder in the series was hooked to a TV monitor where recorded video quality was continuously monitored. Diver video was copied from High 8 to S-VHS; the S-VHS copy was utilized during biological interpretation. Photographs were taken in slide format (i.e., E6); test strips were developed on board or at the end of each field day to ensure proper photograph collection (i.e., proper focal distance and aperture setting). All photographs were logged and annotated by both the tender and QA/QC personnel.

The ROV video and Photosea still camera were annotated directly with alphanumeric identifiers. A similar system does not exist for the diver video and still photographs. Depth and time readings can be periodically flashed in front of the diver video, but a similar system for the diver photographs has not been attempted.

A.3 Safety and Emergency Procedures

Safety and emergency procedures were to be implemented in the event of two major accidents, including (1) dive-related accidents, and (2) an accidental H₂S release from the platform.

In the event of a dive-related accident, ECOMAR staff were responsible for

- Immediately notifying the platform; and
- Making immediate arrangements for medical evacuation.

In the event of an accident, injured personnel were to be offloaded to the platform for helicopter evacuation.

In the event of an accidental H₂S release, gas monitors aboard the platform will sound an alarm. The *Dawn* was also equipped with an H₂S monitor/alarm. Major response activities to an accidental H₂S release include

- Vessel personnel to take immediate shelter in the *Dawn*'s cabin, and doors are to be shut and sealed;
- Emergency breathing apparatus will be issued; and
- The *Dawn* will be moved upwind and off-site.

Depending on the nature of the sampling activities being conducted at the time and the relative position of the vessel to the platform, several vessel responses are possible. When the *Dawn* is moored upwind of the platform and an H₂S alarm sounds, downwind mooring lines will be cut immediately and the vessel will motor upwind, or the anchor mooring line will be winched in should divers be in the water. Divers in the water at the time will be notified to remain at depth until ordered to surface (i.e., once the vessel has reached a safe distance upwind of the platform). When the *Dawn* is located lateral to or downwind of the platform, mooring lines will be cut and the vessel will either drift or motor away from the platform; diver safety will be a prime determining factor in a decision to motor. In all cases, topside personnel will take shelter in the cabin with the doors sealed.

A.4 Vessel and Equipment Modifications and Sampling Efficiency

In response to MMS comments and concerns (i.e., safety, space limitations) expressed following the Preliminary Survey, ECOMAR completed several vessel and equipment modifications, including the following:

- Relocation of the dive compressor to below deck astern; advantages: clears additional deck space aft, eliminates a significant source of noise and exhaust fumes topside;
- Relocation of the videotape and ROV control equipment from the main cabin to the bridge; advantages: consolidates ROV control operations on the bridge, clears needed space in the main cabin area;
- Installation of an H₂S monitor/sensor; advantages: supplements platform-based monitors, provides secondary alarm system to vessel crew;
- Addition of safety and emergency procedures to the Sampling Plan; advantages: informs cruise participants of appropriate safety procedures;
- Addition of emergency breathing apparatus; advantages: provides emergency air supply to the crew in the event of an H₂S release aboard the platform;
- Installation of fixed arms on the A-frame; advantages: provides a fixed point of deployment for the ROV and surface air systems;
- Development of a closed "accumulator" system for the lift system samples; advantages: provides a closed system for receipt and retrieval of lift samples topside; and
- Purchase of a more flexible lift hose; advantages: allows for additional deck space, as lift hose storage requirements are reduced.

Appendix B
Randomization of Photoquadrats

Appendix B

Randomization of Photoquadrats

Existing biotic zones and their depth of occurrence were determined for each of the six platforms based on the results of inspection videotape review, as summarized in **Table B-1**. Subsequent random selection of photograph location within each biotic zone was then established, taking into consideration the extent of each zone. *Note: Randomization of photographs could not be implemented for the intertidal zone, given the limited extent of this zone and the relative size of the photoquadrats (~10 inches/side). As many as 15 photographs were collected in the intertidal wherever conditions would allow (i.e., across the face of the platform leg, regardless of water depth).*

For the remaining zones (e.g., *Mytilus*, barnacle/scallop, etc.), whether photographed via diver or remotely operated vehicle (ROV), a 0.6-m (2-ft) buffer was established, encompassing the area in which a faunal transition between adjacent zones may occur. Buffers were established in both upper and lower reaches of each zone. Due to restrictions on diving operations, the maximum extent of the deepest diver sampled zone (e.g., barnacle/scallop zone on Grace) was truncated at 24.4 m (80 ft) subsurface. *Note: The lower portions of such zones, beyond diver depths, were normally photographed using the ROV.* For example, at Platform Grace, four major biotic zones were noted (in addition to the intertidal zone):

<u>Zone</u>	<u>Extent of Zone (ft subsurface)</u>	<u>Adjusted Zone (ft subsurface)</u>
<i>Mytilus</i>	6 to 45	8 to 43
Barnacle/Scallop	45 to 90	47 to 88
Anemone/Encruster	90 to 230	92 to 228
Encruster/Sea Star	230 to 318	232 to 316

The extent of each zone was then determined (e.g., Grace *Mytilus* zone = 35 ft) concurrently with the starting depth for each zone (i.e., at 8 ft subsurface for the *Mytilus* zone at Platform Grace):

<u>Zone</u>	<u>Adjusted Zone (ft subsurface)</u>	<u>Extent (ft)</u>	<u>Start Depth (ft subsurface)</u>
<i>Mytilus</i>	8 to 43	35	8
Barnacle/Scallop	47 to 88	41	47
Anemone/Encruster	92 to 228	136	92
Encruster/Sea Star	232 to 316	84	232

A random number table (Rand Corporation, Table A-1) was used (i.e., blind selection of a number within the table, numbers read across) to select a total of 25 numbers for each zone (to allow for potential duplicates), creating a unique random number set for each zone. Random numbers ranged from 00 through 99.

Selected numbers were then converted to a percentage (e.g., 45 became 45% or 0.45). The number representing the extent of each zone was subsequently multiplied by its unique random number set, with products rounded, as appropriate; the absolute value of the start depth was subsequently added. All final positive values were converted to negative to represent depth subsurface. For example, in the Grace *Mytilus* zone, the following was calculated, where 35 ft is the extent of the *Mytilus* zone and 8 ft subsurface was the start depth:

Table B-1. Characteristics of platform biotic zones as determined during inspection videotape analysis.

Biotic Zone ¹	Zone Depth (m [ft] subsurface)	Vertical Extent (m [ft])
Primary Platforms -		
Platform Gail		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 12.1 (6 to 40)	10.3 (34)
Barnacle/Scallop	12.1 to 48.8 (40 to 160)	36.7 (120)
<i>Corynactis</i> /Encruster	48.8 to 115.8 (160 to 380)	67.0 (220)
Vase sponge/Encruster	115.8 to 192.0 (380 to 630)	76.2 (250)
Encruster/Sea Star/Cup Coral	192.0 to 225.2 (630 to 739)	33.2 (109)
Platform Grace		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 13.7 (6 to 45)	11.9 (39)
Barnacle/Scallop	13.7 to 27.4 (45 to 90)	13.7 (45)
Anemone/Encruster	27.4 to 70.1 (90 to 230)	42.6 (140)
Encruster/Sea Star	70.1 to 96.9 (230 to 318)	26.8 (88)
Platform Harvest		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 25.9 (6 to 85)	24.1 (79)
Barnacle/ <i>Corynactis</i>	25.9 to 50.3 (85 to 165)	24.4 (80)
Anemone/Encruster	50.3 to 105.2 (165 to 345)	54.9 (180)
Vase Sponge/Encruster	105.2 to 169.2 (345 to 555)	64.0 (210)
<i>Metridium</i> /Sea Star	169.2 to 205.7 (555 to 675)	36.6 (120)
Platform Hidalgo		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 19.8 (6 to 65)	18.0 (59)
Barnacle	19.8 to 32.0 (65 to 105)	12.1 (40)
<i>Metridium</i> /Encruster	32.0 to 109.7 (105 to 360)	77.7 (255)
Sponges/Encruster	109.7 to 132.3 (360 to 434)	22.5 (74)
Secondary Platforms -		
Platform Habitat		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
<i>Mytilus</i>	1.8 to 18.3 (6 to 60)	16.5 (54)
<i>Corynactis</i>	18.3 to 54.9 (60 to 180)	36.6 (120)
<i>Metridium</i> /Encruster	54.9 to 88.4 (180 to 290)	33.5 (110)
Platform Irene		
Intertidal	0 to 1.8 (0 to 6)	1.8 (6)
Barnacle/Algae ²	1.8 to 10.7 (6 to 35)	8.8 (29)
<i>Mytilus</i>	10.7 to 25.9 (35 to 85)	15.2 (50)
<i>Corynactis</i> /Encruster	25.9 to 73.4 (85 to 242)	47.9 (157)

¹ Zonation patterns based on the results of inspection videotape review; zones verified via ROV observations.

² The barnacle/algae zone of Platform Irene represents an area recently cleaned.

First random number	31
Percentage conversion	0.31
Calculations	$(0.31 \times 35) = 10.85 \approx 11$
	$11 + \left -8 \right = 19 \text{ ft}$
Photograph location:	19 ft subsurface

Results of the photoquadrat randomization produced a listing of 15 photograph locations per biotic zone for each of the primary and secondary platforms. For primary platforms, where two legs were to be sampled, separate photoquadrat lists were generated for each leg using the random number assignment and calculation process described previously.

Appendix C
Data Appendix: Whole Slide Analysis

Appendix C has been organized into three primary sections:

- Table C-1 – this two-page table summarizes the taxa, undifferentiated assemblages and physical characteristics identified during quantitative slide analysis.
- Table C-2 – this two-page table summarizes the density and percent cover estimates of select dominant species or taxa which resulted from tabularization and analysis of the observations from each photoquadrat. Data are organized by platform.
- Whole Slide Analysis Data Set – separate spreadsheets (each containing four to seven pages) have been developed for the 10 platform legs and Diablo and Nifty Rocks. For each platform leg or outcrop, separate spreadsheets are provided for density (i.e., number of individuals/0.0625 m², labeled as “counts”) and percent cover (i.e., coverage/0.0625 m² – labeled as “%”). Site identifiers are located in the upper left corner of each spreadsheet (e.g., Platform Gail – Leg A1 counts). Within each spreadsheet, data are organized by water depth (i.e., from shallowest to deepest) in the horizontal plane. In the vertical plane, data are organized by dominant taxa (i.e., highest total number of individuals for density tables; highest average percent cover for percent cover tables), in descending order. Summary data (i.e., total, average, minimum, maximum, and frequency of occurrence) are provided on the last page of each separate set of spreadsheets.

Table C-1. Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks. Dominant species or taxa, as determined via ranking of the top 12 taxa by density or percent cover, noted in bold type; dominant species shown separately for platforms (P), rock outcrops (R), or both (P+R).

<p>FLORA: Algae: Alga, brown, blade Alga, brown, clump Alga, coralline, encrusting Alga, encrusting (<i>Lithothamnion</i>) (R) Alga, green clump Alga, green clump (<i>Codium</i>-like) (R) Alga, green encrusting (P) Alga, green filamentous Algae, red filamentous (P+R) Algae, red foliose (P) <i>Bossiella</i> spp. (R) <i>Codium</i> spp. <i>Corallina</i> spp. (P) <i>Egregia</i> spp. <i>Rhodymenia ?lobata</i> <i>Rhodymenia</i> spp. <i>Ulva lactuca</i> (P)</p> <p><i>Note: Algae broadly characterized due to limitations of photographic resolution and interpretation.</i></p> <p>FAUNA: Crustaceans: Barnacles (Cirripedia): <i>Balanus nubilus</i> (P) <i>Balanus</i> spp. (P+R) Barnacle, unidentified <i>Chthalamus</i> spp. (R) <i>Pollicipes polymerus</i> (P) <i>Tetraclita squamosa</i> (P)</p> <p>Decapod crabs (Decapoda): <i>Cancer antennarius</i> <i>Cancer</i> spp. <i>Hemigrapsus nudus</i></p> <p>Galatheid crabs (Galatheidae): <i>Galathea californiensis</i></p>	<p>Echinoderms: Sea stars (Asteroidea): <i>Asterina miniata</i> (=Patiria) <i>Dermasterias imbricate</i> <i>Henricia leviuscula</i> <i>Henricia sanguinolenta</i> <i>Orthasterias koehleri</i> <i>Pisaster brevispinus</i> <i>Pisaster giganteus</i> <i>Pisaster ochraceus</i> (P) <i>Poraniopsis inflata</i> <i>Pycnopodia helianthoides</i> <i>Stylasterias forreri</i></p> <p>Urchins (Echinoidea): <i>Allocentrotus fragilis</i> <i>Lytechinus pictus</i> <i>Strongylocentrotus franciscanus</i> <i>Strongylocentrotus purpuratus</i> (R)</p> <p>Brittle stars (Ophiuroidea): <i>Amphipholis</i> spp. (P) <i>Ophiocantha diplasia</i> <i>Ophiothrix spiculata</i> (P+R) Ophiuroid, unidentified (P)</p> <p>Holothuroids (Holothuroidea): <i>Dendrochirotida</i>, unidentified (R) <i>Parastichopus californicus</i></p> <p>Crinoids (Crinoidea): <i>Florometra serratissima</i></p> <p>Mollusks: Bivalves (Pelecypoda): Anomiidae, unidentified Bivalve, nestling, unidentified <i>Chama arcana</i> <i>Crassadoma gigantea</i> Mytilidae, unidentified <i>Mytilus californianus</i> (P+R) <i>Mytilus</i> spp. (P)</p>	<p>Gastropods (Gastropoda): Aeolid (SF Aeolidiidae), unidentified <i>Aeolidia papillosa?</i> Aeolidioidea, unidentified <i>Anisodoris nobilis</i> <i>Archidoris montereyensis</i> <i>Calliostoma</i> spp. <i>Cypraea spadicea</i> <i>Dialula sandiegensis</i> Dorid, white, unidentified Dorid, yellow, unidentified (?<i>Doriopsilla</i>) Doridacea, unidentified <i>Flabellina iodinea</i> Gastropoda, unidentified <i>Hermisenda crassicornis</i> <i>Pleurobranchaea californica</i> <i>Serpulorbis</i> spp. <i>Triopha catalinae</i> (P)</p> <p>Chitons (Polyplacophora): Chiton, unidentified</p> <p>Polychaetes: <i>Eudistylia polymorpha</i> (P) Sabellidae/Serpulidae, unidentified (feather duster worm) <i>Protula superba</i> (P) <i>Salmacina</i> spp. Serpulidae, unidentified Spionidae, unidentified <i>Spirobranchus</i> spp. Tube worm, double spiral Tube worm, single fan Worm tubes, calcareous (P) Worm tubes, plain (P)</p>
--	--	---

Table C-1. Taxa identified during the photographic analysis of six California platforms and Diablo and Nifty Rocks. Dominant species or taxa, as determined via ranking of the top 12 taxa by density or percent cover, noted in bold type; dominant species shown separately for platforms (P), rock outcrops (R), or both (P+R) (continued).

<p>Cnidarians: Anthozoans (Actiniaria): Actiniaria, brown Actiniaria, pink <i>Amphianthus californicus</i> Anemone, pink Anemone, unidentified <i>Anthopleura elegantissima</i> (rosy morph) (P+R) <i>Anthopleura</i> spp. <i>Anthopleura</i> spp. (whitish, no rose) (P) <i>Anthopleura xanthogrammica</i> (R) Anthozoa, unidentified <i>Astrangia</i> spp. <i>Balanophyllia elegans</i> (R) <i>Coenocyathus bowersi</i> (P) <i>Corynactis californica</i> (P+R) Cup coral, white, unidentified <i>Desmophyllum dianthus</i> (P) <i>Epiactis prolifera?</i> Gorgonian, unidentified <i>Metridium exilis</i> (P) <i>Metridium farcimen</i> (P) <i>Metridium senile</i> (P+R) <i>Metridium</i> spp. (P) <i>Metridium</i> spp., dark or Feather Duster <i>Palythoa</i> (tan zoanthid) (P) <i>Palythoa</i> (tan) <i>Paracyathus stearnsii</i> (P) <i>Urticina</i> spp. Zoanthid (<i>Palythoa</i>) (P) Zoanthid, colonial tan (P) Zoanthid, solitary tan</p>	<p>Hydrozoans: Hydrozoa, colony Hydrozoa, tan clump <i>Plumularia</i> spp. (P) <i>Eudendrium</i> spp.? Hydroid, pink Hydroid, tan (P) Hydroid, tan branching (P) Hydroid, white</p> <p>Minor Phyla: Sponges (Porifera): <i>Cliona</i> spp., yellow <i>Halichondria panicea</i> (P) <i>Leucetta losangelensis</i> (P) <i>Leucilla nuttingi</i> <i>Leucetta</i> spp. (P) Sponge, gray encrusting (P) Sponge, green encrusting (P) Sponge, orange encrusting (P) Sponge, orange round Sponge, purple encrusting Sponge, tan cup (P) Sponge, tan encrusting (P) Sponge, tan foliose encrusting Sponge, tan globose Sponge, unidentified (R) Sponge, white encrusting (P) Sponge, white finger Sponge, yellow encrusting (P) <i>Staurocalyptus</i> spp. (P)</p> <p>Bryozoans (Bryozoa): Bryozoa, staghorn, yellow (R) Bryozoa, tan branching (P) Bryozoa, white branching <i>Bugula</i> spp. <i>Crisia/Filicrisia</i> spp. <i>Hippodiplosia</i> spp.</p>	<p>Tunicates (Urochordata, Ascidiacea): <i>Amaroucium</i> spp. <i>Aplidium</i> spp. <i>Botrylloides</i> spp. <i>Halocynthia igaboja</i> <i>Styela</i> spp. Tunicate, encrusting tan (P) Tunicate, encrusting translucent (P) Tunicate, globular, unidentified Tunicate, solitary, unidentified Urochordata, unidentified</p> <p>Fishes (Osteichthyes): <i>Oxylebius pictus</i> <i>Sebastes</i> spp.</p> <p>Undifferentiated Assemblages and Encrusters: Algae/hydrozoa mix Bryozoa turf (P) Encruster, blue (P) Encruster, gray Encruster, green Encruster, lavender (P) Encruster, orange Encruster, pink Encruster, red (P) Encruster, tan (P) Encruster, white Encruster, yellow (P) Turf (P+R)</p> <p>Physical Characteristics: Bare metal (P) Line (P)</p> <p>Total: 173 taxa, including undifferentiated assemblages and encrusters, plus physical characteristics</p>
---	---	--

Table C-2. Summary comparison of average density and/or percent cover estimates for select dominant taxa by platform. Maxima noted via shading.

Species or Taxon		Gail	Grace	Harvest	Hidalgo	Habitat	Irene
<i>Metridium senile</i>	#	38.8-60.4	10.8-43.1	29.5-38.6	78.9-135.3	22.8	330.9
	↓↑	1-213	1-165	1-90	1-275	1-60	15-510
	%	31.8-41.7	3.7-36.6	29.5-38.5	34.9-46.7	11.5	66.0
	↓↑	1-95	0.5-80	1-90	0.5-98	0.5-30	3-90
<i>Mytilus</i> spp./ <i>Mytilus californianus</i>	#	24.3-35.5	76.0-79.8	36.7-40.9	85.0-117.8	32.6	42.5
	↓↑	2-160	4-240	1-110	5-220	3-80	4-124
	%	19.2-60.4	49.1-52.6	21.0-35.0	54.2-57.1	40.6	29.5
	↓↑	5-90	5-85	5-90	3-85	4-100	2-85
<i>Balanus</i> spp./ <i>B. nubilus</i> / <i>Tetraclita squamosa</i>	#	9.1-9.5	24.9-27.3	4.2-5.9	2.5-5.4	12.7	10.0-42.0
	↓↑	1-30	1-100	1-27	1-25	1-64	7-200
Worm tubes, plain and calcareous	#	5.6-11.3	1.0-4.7	2.8-3.5	2.6-2.9	1.0	51.5
	↓↑	1-27	1-10	1-12	1-8	1	3-100
Sponge, yellow encrusting	%	1.2-3.5	3.5-11.3	5.3-16.1	0.5-3.0	0.6	0.1-15
	↓↑	0.5-20	0.5-30	1-70	0.5-3	0.5-1	0.1-15
Sponge, tan encrusting	%	4.0-10.5	6.6-9.8	7.5-30.0	7.8-10.0	7.9	32.4
	↓↑	0.5-50	1-50	5-30	0.5-20	1-40	1-60
Turf	%	6.0-8.4	25.6-37.4	19.3-21.3	18.2-30.1	10.5	10.2
	↓↑	0.4-30	1-97	0.5-75	0.5-80	0.5-95	1-25
Bare Metal	%	33.3-49.2	7.5-8.4	7.8-11.5	18.5-39.0	1.0	NP
	↓↑	2-85	2-15	0.5-50	0.5-65	1	NP
<i>Corynactis californica</i>	#	159.7-448.9	211.9-344.2	35.8-168.0	27.8	448.5	10.1
	↓↑	1-693	1-500	4-360	9-75	12-700	1-33
	%	22.8-64.0	42.6-69.2	11.0-42.0	9.0	73.5	ND
	↓↑	0.5-98	0.5-100	1-90	2-25	1-100	ND
<i>Anthopleura elegantissima</i> (rosy morph)	#	20.3	13.6-25.9	7.8-9.4	84.9	19.6	10.8
	↓↑	1-100	1-62	1-24	2-185	1-75	1-25
	%	26.4	8.7-30.8	6.3-8.9	43.5	23.0	3.9
	↓↑	0.5-100	0.5-90	1-20	1-95	1-95	0.5-10

Table C-2. Summary comparison of average density and/or percent cover estimates for select dominant taxa by platform. Maxima noted via shading (continued).

Species or Taxon		Gail	Grace	Harvest	Hidalgo	Habitat	Irene
<i>Ophiothrix spiculata</i> /Ophiuroid, unidentified	#	15.8-24.2	26.7-46.9	23.0-44.7	57.7-78.4	14.4	4.0
	↓↑	1-66	1-180	1-180	1-430	1-73	2-7
<i>Metridium farcimen</i>	#	11.4	1.0-6.5	4.4	24.3-27.5	NP	12.0
	↓↑	1-88	1-18	3-8	19-42	NP	12
	%	ND	ND	37.0	17.5-21.7	NP	ND
	↓↑	ND	ND	15-100	10-35	NP	ND
Filamentous red algae	#	11.1-27.9	1.0	21.4	NP	1.0	1.0
	↓↑	1-70	1	2-40	NP	1	1
	%	ND	16.7-21.2	ND	NP	22.6	ND
	↓↑	ND	0.5-50	ND	NP	1-50	ND
Foliose red algae	%	1.7	1.2-3.0	5.6-12.2	1.4-2.2	NP	NP
	↓↑	1-2	0.5-5	0.5-30	0.5-10	NP	NP
<i>Leucetta/Leucetta losangelensis</i>	#	1.0	1.0	13.1-50.8	1.0	NP	NP
	↓↑	1	1	1-80	1	NP	NP
	%	10.0	6.2	14.8-48.8	25.3-30.5	NP	NP
	↓↑	10	1-20	1-80	2-80	NP	NP
<i>Paracyathus stearnsii</i>	#	4.0-9.0	26.8-71.9	1.0	NP	20.7	NP
	↓↑	1-12	1-201	1	NP	1-53	NP
Red encruster	%	NP	NP	35.4-49.6	22.4	NP	1.0
	↓↑	NP	NP	2-90	5-70	NP	1
<i>Metridium exilis</i>	#	146.9-340.0	32.3	NP	NP	NP	NP
	↓↑	2-580	15-60	NP	NP	NP	NP
	%	23.0-62.0	ND	NP	NP	NP	NP
	↓↑	1-95	ND	NP	NP	NP	NP
Yellow encruster	%	0.5-0.75	0.8-1.8	13.1-16.0	12.1-30.0	0.5	NP
	↓↑	0.5-1	0.5-3	0.5-70	0.5-50	0.5	NP

Notes: # - average number of individuals (density)/0.0625 m²; % - average percent cover/0.0625 m²; density and percent cover values provided as a range, reflecting averages representative of each leg. Solitary densities or percent cover estimates are for taxa from the secondary platforms or for dominant species/taxa which only occurred on one leg of a primary platform; ↓↑ - minimum and maximum values (i.e., density or percent cover); ND - present but not determined; NP - not present.

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	022gaD	023gaD	029gaD	030gaD	021gaD	026gaD	027gaD	028gaD	024gaD	025gaD	031gaD	032gaD	019gaD	020gaD	017gaD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	4	4.1	5	5.1	6	6.1	6.2	6.3	7	7.1	7.2	7.3	9	9.1	12
Corynactis californica, individuals															
Metridium exilis	30	220	30	250	375	200	65	200	130	165	30	150	130	200	440
Metridium senile	4	8	3	2		42	26		2	22	7	4	1	1	
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc		45	20	40	20	30	20	40	25	20	60	70	30	30	
Ophiothrix spiculata															
Mytilus	160	36	36	14	12	30	3	27	44	26	40	20	25	24	
Desmophyllum															
Anthopleura elegantissima (rosy morph)	8	1					37			3	8	1	1	2	11
Balanus sp	16	3	20	4	9	3		8	15	3	12	9	30	10	1
Ophiuroid unid															
Metridium farcimen															
Worm tubes, plain															
Galathea californiensis															
Bare Metal															
Turf															
Balanus nubilus (?)															
Sponge, tan encrusting															1
Codium						3	3								5
Worm tubes, calcareous															
Paracyathus stearnsi															
Sponge, yellow encrusting															
Crassadoma gigantea															
Hydroid, tan branching		1		1	1						1	1		1	
Sponge, orange encrusting															1
Sponge, green encrusting															
Sponge, white encrusting															
Coenocyathus bowersi (colonies)															
Sponge, purple encrusting															
Encruster - orange															
Encruster - white															
Urochordata Cystodytes, Aplidium, Styela															
Cancer antennarius															
Chama arcana															
Encruster - yellow															
Florometra serratissima															
Hydroid, pink															
Oxylebius pictus															
Spirobranchus															
Zoanthid, colonial tan															
Aeolidioidea															
Amphianthus californica															
Bryozoa, white branching (colonies)															
Dermasterias imbricata															
Doridacea															
encrusting coralline															
Eudistylia polymorpha															
Hemigrapsus nudus			1												
Orthasterias koehleri															
Sebastes sp															
Sponge, cup tan															
Tunicate, encrusting tan															

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	016gaD	015gaD	014gaD	013gaD	011gaD	010gaD	009gaD	008gaD	006gaD	088ga1336	005gaD	004gaD	087ga1335	085ga1334	082ga1332
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	14	16	18	21	24	28	30	31	34	36	36.1	38	39	42	45
Corynactis californica, individuals									20				350		
Metridium exilis					12		260	11	130	100	390	570	48	23	30
Metridium senile	20	70	40	64	60			3	21	33		18	5	43	54
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc	30		10	50			50	5	15	50	10	5	10	50	
Ophiothrix spiculata				30				5	11		4	2			
Mytilus															
Desmophyllum															
Anthopleura elegantissima (rosy morph)	26	100	40			44		22	1						
Balanus sp		1							1						
Ophiroid unid										3				18	1
Metridium farcimen															
Worm tubes, plain															
Galathea californiensis															
Bare Metal															
Turf													1		
Balanus nubilus (?)															
Sponge, tan encrusting					1		1	1	1		1	1		1	
Codium	2		5	10											
Worm tubes, calcareous															
Paracyathus stearnsi															
Sponge, yellow encrusting					1				1						1
Crassadoma gigantea					1										
Hydroid, tan branching															
Sponge, orange encrusting				1	1		1				1		1		
Sponge, green encrusting							1				1	1			1
Sponge, white encrusting											1	1			
Coenocyathus bowersi (colonies)															
Sponge, purple encrusting											1				
Encruster - orange														1	
Encruster - white										1					
Urochordata Cystodytes, Aplidium, Styela	1						1				1				
Cancer antennarius											1				
Chama arcana								2							
Encruster - yellow															
Florometra serratissima															
Hydroid, pink					1				1						
Oxylebius pictus															
Spirobranchus				2											
Zoanthid, colonial tan															
Aeolidioidea															
Amphianthus californica															
Bryozoa, white branching (colonies)															
Dermasterias imbricata															
Doridacea															
encrusting coralline										1					
Eudistylia polymorpha						1									
Hemigrapsus nudus															
Orthasterias koehleri															
Sebastes sp															
Sponge, cup tan															
Tunicate, encrusting tan															

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	080ga1329	079ga1329	078ga1329	077ga1328	076ga1328	075ga1327	073ga1326	072ga1326	071ga1325	070ga1325	068ga1324	067ga1323	066ga1323	065ga1323	064ga1322
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	48	53	55	61	63	68	70	72	75	84	87	89	91	93	104
Corynactis californica, individuals		350	14	525	315	560	595	693	560	595	455	525	630	693	420
Metridium exilis		72	7						3						140
Metridium senile	64	19	90	24	34	1					21	8			1
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc	2	10	5												
Ophiothrix spiculata															
Mytilus															
Desmophyllum															
Anthopleura elegantissima (rosy morph)															
Balanus sp															
Ophiuroid unid	34			3	5					2	3	3			
Metridium farcimen															
Worm tubes, plain															
Galathea californiensis															
Bare Metal															
Turf	1		1	1		1	1	1	1					1	
Balanus nubilus (?)			1			1		2	2	3		1	1		
Sponge, tan encrusting					1	1	1		1	1	1	1	1		1
Codium															
Worm tubes, calcareous															
Paracyathus stearnsi															
Sponge, yellow encrusting	1		1				1			1		1			1
Crassadoma gigantea		1													
Hydroid, tan branching															
Sponge, orange encrusting															
Sponge, green encrusting	1														
Sponge, white encrusting							1								
Coenocyathus bowersi (colonies)															
Sponge, purple encrusting			1	1	1										
Encruster - orange						1					1				
Encruster - white									1						
Urochordata Cystodytes, Aplidium, Styela															
Cancer antennarius						1									
Chama arcana															
Encruster - yellow		1													
Florometra serratissima											1				
Hydroid, pink															
Oxylebius pictus										1					1
Spirobranchus															
Zoanthid, colonial tan															
Aeolidioidea															
Amphianthus californica															
Bryozoa, white branching (colonies)															
Dermasterias imbricata															
Doridacea															
encrusting coralline															
Eudistylia polymorpha															
Hemigrapsus nudus															
Orthasterias koehleri															
Sebastes sp															
Sponge, cup tan															
Tunicate, encrusting tan															

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	063ga1321	062ga1318	061ga1316	060ga1315	059ga1315	057ga1314	056ga1313	055ga1312	054ga1312	053ga1311	052ga1310	051ga1309	050ga1309	049ga1308	048ga1306
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	118	125	127	131	134	137	147	156	162	168	173	184	186	192	216
Corynactis californica, individuals	630	693	693	560	420	630	693	665	630	350	490	245	630	14	525
Metridium exilis				40	103										
Metridium senile	7														
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc															
Ophiothrix spiculata				18											
Mytilus															
Desmophyllum															
Anthopleura elegantissima (rosy morph)															
Balanus sp															
Ophiuroid unid						10			6	12		8			
Metridium farcimen				1					1	2		1	2	6	1
Worm tubes, plain															
Galathea californiensis															
Bare Metal															
Turf	1	1	1	1	1	1			1	1	1	1	1	1	1
Balanus nubilus (?)	2		5	2	3	8		1							
Sponge, tan encrusting	1			1	1	1	1	1	1	1	1	1			
Codium															
Worm tubes, calcareous				1									4		11
Paracyathus stearnsi											6	12			
Sponge, yellow encrusting															
Crassadoma gigantea			2								2				
Hydroid, tan branching															
Sponge, orange encrusting															
Sponge, green encrusting															
Sponge, white encrusting											1				
Coenocyathus bowersi (colonies)										2		1			1
Sponge, purple encrusting															
Encruster - orange															
Encruster - white															
Urochordata Cystodytes, Aplidium, Styela															
Cancer antennarius															
Chama arcana															
Encruster - yellow															
Florometra serratissima															
Hydroid, pink															
Oxylebius pictus															
Spirobranchus															
Zoanthid, colonial tan															
Aeolidioidea															
Amphianthus californica															
Bryozoa, white branching (colonies)												1			
Dermasterias imbricata															
Doridacea															
encrusting coralline															
Eudistylia polymorpha															
Hemigrapsus nudus															
Orthasterias koehleri															
Sebastes sp															1
Sponge, cup tan															
Tunicate, encrusting tan															

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	047ga1305	046ga1305	045ga1258	044ga1257	043ga1256	041ga1253	040ga1252	039ga1251	038ga1248	037ga1247	036ga1245	035ga1243	034ga1239	033ga1238	032ga1235
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	225	231	302	309	326	363	367	372	397	410	420	423	459	479	507
Corynactis californica, individuals							83	2		10					
Metridium exilis															
Metridium senile	80	96	164	43	146	21	28	147	147	126	91	85	92	85	89
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc															
Ophiothrix spiculata				3	12		23	11	66	51	56	58	19	37	11
Mytilus															
Desmophyllum						2				2					
Anthopleura elegantissima (rosy morph)															
Balanus sp															
Ophiuroid unid	3	2													
Metridium farcimen		1													
Worm tubes, plain			23	12	7	12	4								
Galathea californiensis													1		1
Bare Metal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turf	1	1	1	1	1	1									
Balanus nubilus (?)															
Sponge, tan encrusting		1		1					1						
Codium															
Worm tubes, calcareous	3			1	1	6									
Paracyathus stearnsi															
Sponge, yellow encrusting															
Crassadoma gigantea															
Hydroid, tan branching															
Sponge, orange encrusting															
Sponge, green encrusting															
Sponge, white encrusting				1											
Coenocyathus bowersi (colonies)															
Sponge, purple encrusting															
Encruster - orange															
Encruster - white									1						
Urochordata Cystodytes, Aplidium, Styela															
Cancer antennarius															
Chama arcana															
Encruster - yellow															
Florometra serratissima				1		1									
Hydroid, pink															
Oxylebius pictus															
Spirobranchus															
Zoanthid, colonial tan															
Aeolidioidea				1											
Amphianthus californica															
Bryozoa, white branching (colonies)															
Dermasterias imbricata															
Doridacea															
encrusting coralline															
Eudistylia polymorpha															
Hemigrapsus nudus															
Orthasterias koehleri															
Sebastes sp															
Sponge, cup tan															
Tunicate, encrusting tan															

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	031ga1234	030ga1233	029ga1231	028ga1227	027ga1226	026ga1220	025ga1219	024ga1218	023ga1217	022ga1215	021ga1214	019ga1214	018ga1213	017ga1212	016ga1211
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	515	525	548	569	577	620	628	633	646	660	664	675	677	679	681
Corynactis californica, individuals															
Metridium exilis															
Metridium senile	87	82	111	107	179	213	178	162	91		113	192	146	44	90
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc															
Ophiothrix spiculata	34	23	19	10	30										
Mytilus															
Desmophyllum						6	8	6	1	19	13	3		34	12
Anthopleura elegantissima (rosy morph)															
Balanus sp															
Ophiuroid unid															
Metridium farcimen										88					
Worm tubes, plain									2	2					
Galathea californiensis		1				1	2	3	2	2		1	2	2	1
Bare Metal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Turf									1	1	1		1	1	1
Balanus nubilus (?)															
Sponge, tan encrusting										1					
Codium															
Worm tubes, calcareous															
Paracyathus stearnsi															
Sponge, yellow encrusting															
Crassadoma gigantea															
Hydroid, tan branching															
Sponge, orange encrusting															
Sponge, green encrusting															
Sponge, white encrusting															
Coenocyathus bowersi (colonies)															
Sponge, purple encrusting															
Encruster - orange															
Encruster - white															
Urochordata Cystodytes, Aplidium, Styela															
Cancer antennarius															
Chama arcana															
Encruster - yellow															
Florometra serratissima															
Hydroid, pink															
Oxylebius pictus															
Spirobranchus															
Zoanthid, colonial tan						1		1							
Aeolidioidea															
Amphianthus californica								1							
Bryozoa, white branching (colonies)															
Dermasterias imbricata															
Doridacea															
encrusting coralline															
Eudistylia polymorpha															
Hemigrapsus nudus															
Orthasterias koehleri															
Sebastes sp															
Sponge, cup tan		1													
Tunicate, encrusting tan												1			

Platform Gail - Leg A1 counts															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99						
PHOTO CODE	014ga1208	013ga1207	012ga1206	011ga1206	010ga1205	008ga1201	006ga1200	007ga1200							
LEG	A1	A1	A1	A1	A1	A1	A1	A1							
DEPTH (ft)	692	700	708	710	721	732	733	733.1				No. of			
									Total	Average	Photos	Occurrence	Max	Min	
Corynactis californica, individuals									15263	448.9118	98	34	693	2	
Metridium exilis									4554	146.9032	98	31	570	3	
Metridium senile	56	93	13	3	3		1	1	4227	60.38571	98	70	213	1	
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc									752	27.85185	98	27	70	2	
Ophiothrix spiculata									533	24.22727	98	22	66	2	
Mytilus									497	35.5	98	14	160	3	
Desmophyllum	43	20	42	33	53	54	38	27	416	21.89474	98	19	54	1	
Anthopleura elegantissima (rosy morph)									305	20.33333	98	15	100	1	
Balanus sp									145	9.0625	98	16	30	1	
Ophiuroid unid									113	7.533333	98	15	34	1	
Metridium farcimen									103	11.44444	98	9	88	1	
Worm tubes, plain									62	8.857143	98	7	23	2	
Galathea californiensis	2	3	4	2	5	5	3	4	47	2.35	98	20	5	1	
Bare Metal	1	1	1	1	1	1	1	1	38	1	98	38	1	1	
Turf	1								35	1	98	35	1	1	
Balanus nubilus (?)									32	2.461538	98	13	8	1	
Sponge, tan encrusting									31	1	98	31	1	1	
Codium									28	4.666667	98	6	10	2	
Worm tubes, calcareous									27	3.857143	98	7	11	1	
Paracyathus stearnsi									18	9	98	2	12	6	
Sponge, yellow encrusting									9	1	98	9	1	1	
Crassadoma gigantea									6	1.5	98	4	2	1	
Hydroid, tan branching									6	1	98	6	1	1	
Sponge, orange encrusting									6	1	98	6	1	1	
Sponge, green encrusting									5	1	98	5	1	1	
Sponge, white encrusting									5	1	98	5	1	1	
Coenocyathus bowersi (colonies)									4	1.333333	98	3	2	1	
Sponge, purple encrusting									4	1	98	4	1	1	
Encruster - orange									3	1	98	3	1	1	
Encruster - white									3	1	98	3	1	1	
Urochordata Cystodytes, Aplidium, Styela									3	1	98	3	1	1	
Cancer antennarius									2	1	98	2	1	1	
Chama arcana									2	2	98	1	2	2	
Encruster - yellow									2	1	98	2	1	1	
Florometra serratissima									2	1	98	2	1	1	
Hydroid, pink									2	1	98	2	1	1	
Oxylebius pictus									2	1	98	2	1	1	
Spirobranchus									2	2	98	1	2	2	
Zoanthid, colonial tan									2	1	98	2	1	1	
Aeolidioidea									1	1	98	1	1	1	
Amphianthus californica									1	1	98	1	1	1	
Bryozoa, white branching (colonies)									1	1	98	1	1	1	
Dermasterias imbricata							1		1	1	98	1	1	1	
Doridacea									1	1	98	1	1	1	
encrusting coralline									1	1	98	1	1	1	
Eudistylia polymorpha									1	1	98	1	1	1	
Hemigrapsus nudus									1	1	98	1	1	1	
Orthasterias koehlerii			1						1	1	98	1	1	1	
Sebastes sp									1	1	98	1	1	1	
Sponge, cup tan									1	1	98	1	1	1	
Tunicate, encrusting tan									1	1	98	1	1	1	

Platform Gail - Leg A1 %															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	022gaD	023gaD	029gaD	030gaD	021gaD	026gaD	027gaD	028gaD	024gaD	025gaD	031gaD	032gaD	019gaD	020gaD	017gaD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	4	4.1	5	5.1	6	6.1	6.2	6.3	7	7.1	7.2	7.3	9	9.1	12
Corynactis californica (%)															
Mytilus	90	60	80	55	35	50	5	70	75	60	60	70	70	65	
Metridium senile %	2	5	1	1		20	15		1	10	3	2	1	1	
Bare Metal (%)															
Anthopleura elegantissima (rosy morph) %	5	0.5					50			2	5	1	1	2	10
Metridium exilis %	5	35	5	40	60	30	10	30	20	25	5	15	20	30	70
Zoanthid, colonial tan %															
Turf (%)															
Hydroid, tan branching %		5		5	5						5	10		5	
Sponge, tan encrusting (%)															2
Tunicate, encrusting tan %															
Sponge, orange encrusting %															2
Sponge, purple encrusting %															
Hydroid, pink %															
Sponge, cup tan %															
Sponge, white encrusting (%)															
Encruster - white (%)															
Urochordata Cystodytes, Aplidium, Styela															
Sponge, yellow encrusting (%)															
Sponge, green encrusting %															
Encruster - orange (%)															
Encruster - yellow %															

Platform Gail - Leg A1 %															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	016gaD	015gaD	014gaD	013gaD	011gaD	010gaD	009gaD	008gaD	006gaD	088ga1336	005gaD	004gaD	087ga1335	085ga1334	082ga1332
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	14	16	18	21	24	28	30	31	34	36	36.1	38	39	42	45
Corynactis californica (%)									4				50		
Mytilus															
Metridium senile %	20	70	40	40	50		2	25	30			10	5	45	55
Bare Metal (%)															
Anthopleura elegantissima (rosy morph) %	30	99	40			100		50	1						
Metridium exilis %					2		40	2	20	15	60	80	10	4	5
Zoanthid, colonial tan %															
Turf (%)													2		
Hydroid, tan branching %															
Sponge, tan encrusting (%)					5		2	2	2		2	2		0.5	
Tunicate, encrusting tan %															
Sponge, orange encrusting %				0.5	10		1				2		2		
Sponge, purple encrusting %											1				
Hydroid, pink %					2				2						
Sponge, cup tan %															
Sponge, white encrusting (%)											5	1			
Encruster - white (%)										1					
Urochordata Cystodytes, Aplidium, Styela	2						1				1				
Sponge, yellow encrusting (%)					2				1						1
Sponge, green encrusting %							2				1	1			1
Encruster - orange (%)														0.5	
Encruster - yellow %															

Platform Gail - Leg A1 %															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	080ga1329	079ga1329	078ga1329	077ga1328	076ga1328	075ga1327	073ga1326	072ga1326	071ga1325	070ga1325	068ga1324	067ga1323	066ga1323	065ga1323	064ga1322
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	48	53	55	61	63	68	70	72	75	84	87	89	91	93	104
Corynactis californica (%)		50	2	75	45	80	85	98	80	85	65	75	90	98	60
Mytilus															
Metridium senile %	65	20	90	25	34	1					20	10			1
Bare Metal (%)															
Anthopleura elegantissima (rosy morph) %															
Metridium exilis %		15	2						1						25
Zoanthid, colonial tan %															
Turf (%)	20		5	5		2	10	2	2					1	
Hydroid, tan branching %															
Sponge, tan encrusting (%)					5	3	1		2	10	10	5	7		2
Tunicate, encrusting tan %															
Sponge, orange encrusting %															
Sponge, purple encrusting %			2	2	4										
Hydroid, pink %															
Sponge, cup tan %															
Sponge, white encrusting (%)							1								
Encruster - white (%)									2						
Urochordata Cystodytes, Aplidium, Styela															
Sponge, yellow encrusting (%)	0.5		1				0.5			1		2		2	
Sponge, green encrusting %	0.5														
Encruster - orange (%)						1							1		
Encruster - yellow %		0.5										1	1		

Platform Gail - Leg A1 %															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	063ga1321	062ga1318	061ga1316	060ga1315	059ga1315	057ga1314	056ga1313	055ga1312	054ga1312	053ga1311	052ga1310	051ga1309	050ga1309	049ga1308	048ga1306
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	118	125	127	131	134	137	147	156	162	168	173	184	186	192	216
Corynactis californica (%)	90	98	98	80	60	90	98	95	90	50	70	35	90	2	75
Mytilus															
Metridium senile %	7														
Bare Metal (%)															
Anthopleura elegantissima (rosy morph) %															
Metridium exilis %				8	25										
Zoanthid, colonial tan %															
Turf (%)	2	2	2	1	3	5			5	10	10	25	2	15	10
Hydroid, tan branching %															
Sponge, tan encrusting (%)	2			2	1	5	2	5	5	15	1	10			
Tunicate, encrusting tan %															
Sponge, orange encrusting %															
Sponge, purple encrusting %															
Hydroid, pink %															
Sponge, cup tan %															
Sponge, white encrusting (%)											1				
Encruster - white (%)															
Urochordata Cystodytes, Aplidium, Styela															
Sponge, yellow encrusting (%)															
Sponge, green encrusting %															
Encruster - orange (%)															
Encruster - yellow %															

Platform Gail - Leg A1 %															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	047ga1305	046ga1305	045ga1258	044ga1257	043ga1256	041ga1253	040ga1252	039ga1251	038ga1248	037ga1247	036ga1245	035ga1243	034ga1239	033ga1238	032ga1235
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	225	231	302	309	326	363	367	372	397	410	420	423	459	479	507
Corynactis californica (%)							10	1		1					
Mytilus															
Metridium senile %	80	80	95	45	73	49	30	39	85	90	85	85	90	60	90
Bare Metal (%)	5	2	20	40	25	50	60	60	10	10	15	15	10	40	10
Anthopleura elegantissima (rosy morph) %															
Metridium exilis %															
Zoanthid, colonial tan %															
Turf (%)	20	20	5	15	2	1									
Hydroid, tan branching %															
Sponge, tan encrusting (%)		5		1					5						
Tunicate, encrusting tan %															
Sponge, orange encrusting %															
Sponge, purple encrusting %															
Hydroid, pink %															
Sponge, cup tan %															
Sponge, white encrusting (%)				1											
Encruster - white (%)									1						
Urochordata Cystodytes, Aplidium, Styela															
Sponge, yellow encrusting (%)															
Sponge, green encrusting %															
Encruster - orange (%)															
Encruster - yellow %															

Platform Gail - Leg A1 %															
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99
PHOTO CODE	031ga1234	030ga1233	029ga1231	028ga1227	027ga1226	026ga1220	025ga1219	024ga1218	023ga1217	022ga1215	021ga1214	019ga1214	018ga1213	017ga1212	016ga1211
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	515	525	548	569	577	620	628	633	646	660	664	675	677	679	681
Corynactis californica (%)															
Mytilus															
Metridium senile %	85	80	67	85	70	70	80	60	44		33	75	69	59	59
Bare Metal (%)	15	20	33	15	30	30	20	40	55	66	66	25	30	40	40
Anthopleura elegantissima (rosy morph) %															
Metridium exilis %															
Zoanthid, colonial tan %						5		15							
Turf (%)									0.5	1	0.5		0.5	0.5	1
Hydroid, tan branching %															
Sponge, tan encrusting (%)										1					
Tunicate, encrusting tan %												3			
Sponge, orange encrusting %															
Sponge, purple encrusting %															
Hydroid, pink %															
Sponge, cup tan %		2													
Sponge, white encrusting (%)															
Encruster - white (%)															
Urochordata Cystodytes, Aplidium, Styela															
Sponge, yellow encrusting (%)															
Sponge, green encrusting %															
Encruster - orange (%)															
Encruster - yellow %															

Platform Gail - Leg A1 %														
DATE	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99	10/19/99						
PHOTO CODE	014ga1208	013ga1207	012ga1206	011ga1206	010ga1205	008ga1201	006ga1200	007ga1200						
LEG	A1	A1	A1	A1	A1	A1	A1	A1				No. of		
DEPTH (ft)	692	700	708	710	721	732	733	733.1	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica (%)									2175	63.97059	98	34	98	1
Mytilus									845	60.35714	98	14	90	5
Metridium senile %	54	70	41	5	5			1	2916	41.65714	98	70	95	1
Bare Metal (%)	40	30	59	50	40	50	50	50	1266	33.31579	98	38	66	2
Anthopleura elegantissima (rosy morph) %									396.5	26.43333	98	15	100	0.5
Metridium exilis %									714	23.03226	98	31	80	1
Zoanthid, colonial tan %									20	10	98	2	15	5
Turf (%)	0.4								208.4	5.954286	98	35	25	0.4
Hydroid, tan branching %									35	5.833333	98	6	10	5
Sponge, tan encrusting (%)									122.5	3.951613	98	31	15	0.5
Tunicate, encrusting tan %									3	3	98	1	3	3
Sponge, orange encrusting %									17.5	2.916667	98	6	10	0.5
Sponge, purple encrusting %									9	2.25	98	4	4	1
Hydroid, pink %									4	2	98	2	2	2
Sponge, cup tan %									2	2	98	1	2	2
Sponge, white encrusting (%)									9	1.8	98	5	5	1
Encruster - white (%)									4	1.333333	98	3	2	1
Urochordata Cystodytes, Aplidium, Styela									4	1.333333	98	3	2	1
Sponge, yellow encrusting (%)									11	1.222222	98	9	2	0.5
Sponge, green encrusting %									5.5	1.1	98	5	2	0.5
Encruster - orange (%)									2.5	0.833333	98	3	1	0.5
Encruster - yellow %									1.5	0.75	98	2	1	0.5

Platform Gail - Leg B1 counts																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	034gaD	032gaD	033gaD	035gaD	030gaD	031gaD	027gaD	028gaD	029gaD	023gaD	024gaD	025gaD	026gaD	022gaD	021gaD	020gaD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	3	4	4.1	4.2	5	5.1	6	6.1	7	8	8.1	8.2	8.3	9	12	14
Metridium exilis	100	315	165		552	415	400	405	550	490	420	450	415	420	555	540
Corynactis californica, individuals																
Metridium senile	73	14	56	5		16										
Mytilus	70	34	87	26	25	38	34	36	21	32	38	34	27	49	9	13
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc							5	10	2	15	15	20	30	20		3
Desmophyllum																
Ophiothrix spiculata																
Balanus sp	23	11	25	23	4	17	18	14	3			11	6	10		
Worm tubes, calcareous																
Protula superba																
Worm tubes, plain																
Amphipholis																
Ophiuroid unid																
Turf																
Bare Metal											1			1		
Sponge, tan encrusting	1		1	1	1	1	1									
Paracyathus stearnsi																
Sponge, yellow encrusting					1	1			1			1				
Galathea californiensis																
Sponge, green encrusting					1											
Ophiocantha diplasia																
Encruster - white																
Sponge, purple encrusting																
Balanus nubilus (?)																
Sponge, cup tan																
Sponge, white encrusting											1					
Zoanthid , solitary tan																
Zoanthid, tan (Palythoa)																
Encruster - orange																
Cup Coral, white																
Filamentous green alga																
Foliose red algae				1		1										
Hydroid, white						1	1	1								
Actiniaria, pink																
Aplidium																
Crassadoma gigantea																
Encruster - tan																
Encruster - yellow																
Hydroid, tan branching																
Leucetta																
Pleurobranchaea californica																
Sebastes sp																
Stylasterias forreri																
Tunicate, globular																
Allocentrotus fragilis																
Asterina miniata = Patiria																
Bryozoa, tan branching (colonies)																
Chiton, unid																
Doridacea		1														
Gorgonian, unid																
Halichondria panicea																
Pisaster giganteus																
Pycnopodia helianthoides																
Sponge, orange encrusting																
Sponge, tan globose																
Urochordata Cystodytes, Aplidium, Styela				1												

Platform Gail - Leg B1 counts																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	019gaD	018gaD	017gaD	016gaD	015gaD	014gaD	013gaD	012gaD	011gaD	010gaD	009gaD	008gaD	007gaD	006gaD	005gaD	004gaD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	16	18	21	22	24	28	30	31	33	34	36	38	42	53	57	58
Metridium exilis	554	485	480	418	475	551	550	415	550	415	548	545	553	580	420	315
Corynactis californica, individuals															140	140
Metridium senile																9
Mytilus		4	6	6	4	4				3	3		2	2		
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc	10	20	15	20	20	2	5	15	10	2	15	5	15	1		
Desmophyllum																
Ophiothrix spiculata																
Balanus sp			4		1		3		2	1			1		3	
Worm tubes, calcareous																
Protula superba																
Worm tubes, plain																
Amphipholis																
Ophiuroid unid						2			2		1		1	3		
Turf																
Bare Metal					1											
Sponge, tan encrusting						1		1	1			1				1
Paracyathus stearnsi																
Sponge, yellow encrusting	1	1	1	1			1				1	1	1	1	1	1
Galathea californiensis																
Sponge, green encrusting		1	1				1	1		1		1	1	1	1	1
Ophiocantha diplasia																
Encruster - white																
Sponge, purple encrusting								1	1				1		1	
Balanus nubilus (?)																
Sponge, cup tan																
Sponge, white encrusting	1		1													
Zoanthid , solitary tan																
Zoanthid, tan (Palythoa)																
Encruster - orange																
Cup Coral, white																
Filamentous green alga				1				1					1			
Foliose red algae																1
Hydroid, white																
Actiniaria, pink																
Aplidium	1			1												
Crassadoma gigantea		1														
Encruster - tan																
Encruster - yellow																
Hydroid, tan branching																1
Leucetta					1											
Pleurobranchaea californica																
Sebastes sp																
Stylasterias forreri																
Tunicate, globular																
Allocentrotus fragilis																
Asterina miniata = Patiria																
Bryozoa, tan branching (colonies)																
Chiton, unid																
Doridacea																
Gorgonian, unid																
Halichondria panicea										1						
Pisaster giganteus																
Pycnopodia helianthoides																
Sponge, orange encrusting					1											
Sponge, tan globose											1					
Urochordata Cystodytes, Aplidium, Styela																

Platform Gail - Leg B1 counts																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	003gaD	002gaD	084ga1348	082ga1346	080ga1345	077ga1344	076ga1344	075ga1342	073ga1338	72ga1338	071ga1337	070ga1337	069ga1332	068ga1332	067ga1331	066ga1331
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	59	60	61	63	71	73	74	78	86	97	99	103	123	127	131	137
Metridium exilis	150	280	400	200	200		300	80	100	250	420	288	65	280	440	368
Corynactis californica, individuals	40			350	140	630	140	560	350	35	70			100		
Metridium senile	30	5														
Mytilus																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc	1	1														
Desmophyllum																
Ophiothrix spiculata	4	1		9					8	25			9			
Balanus sp																
Worm tubes, calcareous																
Protula superba																
Worm tubes, plain																
Amphipholis																
Ophiuroid unid	2	6	3		1	3	8	1			5			3		
Turf																
Bare Metal										1			1			
Sponge, tan encrusting	1	1	1	1	1	1					1	1		1	1	1
Paracyathus stearnsi																
Sponge, yellow encrusting	1		1							1	1	1		1	1	1
Galathea californiensis																
Sponge, green encrusting	1					1	1	1		1						
Ophiocantha diplasia																
Encruster - white				1												
Sponge, purple encrusting	1	1	1	1	1											
Balanus nubilus (?)			2	1		1	1				2				1	
Sponge, cup tan								1					1			
Sponge, white encrusting																1
Zoanthid , solitary tan																
Zoanthid, tan (Palythoa)																
Encruster - orange													1			1
Cup Coral, white																
Filamentous green alga																
Foliose red algae																
Hydroid, white																
Actiniaria, pink																
Aplidium																
Crassadoma gigantea							1									
Encruster - tan																
Encruster - yellow										1						
Hydroid, tan branching	1															
Leucetta		1														
Pleurobranchaea californica																
Sebastes sp																
Stylasterias forreri																
Tunicate, globular																
Allocentrotus fragilis																
Asterina miniata = Patiria																
Bryozoa, tan branching (colonies)																
Chiton, unid																
Doridacea																
Gorgonian, unid																
Halichondria panicea																
Pisaster giganteus																
Pycnopodia helianthoides																
Sponge, orange encrusting																
Sponge, tan globose																
Urochordata Cystodytes, Aplidium, Styela																

Platform Gail - Leg B1 counts																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	065ga1330	064ga1330	063ga1330	062ga1329	061ga1329	060ga1327	059ga1327	058ga1326	057ga1325	056ga1317	054ga1316	053ga1314	52ga1312	051ga1312	050ga1311	049ga1311
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	141	143	146	149	153	168	171	179	186	231	261	276	294	308	309	315
Metridium exilis	324	372	412	392	124	328	172	200	220	220					2	2
Corynactis californica, individuals	20				140						41	1	65			3
Metridium senile											3	1	2			2
Mytilus																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																
Desmophyllum																
Ophiothrix spiculata																
Balanus sp																
Worm tubes, calcareous										10	13	16	26	5	4	3
Protula superba											7	10	6	28	23	26
Worm tubes, plain														27	20	13
Amphipholis																
Ophiuroid unid			1			2										
Turf						1	1	1	1	1	1	1	1	1	1	1
Bare Metal																
Sponge, tan encrusting	1		1	1	1	1	1	1	1			1	1	1	1	1
Paracyathus stearnsi											5	6	3	5	7	1
Sponge, yellow encrusting	1	1	1		1											
Galathea californiensis																
Sponge, green encrusting																
Ophiocantha diplasia																
Encruster - white																
Sponge, purple encrusting																
Balanus nubilus (?)																
Sponge, cup tan		1														
Sponge, white encrusting																
Zoanthid , solitary tan																
Zoanthid, tan (Palythoa)																
Encruster - orange		1		1												
Cup Coral, white																
Filamentous green alga																
Foliose red algae																
Hydroid, white																
Actiniaria, pink																
Aplidium																
Crassadoma gigantea																
Encruster - tan																
Encruster - yellow							1									
Hydroid, tan branching																
Leucetta																
Pleurobranchaea californica																
Sebastes sp															1	
Stylasterias forreri																
Tunicate, globular													1			1
Allocentrotus fragilis																
Asterina miniata = Patiria																
Bryozoa, tan branching (colonies)																
Chiton, unid																
Doridacea																
Gorgonian, unid																
Halichondria panicea																
Pisaster giganteus																
Pycnopodia helianthoides																
Sponge, orange encrusting																
Sponge, tan globose																
Urochordata Cystodytes, Aplidium, Styela																

Platform Gail - Leg B1 counts																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	048ga1311	046ga1308	045ga1308	042ga1305	041ga1303	039ga1302	038ga1300	037ga1300	036ga1259	035ga1259	034ga1257	033ga1256	032ga1254	031ga1253	030ga1252	029ga1249
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	322	363	365	376	413	420	454	459	460	464	492	500	518	541	543	594
Metridium exilis	2											100				
Corynactis californica, individuals	70															
Metridium senile	1	1	1	7	5	12	113	160	157	169	140	82	76	75	78	23
Mytilus																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																
Desmophyllum																2
Ophiothrix spiculata		2		5			8	28	28	51	28					
Balanus sp																
Worm tubes, calcareous	14	7	10	13	18	18										
Protula superba	17	10	10	14	2	1						1				
Worm tubes, plain	5	7	9	4	2	1										6
Amphipholis												9	3	3	6	3
Ophiuroid unid							2	4	1							
Turf	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
Bare Metal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sponge, tan encrusting																
Paracyathus stearnsi					1											
Sponge, yellow encrusting																
Galathea californiensis										1				1		
Sponge, green encrusting																
Ophiocantha diplasia								2	1			1		2	5	1
Encruster - white	1	1														1
Sponge, purple encrusting																
Balanus nubilus (?)																
Sponge, cup tan																1
Sponge, white encrusting																
Zoanthid , solitary tan																
Zoanthid, tan (Palythoa)													1			1
Encruster - orange																
Cup Coral, white																
Filamentous green alga																
Foliose red algae																
Hydroid, white																
Actiniaria, pink																
Aplidium																
Crassadoma gigantea																
Encruster - tan																
Encruster - yellow																
Hydroid, tan branching																
Leucetta																
Pleurobranchaea californica																
Sebastes sp				1												
Stylasterias forreri																
Tunicate, globular																
Allocentrotus fragilis																
Asterina miniata = Patiria																
Bryozoa, tan branching (colonies)																
Chiton, unid																
Doridacea																
Gorgonian, unid			1													
Halichondria panicea																
Pisaster giganteus																
Pycnopodia helianthoides																
Sponge, orange encrusting																
Sponge, tan globose																
Urochordata Cystodytes, Aplidium, Styela																

Platform Gail - Leg B1 counts																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	028ga1249	027ga1247	026ga1246	025ga1245	024ga1244	023ga1244	022ga1243	021ga1242	020ga1241	019ga1241	018ga1240	017ga1240	016ga1239	015ga1239	014ga1236	013ga1235
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	602	615	630	662	670	675	678	680	684	689	698	700	704	708	713	732
Metridium exilis																
Corynactis californica, individuals																
Metridium senile	59	66	40	9	4	5	17	6	15	20		1	1			
Mytilus																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																
Desmophyllum	6		6	11	9	14	12	18	15	7	7	17	17	17	37	11
Ophiothrix spiculata																
Balanus sp																
Worm tubes, calcareous																
Protula superba																
Worm tubes, plain		2		1	3	1	2		1		2	2		3		6
Amphipholis	9	5	5	6	6	3	3	5	1	2		3	3	5	2	
Ophiuroid unid										2						
Turf	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Bare Metal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Sponge, tan encrusting		1				1	1	1								
Paracyathus stearnsi																
Sponge, yellow encrusting																
Galathea californiensis	1			1	1	2	1	2	2	2	2		1		2	
Sponge, green encrusting																
Ophiocantha diplasia								2	1							
Encruster - white	1				1	1		1			1					
Sponge, purple encrusting																
Balanus nubilus (?)																
Sponge, cup tan												1		1		
Sponge, white encrusting										1						
Zoanthid , solitary tan									2				1			2
Zoanthid, tan (Palythoa)								1	1						1	
Encruster - orange																
Cup Coral, white																
Filamentous green alga																
Foliose red algae																
Hydroid, white																
Actiniaria, pink		2														
Aplidium																
Crassadoma gigantea																
Encruster - tan					1									1		
Encruster - yellow																
Hydroid, tan branching																
Leucetta																
Pleurobranchaea californica																
Sebastes sp																
Stylasterias forreri															1	
Tunicate, globular																
Allocentrotus fragilis								1								
Asterina miniata = Patiria												1				
Bryozoa, tan branching (colonies)				1												
Chiton, unid									1							
Doridacea																
Gorgonian, unid																
Halichondria panicea																
Pisaster giganteus				1												
Pycnopodia helianthoides																
Sponge, orange encrusting																
Sponge, tan globose																
Urochordata Cystodytes, Aplidium, Styela																

Platform Gail - Leg B1 counts								
DATE	10/16/99	10/16/99						
PHOTO CODE	012ga1235	011ga1234						
LEG	B1	B1			No. of			
DEPTH (ft)	734	736	Total	Average	Photos	Occurrence	Max	Min
Metridium exilis			20739	339.9836	98	61	580	2
Corynactis californica, individuals			3035	159.7368	98	19	630	1
Metridium senile	28	76	1669	38.81395	98	43	169	1
Mytilus			607	24.28	98	25	87	2
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc			277	11.08	98	25	30	1
Desmophyllum	4		210	12.35294	98	17	37	2
Ophiothrix spiculata			206	15.84615	98	13	51	1
Balanus sp			180	9.473684	98	19	25	1
Worm tubes, calcareous	1		158	11.28571	98	14	26	1
Protula superba			155	11.92308	98	13	28	1
Worm tubes, plain	4	3	124	5.636364	98	22	27	1
Amphipholis			82	4.315789	98	19	9	1
Ophiuroid unid			53	2.65	98	20	8	1
Turf	1	1	46	1	98	46	1	1
Bare Metal	1	1	42	1	98	42	1	1
Sponge, tan encrusting			34	1	98	34	1	1
Paracyathus stearnsi			28	4	98	7	7	1
Sponge, yellow encrusting			27	1	98	27	1	1
Galathea californiensis			19	1.461538	98	13	2	1
Sponge, green encrusting			17	1	98	17	1	1
Ophiocantha diplasia			15	1.875	98	8	5	1
Encruster - white			9	1	98	9	1	1
Sponge, purple encrusting			9	1	98	9	1	1
Balanus nubilus (?)			8	1.333333	98	6	2	1
Sponge, cup tan			6	1	98	6	1	1
Sponge, white encrusting			5	1	98	5	1	1
Zoanthid , solitary tan			5	1.666667	98	3	2	1
Zoanthid, tan (Palythoa)			5	1	98	5	1	1
Encruster - orange			4	1	98	4	1	1
Cup Coral, white	3		3	3	98	1	3	3
Filamentous green alga			3	1	98	3	1	1
Foliose red algae			3	1	98	3	1	1
Hydroid, white			3	1	98	3	1	1
Actiniaria, pink			2	2	98	1	2	2
Aplidium			2	1	98	2	1	1
Crassadoma gigantea			2	1	98	2	1	1
Encruster - tan			2	1	98	2	1	1
Encruster - yellow			2	1	98	2	1	1
Hydroid, tan branching			2	1	98	2	1	1
Leucetta			2	1	98	2	1	1
Pleurobranchaea californica		2	2	2	98	1	2	2
Sebastes sp			2	1	98	2	1	1
Stylasterias forreri	1		2	1	98	2	1	1
Tunicate, globular			2	1	98	2	1	1
Allocentrotus fragilis			1	1	98	1	1	1
Asterina miniata = Patiria			1	1	98	1	1	1
Bryozoa, tan branching (colonies)			1	1	98	1	1	1
Chiton, unid			1	1	98	1	1	1
Doridacea			1	1	98	1	1	1
Gorgonian, unid			1	1	98	1	1	1
Halichondria panicea			1	1	98	1	1	1
Pisaster giganteus			1	1	98	1	1	1
Pycnopodia helianthoides		1	1	1	98	1	1	1
Sponge, orange encrusting			1	1	98	1	1	1
Sponge, tan globose			1	1	98	1	1	1
Urochordata Cystodytes, Aplidium, Styela			1	1	98	1	1	1

Platform Gail - Leg B1 %																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	034gaD	032gaD	033gaD	035gaD	030gaD	031gaD	027gaD	028gaD	029gaD	023gaD	024gaD	025gaD	026gaD	022gaD	021gaD	020gaD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	3	4	4.1	4.2	5	5.1	6	6.1	7	8	8.1	8.2	8.3	9	12	14
Metridium exilis %	15	50	25		90	65	60	65	90	80	70	75	70	70	90	90
Bare Metal (%)											15			5		
Metridium senile %	25	5	20	2		5										
Halichondria panicea %																
Corynactis californica (%)																
Mytilus	45	45	50	85	5	20	25	25	10	20	10	15	20	25	10	10
Sponge, tan encrusting (%)	3		5	1	2	2	5									
Leucetta %																
Sponge, tan globose (%)																
Sponge, cup tan %																
Turf (%)																
Zoanthid, tan (Palythoa) (%)																
Encruster - tan (%)																
Hydroid, tan branching %																
Sponge, yellow encrusting (%)					0.5	2			1			0.5				
Hydroid, white %						1	2	5								
Filamentous green alga %																
Sponge, purple encrusting %																
Sponge, orange encrusting %																
Sponge, green encrusting %					2											
Foliose red algae %				2		2										
Encruster - white (%)																
Aplidium %																
Encruster - orange (%)																
Sponge, white encrusting (%)											3					
Urochordata Cystodytes, Aplidium, Styela				1												
Encruster - yellow %																

Platform Gail - Leg B1 %																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	019gaD	018gaD	017gaD	016gaD	015gaD	014gaD	013gaD	012gaD	011gaD	010gaD	009gaD	008gaD	007gaD	006gaD	005gaD	004gaD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	16	18	21	22	24	28	30	31	33	34	36	38	42	53	57	58
Metridium exilis %	90	80	80	70	80	90	90	85	90	70	90	90	90	95	85	50
Bare Metal (%)					2											
Metridium senile %																10
Halichondria panicea %										30						
Corynactis californica (%)															20	20
Mytilus		10	10	10	5	5				5	5		5	5		
Sponge, tan encrusting (%)						2		2	5			5				2
Leucetta %					10											
Sponge, tan globose (%)											10					
Sponge, cup tan %																
Turf (%)																
Zoanthid, tan (Palythoa) (%)																
Encruster - tan (%)																
Hydroid, tan branching %																5
Sponge, yellow encrusting (%)	2	1	3	5			3				10	5	20	5	5	2
Hydroid, white %																
Filamentous green alga %				0.5				1					5			
Sponge, purple encrusting %								1	2				0.5		0.5	
Sponge, orange encrusting %					2											
Sponge, green encrusting %		0.5	0.5			2	0.5		3			0.5	0.5	2	2	3
Foliose red algae %																1
Encruster - white (%)																
Aplidium %	1			2												
Encruster - orange (%)																
Sponge, white encrusting (%)	0.5		1													
Urochordata Cystodytes, Aplidium, Styela																
Encruster - yellow %																

Platform Gail - Leg B1 %																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	003gaD	002gaD	084ga1348	082ga1346	080ga1345	077ga1344	076ga1344	075ga1342	073ga1338	72ga1338	071ga1337	070ga1337	069ga1332	068ga1332	067ga1331	066ga1331
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	59	60	61	63	71	73	74	78	86	97	99	103	123	127	131	137
Metridium exilis %	25	70	85	50	70		72	20	35	65	85	40	10	45	85	68
Bare Metal (%)																
Metridium senile %	40	10														
Halichondria panicea %																
Corynactis californica (%)	6			50	20	90	20	80	50	5	10			15		
Mytilus																
Sponge, tan encrusting (%)	1	10	0.5	2	5	1					25	50		30	30	30
Leucetta %		10														
Sponge, tan globose (%)																
Sponge, cup tan %								1					46			
Turf (%)										0.5			0.5			
Zoanthid, tan (Palythoa) (%)																
Encruster - tan (%)																
Hydroid, tan branching %	2															
Sponge, yellow encrusting (%)	2		0.5													
Hydroid, white %																
Filamentous green alga %																
Sponge, purple encrusting %	3	3	5	2	2											
Sponge, orange encrusting %																
Sponge, green encrusting %	5				0.5	1	7		1	2						
Foliose red algae %																
Encruster - white (%)				1												
Aplidium %																
Encruster - orange (%)													2			1
Sponge, white encrusting (%)																1
Urochordata Cystodytes, Aplidium, Styela																
Encruster - yellow %									0.5							

Platform Gail - Leg B1 %																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	065ga1330	064ga1330	063ga1330	062ga1329	061ga1329	060ga1327	059ga1327	058ga1326	057ga1325	056ga1317	054ga1316	053ga1314	52ga1312	051ga1312	050ga1311	049ga1311
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	141	143	146	149	153	168	171	179	186	231	261	276	294	308	309	315
Metridium exilis %	65	85	84	88	20	75	45	45	50	50				1	1	1
Bare Metal (%)												60	75	50	60	60
Metridium senile %											3	1	5		10	25
Halichondria panicea %																
Corynactis californica (%)	3				20						3	0.5	10			0.5
Mytilus																
Sponge, tan encrusting (%)	20		15	10	35	10	5	20	1							
Leucetta %																
Sponge, tan globose (%)																
Sponge, cup tan %		5														
Turf (%)						5	5	5	15	25	5	30	10	20	30	10
Zoanthid, tan (Palythoa) (%)																
Encruster - tan (%)																
Hydroid, tan branching %																
Sponge, yellow encrusting (%)	2	5	1		10											
Hydroid, white %																
Filamentous green alga %																
Sponge, purple encrusting %																
Sponge, orange encrusting %																
Sponge, green encrusting %																
Foliose red algae %																
Encruster - white (%)																
Aplidium %																
Encruster - orange (%)		2		0.5												
Sponge, white encrusting (%)																
Urochordata Cystodytes, Aplidium, Styela																
Encruster - yellow %							0.5									

Platform Gail - Leg B1 %																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	048ga1311	046ga1308	045ga1308	042ga1305	041ga1303	039ga1302	038ga1300	037ga1300	036ga1259	035ga1259	034ga1257	033ga1256	032ga1254	031ga1253	030ga1252	029ga1249
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	322	363	365	376	413	420	454	459	460	464	492	500	518	541	543	594
Metridium exilis %	1												15			
Bare Metal (%)	60	65	75	80	85	85	50	15	20	20	20	30	30	40	20	50
Metridium senile %	20	5	5	10	5	5	49	84	79	80	80	68	50	55	75	45
Halichondria panicea %																
Corynactis californica (%)	10															
Mytilus																
Sponge, tan encrusting (%)																
Leucetta %																
Sponge, tan globose (%)																
Sponge, cup tan %																0.5
Turf (%)	5	30	20	10	10	10	0.5	0.5	0.5		0.5	2	5	5	5	5
Zoanthid, tan (Palythoa) (%)													5	5	5	15
Encruster - tan (%)																
Hydroid, tan branching %																
Sponge, yellow encrusting (%)																
Hydroid, white %																
Filamentous green alga %																
Sponge, purple encrusting %																
Sponge, orange encrusting %																
Sponge, green encrusting %																
Foliose red algae %																
Encruster - white (%)	1	2														0.5
Aplidium %																
Encruster - orange (%)																
Sponge, white encrusting (%)																
Urochordata Cystodytes, Aplidium, Styela																
Encruster - yellow %																

Platform Gail - Leg B1 %																
DATE	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99	10/16/99
PHOTO CODE	028ga1249	027ga1247	026ga1246	025ga1245	024ga1244	023ga1244	022ga1243	021ga1242	020ga1241	019ga1241	018ga1240	017ga1240	016ga1239	015ga1239	014ga1236	013ga1235
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	602	615	630	662	670	675	678	680	684	689	698	700	704	708	713	732
Metridium exilis %																
Bare Metal (%)	35	40	40	40	80	40	40	40	68	60	60	60	70	60	40	80
Metridium senile %	60	55	58	50	10	50	50	38	20	30		10	10			
Halichondria panicea %																
Corynactis californica (%)																
Mytilus																
Sponge, tan encrusting (%)		10				3	4	5								
Leucetta %																
Sponge, tan globose (%)																
Sponge, cup tan %												2				
Turf (%)	5	5	2	10	10	10	10	10	10	10	5	5	5	5	2	3
Zoanthid, tan (Palythoa) (%)								2	2						10	
Encruster - tan (%)					2									5		
Hydroid, tan branching %																
Sponge, yellow encrusting (%)																
Hydroid, white %																
Filamentous green alga %																
Sponge, purple encrusting %																
Sponge, orange encrusting %																
Sponge, green encrusting %																
Foliose red algae %																
Encruster - white (%)	0.5				0.5	2		1			5					
Aplidium %																
Encruster - orange (%)																
Sponge, white encrusting (%)										1						
Urochordata Cystodytes, Aplidium, Styela																
Encruster - yellow %																

Platform Gail - Leg B1 %								
DATE	10/16/99	10/16/99						
PHOTO CODE	012ga1235	011ga1234						
LEG	B1	B1			No. of			
DEPTH (ft)	734	736	Total	Average	Photos	Occurrence	Max	Min
Metridium exilis %			3781	61.98361	98	61	95	1
Bare Metal (%)	65	75	2065	49.16667	98	42	85	2
Metridium senile %	25	24	1366	31.76744	98	43	84	1
Halichondria panicea %			30	30	98	1	30	30
Corynactis californica (%)			433	22.78947	98	19	90	0.5
Mytilus			480	19.2	98	25	85	5
Sponge, tan encrusting (%)			356.5	10.48529	98	34	50	0.5
Leucetta %			20	10	98	2	10	10
Sponge, tan globose (%)			10	10	98	1	10	10
Sponge, cup tan %			59.5	9.916667	98	6	46	0.5
Turf (%)	10	1	388	8.434783	98	46	30	0.5
Zoanthid, tan (Palythoa) (%)			34	6.8	98	5	15	2
Encruster - tan (%)			7	3.5	98	2	5	2
Hydroid, tan branching %			7	3.5	98	2	5	2
Sponge, yellow encrusting (%)			94	3.481481	98	27	20	0.5
Hydroid, white %			8	2.666667	98	3	5	1
Filamentous green alga %			6.5	2.166667	98	3	5	0.5
Sponge, purple encrusting %			19	2.111111	98	9	5	0.5
Sponge, orange encrusting %			2	2	98	1	2	2
Sponge, green encrusting %			33	1.941176	98	17	7	0.5
Foliose red algae %			5	1.666667	98	3	2	1
Encruster - white (%)			13.5	1.5	98	9	5	0.5
Aplidium %			3	1.5	98	2	2	1
Encruster - orange (%)			5.5	1.375	98	4	2	0.5
Sponge, white encrusting (%)			6.5	1.3	98	5	3	0.5
Urochordata Cystodytes, Aplidium, Styela			1	1	98	1	1	1
Encruster - yellow %			1	0.5	98	2	0.5	0.5

Platform Grace - Leg C1 counts																		
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99
PHOTO CODE	026grD	027grD	024grD	025grD	028grD	022grD	023grD	020grD	021grD	029grD	017grD	018grD	019grD	016grD	015grD	014grD	013grD	012grD
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	3	3.1	4	4.1	4.2	5	5.1	6	6.1	6.2	7	7.1	7.2	8	8.1	10	15	16
Corynactis californica, individuals																		
Paracalythus stearnsi																		
Mytilus	77	73	82	99	84	81	136	73	89	67		190	77		72	68	26	50
Ophiothrix spiculata	9	10		2	25					32				1	27	40	50	100
Balanus spp	19	29	48	26	24	64	53	45	44	34	32		26		68	30	6	4
Anthopleura elegantissima (rosy morph)														1	2	9	30	30
Mytilus californianus											64			60				
Worm tubes, calcareous																		
Coenoclyathus bowersi (colonies)																		
Turf	1		1	1	1	1	1	1	1	1				1	1		1	1
Balanus sp												21		42				
Metridium senile	36	2		12											3			
filamentous reds Polysiphonia, Neoptilota, Antithamion etc		1	1		1	1	1	1	1		1	1	1	1	1	1	1	1
Crassadoma gigantea																		
Sponge, tan encrusting																	1	1
Sponge, yellow encrusting																		
Asterina miniata = Patiria																		
Bryozoa, tan branching (colonies)																		
Balanus nubilus (?)																		
Hydroid, pink																		
Ophiuroid unid																		
Anthopleura xanthogrammica					2					4								
Hydroid, tan branching											1		1	1				
Sponge, white encrusting							1		1									
Urticina	2				2													
Bryozoa, white branching (colonies)																		
Sebastes sp																		
Sponge, gray encrusting																		
Sponge, purple encrusting																		
Strongylocentrotus purpuratus					1					2								
Stylasterias forreri																		
Anemone, unid					2													
Bare Metal																		
Dorid, yellow (?Doriopsilla)																		
Hermisenda crassicornis																		
Leucilla nuttingi (colonies)																		
Metridium farcimen																		
Parastichopus californicus																		
Anemone, pink				1														
Anisodoris nobilis																		
Bryozoa turf												1						
Dialula sandiegensis																		1
Hydroid, tan																1		
Oxylebius pictus																		
Styela sp																		

Platform Grace - Leg C1 counts																					
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/23/99	10/24/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99			
PHOTO CODE	010grD	011grD	009grD	008grD	007grD	006grD	005grD	004grD	003grD	065gr1322	002grD	064gr1321	062gr1319	060gr1318	059gr1318	057gr1317	055gr1315	054gr1314			
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1			
DEPTH (ft)	19	19.1	22	24	25	28	30	31	34	35	35.1	38	52	55	58	61	65	70			
Corynactis californica, individuals										135			30		310	130	370	200	300	390	450
Paracalythus stearnsi																					
Mytilus	13																				
Ophiothrix spiculata				3	15	35		2	17	60	4	72	180	21	38	8					
Balanus spp	4	1	3	3	1																
Anthopleura elegantissima (rosy morph)	25	60	20	20	20	30	30	40	41	20	62										
Mytilus californianus																					
Worm tubes, calcareous																					
Coenoclyathus bowersi (colonies)																					
Turf	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1	1			
Balanus sp																					
Metridium senile																					
filamentous reds Polysiphonia, Neoptilota, Anthamion etc	1	1	1	1	1	1	1		1		1					1					
Crassadoma gigantea																					5
Sponge, tan encrusting	1		1	1		1	1	1	1		1		1	1		1					
Sponge, yellow encrusting														1	1	1	1				
Asterina miniata = Patiria																					
Bryozoa, tan branching (colonies)																					
Balanus nubilus (?)																					
Hydroid, pink																					
Ophiuroid unid																					
Anthopleura xanthogrammica																					
Hydroid, tan branching																					
Sponge, white encrusting																					
Urticina																					
Bryozoa, white branching (colonies)																					
Sebastes sp																					
Sponge, gray encrusting													1								
Sponge, purple encrusting								1	1												
Strongylocentrotus purpuratus																					
Stylasterias forreri																					
Anemone, unid																					
Bare Metal																					
Dorid, yellow (?Doriopsilla)																					
Hermisenda crassicornis																					
Leucilla nuttingi (colonies)																					
Metridium farcimen																					
Parastichopus californicus																					
Anemone, pink																					
Anisodoris nobilis																					
Bryozoa turf																					
Dialula sandiegensis																					
Hydroid, tan																					
Oxylebius pictus																					
Styela sp												1									

Platform Grace - Leg C1 counts																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	051gr1312	050gr1312	047gr1309	043gr1306	037gr1303	035gr1302	036gr1302	034gr1301	032gr1258	031gr1256	030gr1255	029gr1254	028gr1253	027gr1252	026gr1251	025gr1251	024gr1250	023gr1249
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	73	77	81	84	87	88	88.1	93	111	119	126	131	136	144	148	150	153	159
Corynactis californica, individuals	385	380	260	250	390	260	400	190	150	180	155	95	120	95	17	36	41	159
Paracalyptus stearnsi									8	8	34	96	72	117	129	179	125	107
Mytilus																		
Ophiothrix spiculata					4	37		15	14	45	26	35	20	24	4		4	
Balanus spp																		
Anthopleura elegantissima (rosy morph)			1															
Mytilus californianus																		
Worm tubes, calcareous														2		2		
Coenoclypeus bowersi (colonies)			1							2	2	1	4	4	12	9	12	21
Turf	1	1				1	1	1	1	1	1	1	1	1	1	1	1	1
Balanus sp																		
Metridium senile																		1
filamentous reds Polysiphonia, Neoptilota, Anthothamnion etc																		
Crassadoma gigantea	4		4			3			6									
Sponge, tan encrusting				1			1			1		1		1	1		1	
Sponge, yellow encrusting	1	1	1	1	1	1		1	1	1	1	1	1	1	1			1
Asterina miniata = Patiria																		
Bryozoa, tan branching (colonies)		10																
Balanus nubilus (?)		1		6														
Hydroid, pink															1	1		
Ophiuroid unid																		
Anthopleura xanthogrammica																		
Hydroid, tan branching															1			
Sponge, white encrusting						1												
Urticina																		
Bryozoa, white branching (colonies)						2												1
Sebastes sp																		
Sponge, gray encrusting			1	1														
Sponge, purple encrusting			1															
Strongylocentrotus purpuratus																		
Stylasterias forreri																		
Anemone, unid																		
Bare Metal																		
Dorid, yellow (?Doriopsilla)								1										1
Hermisenda crassicornis																		
Leucilla nuttingi (colonies)										1	1							
Metridium farcimen																		1
Parastichopus californicus														1				
Anemone, pink																		
Anisodoris nobilis																		
Bryozoa turf																		
Dialula sandiegensis																		
Hydroid, tan																		
Oxylebius pictus																		
Styela sp																		

Platform Grace - Leg C1 counts																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	022gr1247	021gr1246	019gr1241	020gr1242	018gr1239	017gr1238	016gr1237	015gr1237	014gr1236	013gr1236	012gr1236	011gr1236	010gr1235	009gr1234	008gr1233	007gr1232	006gr1230	005gr1230
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	172	174	205	205.1	232	238	242	245	248	249	251	256	257	259	271	284	302	307
Corynactis californica, individuals	1																	
Paracalythus stearnsi	201	198	126	97	100	30	79	103	16	38	40	67	32	28	14	20	1	10
Mytilus																		
Ophiothrix spiculata						1	1			1		5						
Balanus spp																		
Anthopleura elegantissima (rosy morph)																		
Mytilus californianus																		
Worm tubes, calcareous			3	1	6	5	6	5	4	3	8	3	4	8	10	10	3	2
Coenoclyathus bowersi (colonies)	7	13	1															
Turf	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Balanus sp																		
Metridium senile																		
filamentous reds Polysiphonia, Neoptilota, Anthamion etc																		
Crassadoma gigantea																		
Sponge, tan encrusting																		
Sponge, yellow encrusting																		
Asterina miniata = Patiria						1	2			2		1	1	1	1			
Bryozoa, tan branching (colonies)																		
Balanus nubilus (?)																		
Hydroid, pink	1	1	1		1		1											
Ophiuroid unid	7																	
Anthopleura xanthogrammica																		
Hydroid, tan branching																		
Sponge, white encrusting	1																	
Urticina																		
Bryozoa, white branching (colonies)																		
Sebastes sp	1	1				1												
Sponge, gray encrusting																		
Sponge, purple encrusting																		
Strongylocentrotus purpuratus																		
Stylasterias forreri									1	1			1					
Anemone, unid																		
Bare Metal																		1
Dorid, yellow (?Doriopsilla)													1					
Hermisenda crassicornis					1							1						
Leucilla nuttingi (colonies)																		
Metridium farcimen		1																
Parastichopus californicus					1													
Anemone, pink																		
Anisodoris nobilis																		
Bryozoa turf																		
Dialula sandiegensis																		
Hydroid, tan																		
Oxylebius pictus	1																	
Styela sp																		

Platform Grace - Leg C1 counts							
DATE	10/23/99						
PHOTO CODE	004gr1229						
LEG	C1			No. of			
DEPTH (ft)	308	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica, individuals		5720	211.8519	73	27	450	1
Paracyathus stearnsi	10	2085	71.89655	73	29	201	1
Mytilus		1357	79.82353	73	17	190	13
Ophiothrix spiculata		987	26.67568	73	37	180	1
Balanus spp		564	26.85714	73	21	68	1
Anthopleura elegantissima (rosy morph)		441	25.94118	73	17	62	1
Mytilus californianus		124	62	73	2	64	60
Worm tubes, calcareous	5	90	4.736842	73	19	10	1
Coenocyathus bowersi (colonies)		89	6.846154	73	13	21	1
Turf	1	64	1	73	64	1	1
Balanus sp		63	31.5	73	2	42	21
Metridium senile		54	10.8	73	5	36	1
filamentous reds Polysiphonia, Neoptilota, Anthamion etc		25	1	73	25	1	1
Crassadoma gigantea		22	4.4	73	5	6	3
Sponge, tan encrusting		20	1	73	20	1	1
Sponge, yellow encrusting		18	1	73	18	1	1
Asterina miniata = Patiria	1	10	1.25	73	8	2	1
Bryozoa, tan branching (colonies)		10	10	73	1	10	10
Balanus nubilus (?)		7	3.5	73	2	6	1
Hydroid, pink		7	1	73	7	1	1
Ophiuroid unid		7	7	73	1	7	7
Anthopleura xanthogrammica		6	3	73	2	4	2
Hydroid, tan branching		4	1	73	4	1	1
Sponge, white encrusting		4	1	73	4	1	1
Urticina		4	2	73	2	2	2
Bryozoa, white branching (colonies)		3	1.5	73	2	2	1
Sebastes sp		3	1	73	3	1	1
Sponge, gray encrusting		3	1	73	3	1	1
Sponge, purple encrusting		3	1	73	3	1	1
Strongylocentrotus purpuratus		3	1.5	73	2	2	1
Stylasterias forreri		3	1	73	3	1	1
Anemone, unid		2	2	73	1	2	2
Bare Metal		2	1	73	2	1	1
Dorid, yellow (?Doriopsilla)		2	1	73	2	1	1
Hermisenda crassicornis		2	1	73	2	1	1
Leucilla nuttingi (colonies)		2	1	73	2	1	1
Metridium farcimen		2	1	73	2	1	1
Parastichopus californicus		2	1	73	2	1	1
Anemone, pink		1	1	73	1	1	1
Anisodoris nobilis		1	1	73	1	1	1
Bryozoa turf		1	1	73	1	1	1
Dialula sandiegensis		1	1	73	1	1	1
Hydroid, tan		1	1	73	1	1	1
Oxylebius pictus		1	1	73	1	1	1
Styela sp		1	1	73	1	1	1

Platform Grace - Leg C1 %																		
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99
PHOTO CODE	026grD	027grD	024grD	025grD	028grD	022grD	023grD	020grD	021grD	029grD	017grD	018grD	019grD	016grD	015grD	014grD	013grD	012grD
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	3	3.1	4	4.1	4.2	5	5.1	6	6.1	6.2	7	7.1	7.2	8	8.1	10	15	16
Mytilus	35	50	50	55	60	35	50	50	50	80		70	55		50	45	55	40
Corynactis californica (%)																		
Turf (%)	50		25	40	10	15	10	40	20	10				1	15		5	5
Anthopleura elegantissima (rosy morph) %														0.5	1	5	25	25
Hydroid, tan %																25		
filamentous reds Polysiphonia, Neoptilota,		40	20		10	50	40	10	20		25	10	15	25	25	25	20	25
Bryozoa turf %												20						
Sponge, gray encrusting %																		
Hydroid, tan branching %											15		30	15				
Sponge, yellow encrusting (%)																		
Sponge, tan encrusting (%)																	5	5
Bare Metal (%)																		
Sponge, purple encrusting %																		
Metridium senile %	12	1		4											1			
Sponge, white encrusting (%)							0.5		0.5									
Hydroid, pink %																		
Encruster - blue (%)																		
Foliose red algae %																		
Encruster - white (%)																		
Encruster - pink (%)																		
Line (%)																		
Obelia sp %						1												
Polyclinum planum %																		
Sponge, orange encrusting %																		
Tunicate, encrusting tan %											1							
Encruster - yellow %																		
Hydroid, white clump %	0.5	0.1	1	1														

Platform Grace - Leg C1 %																		
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/23/99	10/24/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	010grD	011grD	009grD	008grD	007grD	006grD	005grD	004grD	003grD	065gr1322	002grD	064gr1321	062gr1319	060gr1318	059gr1318	057gr1317	055gr1315	054gr1314
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	19	19.1	22	24	25	28	30	31	34	35	35.1	38	52	55	58	61	65	70
Mytilus	5																	
Corynactis californica (%)							25			5		60	25	80	40	60	85	95
Turf (%)	20	10	50	60	70	10	20	10	10	30	5	15			40	5	10	2
Anthopleura elegantissima (rosy morph) %	15	50	15	15	15	30	40	75	60		90							
Hydroid, tan %																		
filamentous reds Polysiphonia, Neoptilota, Bryozoa turf %	40	40	25	15	15	10	5		10		0.5						10	
Sponge, gray encrusting %												10						
Hydroid, tan branching %																		
Sponge, yellow encrusting (%)														15	1	5	1	
Sponge, tan encrusting (%)	20		10	5		50	2	10	10		3		30	2		5		
Bare Metal (%)																		
Sponge, purple encrusting %								5	10									
Metridium senile %																		
Sponge, white encrusting (%)																		
Hydroid, pink %																		
Encruster - blue (%)																		
Foliose red algae %							1				0.5							
Encruster - white (%)																		
Encruster - pink (%)																		
Line (%)																		
Obelia sp %																		
Polyclinum planum %								1										
Sponge, orange encrusting %																		
Tunicate, encrusting tan %																		
Encruster - yellow %																		
Hydroid, white clump %																		

Platform Grace - Leg C1 %																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	051gr1312	050gr1312	047gr1309	043gr1306	037gr1303	035gr1302	036gr1302	034gr1301	032gr1258	031gr1256	030gr1255	029gr1254	028gr1253	027gr1252	026gr1251	025gr1251	024gr1250	023gr1249
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	73	77	81	84	87	88	88.1	93	111	119	126	131	136	144	148	150	153	159
Mytilus																		
Corynactis californica (%)	75	75	50	50	85	50	85	40	30	35	30	20	25	20	2	2	1	
Turf (%)	15	10			4	20	15	15	5	5	5	10	5	10	10	30	20	20
Anthopleura elegantissima (rosy morph) %																		
Hydroid, tan %																		
filamentous reds Polysiphonia, Neoptilota, Bryozoa turf %																		
Sponge, gray encrusting %			15	25														
Hydroid, tan branching %															2			
Sponge, yellow encrusting (%)	5	15	15	3	15	15		15	20	15	30	10	20	2	1			
Sponge, tan encrusting (%)				1				2		5		5		5	15		5	
Bare Metal (%)																		
Sponge, purple encrusting %			1															
Metridium senile %																	0.5	
Sponge, white encrusting (%)							1											
Hydroid, pink %															0.5	1		
Encruster - blue (%)																		
Foliose red algae %					2													
Encruster - white (%)	1			2									0.5					
Encruster - pink (%)																		
Line (%)								1										
Obelia sp %																		
Polyclinum planum %																		
Sponge, orange encrusting %			1															
Tunicate, encrusting tan %																		
Encruster - yellow %							2									0.5	0.5	
Hydroid, white clump %																		

Platform Grace - Leg C1 %																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	022gr1247	021gr1246	019gr1241	020gr1242	018gr1239	017gr1238	016gr1237	015gr1237	014gr1236	013gr1236	012gr1236	011gr1236	010gr1235	009gr1234	008gr1233	007gr1232	006gr1230	005gr1230
LEG	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1	C1
DEPTH (ft)	172	174	205	205.1	232	238	242	245	248	249	251	256	257	259	271	284	302	307
Mytilus																		
Corynactis californica (%)	0.5																	
Turf (%)	30	50	75	97	90	80	85	90	85	85	90	95	90	90	90	90	90	90
Anthopleura elegantissima (rosy morph) %																		
Hydroid, tan %																		
filamentous reds Polysiphonia, Neoptilota,																		
Bryozoa turf %																		
Sponge, gray encrusting %																		
Hydroid, tan branching %																		
Sponge, yellow encrusting (%)																		
Sponge, tan encrusting (%)																		
Bare Metal (%)														5				10
Sponge, purple encrusting %																		
Metridium senile %																		
Sponge, white encrusting (%)	10																	
Hydroid, pink %	2	1	5		1		1											
Encruster - blue (%)				2								1						
Foliose red algae %																		
Encruster - white (%)																		0.5
Encruster - pink (%)				1														
Line (%)																		
Obelia sp %																		
Polyclinum planum %																		
Sponge, orange encrusting %																		
Tunicate, encrusting tan %																		
Encruster - yellow %	0.5		0.5				1	1			0.5							
Hydroid, white clump %																		

Platform Grace - Leg C1 %							
DATE	10/23/99						
PHOTO CODE	004gr1229						
LEG	C1			No. of			
DEPTH (ft)	308	Total	Average	Photos	Occurrence	Max	Min
Mytilus		835	49.11765	73	17	80	5
Corynactis californica (%)		1150.5	42.61111	73	27	95	0.5
Turf (%)	90	2394	37.40625	73	64	97	1
Anthopleura elegantissima (rosy morph) %		461.5	30.76667	73	15	90	0.5
Hydroid, tan %		25	25	73	1	25	25
filamentous reds Polysiphonia, Neoptilota,		530.5	21.22	73	25	50	0.5
Bryozoa turf %		20	20	73	1	20	20
Sponge, gray encrusting %		50	16.66667	73	3	25	10
Hydroid, tan branching %		62	15.5	73	4	30	2
Sponge, yellow encrusting (%)		203	11.27778	73	18	30	1
Sponge, tan encrusting (%)		195	9.75	73	20	50	1
Bare Metal (%)		15	7.5	73	2	10	5
Sponge, purple encrusting %		16	5.333333	73	3	10	1
Metridium senile %		18.5	3.7	73	5	12	0.5
Sponge, white encrusting (%)		12	3	73	4	10	0.5
Hydroid, pink %		11.5	1.642857	73	7	5	0.5
Encruster - blue (%)		3	1.5	73	2	2	1
Foliose red algae %		3.5	1.166667	73	3	2	0.5
Encruster - white (%)		4	1	73	4	2	0.5
Encruster - pink (%)		1	1	73	1	1	1
Line (%)		1	1	73	1	1	1
Obelia sp %		1	1	73	1	1	1
Polyclinum planum %		1	1	73	1	1	1
Sponge, orange encrusting %		1	1	73	1	1	1
Tunicate, encrusting tan %		1	1	73	1	1	1
Encruster - yellow %		6.5	0.8125	73	8	2	0.5
Hydroid, white clump %		2.6	0.65	73	4	1	0.1

Platform Grace - Leg C4 counts																
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99
PHOTO CODE	029grD	030grD	031grD	026grD	027grD	028grD	023grD	024grD	025grD	021grD	022grD	032grD	033grD	019grD	020grD	018grD
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	3	3.1	3.2	4	4.1	4.2	5	5.1	5.2	6	6.1	6.2	6.3	8	8.1	9
Corynactis californica, individuals																
Mytilus		240	75	80	120	100	110	170	110	74	50	120	75	48	58	56
Metridium senile	15	2			16	9	5	8		2		23		1	3	
Ophiothrix spiculata										6	4			50	40	11
Balanus sp				55	56	24	40	55	48	18	13			6	11	18
Paracyathus stearnsi																
Balanus spp		57	100									14	4			
Anthopleura elegantissima (rosy morph)	12									4		5	10	14	14	3
Metridium exilis?																
Metridium farcimen																
Turf		1	1	1			1	1	1	1	1			1	1	1
Balanus nubilus (?)																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc				1	1	1	1	1	1	1	1	1	1	1	1	1
Crassadoma gigantea																
Ulva lactuca		15	5	2												
Bryozoa, tan branching (colonies)																
Ophiroid unid																
Hydroid, tan					1	1			1		1	1	1			
Coenocyathus bowersi (colonies)																
Zoanthid, colonial tan																
Strongylocentrotus purpuratus						1				2						1
Bare Metal			1	1												
Leucetta																
Sebastes sp																
Sponge, tan encrusting																
Cliona, yellow																
Aeolid unid																
Anthozoa, unid																
Hermisenda crassicornis																
Hydroid, tan branching																
Sponge, white encrusting																
Stylasterias foreri																
Worm tubes, calcareous																

Platform Grace - Leg C4 counts																		
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/23/99	10/23/99	10/24/99	10/24/99
PHOTO CODE	017grD	016grD	015grD	014grD	013grD	012grD	011grD	010grD	009grD	008grD	006grD	007grD	005grD	004grD	130gr1555	129gr1554	002grD	003grD
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	10	11	12	13	14	26	28	29	33	35	39	39.1	40	42	47	49	49.1	49.2
Corynactis californica, individuals											10							
Mytilus	66	55	75	50	65				4	5	13	5						
Metridium senile							10	20	75	50	35	70	80	70	74	84	63	80
Ophiothrix spiculata	50	50	50	30	20	60	180	70	7	70	60	60	32	50	110	80	37	70
Balanus sp	5	2																
Paracyathus stearnsi																		
Balanus spp			6	6	5	4		1										
Anthopleura elegantissima (rosy morph)		23	14	18	16	26	30	2										
Metridium exilis?																		
Metridium farcimen																		
Turf	1	1	1		1	1	1				1		1	1			1	1
Balanus nubilus (?)																1		
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc	1	1	1	1	1	1			1		1	1	1					1
Crassadoma gigantea																		
Ulva lactuca																		
Bryozoa, tan branching (colonies)																		
Ophiroid unid																		
Hydroid, tan								1	1	1	1			1				
Coenocyathus bowersi (colonies)																		
Zoanthid, colonial tan																		
Strongylocentrotus purpuratus	2																	
Bare Metal																		
Leucetta								1		1	1		1				1	
Sebastes sp																		
Sponge, tan encrusting																		
Cliona, yellow							1				1							
Aeolid unid																		
Anthozoa, unid																		
Hermisenda crassicornis																		
Hydroid, tan branching																		
Sponge, white encrusting																		
Stylasterias foreri																		
Worm tubes, calcareous																		

Platform Grace - Leg C4 counts																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	128gr1553	126gr1551	123gr1550	122gr1549	121gr1548	120gr1547	119gr1547	118gr1546	117gr1546	115gr1545	111gr1543	109gr1542	105gr1540	101gr1537	100gr1536	098gr1533	097gr1532	096gr1530
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	52	57	61	67	69	72	74	76	79	81	83	85	87	88	99	106	123	130
Corynactis californica, individuals		50	310	390	500	250	55	495	490	500	480	485	470	475	485	495	485	400
Mytilus																		
Metridium senile	80	57	22															
Ophiothrix spiculata	120	60	20	30		60	15						3		2			
Balanus sp																		
Paracyathus stearnsi																		
Balanus spp																		
Anthopleura elegantissima (rosy morph)																		
Metridium exilis?				15		22	60											
Metridium farcimen																		1
Turf			1									1						
Balanus nubilus (?)			1					2	2	2	3	4	3	3	3	2	8	4
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																		
Crassadoma gigantea					2			6	3	2	1	2	2		2	1		
Ulva lactuca																		
Bryozoa, tan branching (colonies)				15														
Ophiroid unid																		
Hydroid, tan																		
Coenocyathus bowersi (colonies)																		
Zoanthid, colonial tan																		
Strongylocentrotus purpuratus																		
Bare Metal																		
Leucetta																		
Sebastes sp																		1
Sponge, tan encrusting							1											
Cliona, yellow																		
Aeolid unid																		
Anthozoa, unid																		
Hermisenda crassicornis																		
Hydroid, tan branching																		
Sponge, white encrusting																		
Stylasterias foreri																		
Worm tubes, calcareous															1			

Platform Grace - Leg C4 counts																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	095gr1530	092gr1527	091gr1526	090gr1526	089gr1523	088gr1521	087gr1521	086gr1520	085gr1519	084gr1516	083gr1516	082gr1514	081gr1514	079gr1514	080gr1514	078gr1513	077gr1512	076gr1512
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	133	146	148	150	165	191	193	197	202	250	255	264	265	266	266.1	271	277	278
Corynactis californica, individuals	365	385	180	150		12												
Mytilus																		
Metridium senile										101	20	42	65	41	45	25	11	28
Ophiothrix spiculata	33	8																
Balanus sp																		
Paracyathus stearnsi	1	19	10	48	57	10	21	48										
Balanus spp																		
Anthopleura elegantissima (rosy morph)																		
Metridium exilis?																		
Metridium farcimen		1	8	1	8	18	14		2		4					2	12	
Turf	1	1	1	1	1	1	1	1	1	1		1		1	1	1		1
Balanus nubilus (?)	1																	
filamentous reds Polysiphonia, Neoptilota, Antithamion etc																		
Crassadoma gigantea		1																
Ulva lactuca																		
Bryozoa, tan branching (colonies)																		
Ophiroid unid				10		1					1							1
Hydroid, tan																		
Coenoclyathus bowersi (colonies)	2				5			1										
Zoanthid, colonial tan								1			1						1	1
Strongylocentrotus purpuratus																		
Bare Metal												1					1	
Leucetta																		
Sebastes sp											1							1
Sponge, tan encrusting	1				1					1								
Cliona, yellow																		
Aeolid unid													1					
Anthozoa, unid									1									
Hermisenda crassicornis	1																	
Hydroid, tan branching	1																	
Sponge, white encrusting		1																
Stylasterias foreri																		
Worm tubes, calcareous																		

Platform Grace - Leg C4 counts													
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99						
PHOTO CODE	075gr1512	074gr1510	073gr1509	072gr1508	071gr1507	070gr1507	069gr1506						
LEG	C4	C4	C4	C4	C4	C4	C4			No. of			
DEPTH (ft)	279	285	290	291	299	304	310	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica, individuals								7917	344.2174	77	23	500	10
Mytilus								1824	76	77	24	240	4
Metridium senile	9	12	75	60	66	50	165	1769	43.14634	77	41	165	1
Ophiothrix spiculata								1548	46.90909	77	33	180	2
Balanus sp								351	27	77	13	56	2
Paracyathus stearnsi								214	26.75	77	8	57	1
Balanus spp								197	21.88889	77	9	100	1
Anthopleura elegantissima (rosy morph)								191	13.64286	77	14	30	2
Metridium exilis?								97	32.33333	77	3	60	15
Metridium farcimen								71	6.454545	77	11	18	1
Turf	1	1	1	1	1	1	1	46	1	77	46	1	1
Balanus nubilus (?)								39	2.785714	77	14	8	1
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc								24	1	77	24	1	1
Crassadoma gigantea								22	2.2	77	10	6	1
Ulva lactuca								22	7.333333	77	3	15	2
Bryozoa, tan branching (colonies)								15	15	77	1	15	15
Ophiroid unid	2							15	3	77	5	10	1
Hydroid, tan								11	1	77	11	1	1
Coenocyathus bowersi (colonies)								8	2.666667	77	3	5	1
Zoanthid, colonial tan	1	1			1			7	1	77	7	1	1
Strongylocentrotus purpuratus								6	1.5	77	4	2	1
Bare Metal								5	1	77	5	1	1
Leucetta								5	1	77	5	1	1
Sebastes sp						1		4	1	77	4	1	1
Sponge, tan encrusting								4	1	77	4	1	1
Cliona, yellow								2	1	77	2	1	1
Aeolid unid								1	1	77	1	1	1
Anthozoa, unid								1	1	77	1	1	1
Hermisenda crassicornis								1	1	77	1	1	1
Hydroid, tan branching								1	1	77	1	1	1
Sponge, white encrusting								1	1	77	1	1	1
Stylasterias foreri							1	1	1	77	1	1	1
Worm tubes, calcareous								1	1	77	1	1	1

Platform Grace - Leg C4 %																
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99
PHOTO CODE	029grD	030grD	031grD	026grD	027grD	028grD	023grD	024grD	025grD	021grD	022grD	032grD	033grD	019grD	020grD	018grD
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	3	3.1	3.2	4	4.1	4.2	5	5.1	5.2	6	6.1	6.2	6.3	8	8.1	9
Corynactis californica (%)																
Mytilus		85	80	65	65	68	83	78	69	77	60	50	55	39	39	85
Zoanthid, colonial tan %																
Metridium senile %	5	0.5			5	7	1	2		1		10		1	1	
Turf (%)		5	15	15			5	5	1	10	5			20	30	10
Hydroid, tan %					15	15			5		20	20	20			
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc %				20	15	10	10	15	25	10	15	15	20	30	20	2
Cioma, yellow %																
Anthozoa, unid (%)																
Anthopleura elegantissima (rosy morph) %	5									2		2	5	10	10	1
Bare Metal (%)			5	2												
Sponge, tan encrusting (%)																
Leucetta %																
Sponge, yellow encrusting (%)																
Foliose red algae %																
Sponge, yellow erect (%)																
Encruster - yellow %																
Sponge, cup tan %																
Encruster - white (%)																
Hydroid, tan branching %																
Sponge, white encrusting (%)																
Sponge, tan foliose (%)																
Encruster - blue (%)																
Encruster - pink (%)																

Platform Grace - Leg C4 %																		
DATE	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/24/99	10/23/99	10/23/99	10/24/99	10/24/99
PHOTO CODE	017grD	016grD	015grD	014grD	013grD	012grD	011grD	010grD	009grD	008grD	006grD	007grD	005grD	004grD	130gr1555	129gr1554	002grD	003grD
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	10	11	12	13	14	26	28	29	33	35	39	39.1	40	42	47	49	49.1	49.2
Corynactis californica (%)											2							
Mytilus	75	35	40	30	55				5	5	10	10						
Zoanthid, colonial tan %																		
Metridium senile %							10	20	75	50	35	70	80	70	80	80	35	80
Turf (%)	5	20	20		15	50	20				10		1	1			10	5
Hydroid, tan %								60	15	10	10			10				
filamentous reds Polysiphonia, Neoptilota, Anthamnon etc %	20	50	30	50	20	10			5		1	3	2					3
Cioma, yellow %							10				10							
Anthozoa, unid (%)																		
Anthopleura elegantissima (rosy morph) %		15	10	20	10	15	15	2										
Bare Metal (%)																		
Sponge, tan encrusting (%)																		
Leucetta %								20		3	1		5					2
Sponge, yellow encrusting (%)																		
Foliose red algae %													1					5
Sponge, yellow erect (%)																		
Encruster - yellow %																		
Sponge, cup tan %																		
Encruster - white (%)																		
Hydroid, tan branching %																		
Sponge, white encrusting (%)																		
Sponge, tan foliose (%)																		
Encruster - blue (%)																		
Encruster - pink (%)																		

Platform Grace - Leg C4 %																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	128gr1553	126gr1551	123gr1550	122gr1549	121gr1548	120gr1547	119gr1547	118gr1546	117gr1546	115gr1545	111gr1543	109gr1542	105gr1540	101gr1537	100gr1536	098gr1533	097gr1532	096gr1530
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	52	57	61	67	69	72	74	76	79	81	83	85	87	88	99	106	123	130
Corynactis californica (%)		10	60	75	100	50	10	99	99	99	98	98	95	95	98	99	98	85
Mytilus																		
Zoanthid, colonial tan %																		
Metridium senile %	75	65	10															
Turf (%)			20									2						
Hydroid, tan %																		
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc %																		
Ciona, yellow %																		
Anthozoa, unid (%)																		
Anthopleura elegantissima (rosy morph) %																		
Bare Metal (%)																		
Sponge, tan encrusting (%)						5	10											
Leucetta %																		
Sponge, yellow encrusting (%)				5			10	1		0.5			5	5	2	1	1	2
Foliose red algae %																		
Sponge, yellow erect (%)																		
Encruster - yellow %																		
Sponge, cup tan %																	1	2
Encruster - white (%)							0.5	1		2								
Hydroid, tan branching %																		
Sponge, white encrusting (%)																		
Sponge, tan foliose (%)																		
Encruster - blue (%)																		
Encruster - pink (%)																		

Platform Grace - Leg C4 %																		
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99
PHOTO CODE	095gr1530	092gr1527	091gr1526	090gr1526	089gr1523	088gr1521	087gr1521	086gr1520	085gr1519	084gr1516	083gr1516	082gr1514	081gr1514	079gr1514	080gr1514	078gr1513	077gr1512	076gr1512
LEG	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4	C4
DEPTH (ft)	133	146	148	150	165	191	193	197	202	250	255	264	265	266	266.1	271	277	278
Corynactis californica (%)	70	80	33	30		8												
Mytilus																		
Zoanthid, colonial tan %								75		25							3	30
Metridium senile %									50	25	50	65	41	45	25	11	28	
Turf (%)	5	10	10	20	10	15	25	25	90	50		50		66	66	75		66
Hydroid, tan %																		
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc %																		
Ciona, yellow %																		
Anthozoa, unid (%)									10									
Anthopleura elegantissima (rosy morph) %																		
Bare Metal (%)											10						15	
Sponge, tan encrusting (%)	10				7					1								
Leucetta %																		
Sponge, yellow encrusting (%)	10						0.5	3										
Foliose red algae %																		
Sponge, yellow erect (%)									2									
Encruster - yellow %								3										
Sponge, cup tan %																		
Encruster - white (%)																		
Hydroid, tan branching %	1																	
Sponge, white encrusting (%)		1																
Sponge, tan foliose (%)							0.5											
Encruster - blue (%)									0.1									
Encruster - pink (%)								0.1										

Platform Grace - Leg C4 %													
DATE	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99	10/23/99						
PHOTO CODE	075gr1512	074gr1510	073gr1509	072gr1508	071gr1507	070gr1507	069gr1506						
LEG	C4	C4	C4	C4	C4	C4	C4			No. of			
DEPTH (ft)	279	285	290	291	299	304	310	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica (%)								1591	69.17391	77	23	100	2
Mytilus								1263	52.625	77	24	85	5
Zoanthid, colonial tan %	90	35			5			263	37.57143	77	7	90	3
Metridium senile %	9	12	75	60	66	50	20	1500.5	36.59756	77	41	80	0.5
Turf (%)	10	60	25	40	30	50	80	1178	25.6087	77	46	90	1
Hydroid, tan %								200	18.18182	77	11	60	5
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc %								401	16.70833	77	24	50	1
Cioma, yellow %								20	10	77	2	10	10
Anthozoa, unid (%)								10	10	77	1	10	10
Anthopleura elegantissima (rosy morph) %								122	8.714286	77	14	20	1
Bare Metal (%)							10	42	8.4	77	5	15	2
Sponge, tan encrusting (%)								33	6.6	77	5	10	1
Leucetta %								31	6.2	77	5	20	1
Sponge, yellow encrusting (%)								46	3.538462	77	13	10	0.5
Foliose red algae %								6	3	77	2	5	1
Sponge, yellow erect (%)								2	2	77	1	2	2
Encruster - yellow %				0.5				3.5	1.75	77	2	3	0.5
Sponge, cup tan %								3	1.5	77	2	2	1
Encruster - white (%)								3.5	1.166667	77	3	2	0.5
Hydroid, tan branching %								1	1	77	1	1	1
Sponge, white encrusting (%)								1	1	77	1	1	1
Sponge, tan foliose (%)								0.5	0.5	77	1	0.5	0.5
Encruster - blue (%)								0.1	0.1	77	1	0.1	0.1
Encruster - pink (%)								0.1	0.1	77	1	0.1	0.1

Platform Harvest - Leg B1 counts																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	029haD	028haD	027haD	026haD	023haD	025haD	024haD	022haD	021haD	020haD	019haD	018haD	017haD	016haD	015haD	014haD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	3	4	5	6	6.1	6.2	7	10	12	14	16	18	22	24	26	28
Metridium senile	4	2	5	5	1	2		2			2		2			40
Ophiuroid unid																
Mytilus	50	55	46	55	54	63	75	45	45	42	47	40	38	27	15	12
Corynactis californica, individuals																
Leucetta		2							5							
Balanus sp	6	8	9	13	9	6	9	15	4	18	5	12	11		2	1
Anthopleura elegantissima (rosy morph)	16	3	5	4	3	13	18	9	24	4	4	12	1	6	1	
Worm tubes, calcareous																
Turf	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tunicate, encrusting translucent																
Bare Metal																
Encruster, red																
Balanus nubilus																
Barnacle, unid																
Foliose red algae		1	1	1	1	1		1		1	1	1	1	1	1	1
Metridium farcimen																
Zoanthid, solitary tan																
Encruster - tan																
Encruster - yellow																
Encruster, pink																
Galathea californiensis																
Worm tubes, plain																
Bivalve, nestling																
Leucetta losangelensis																
Encruster, green				1												
Pollicipes polymerus									7							
Plumularia sp				1	1											
Sebastes sp																
Bryozoa, white branching (colonies) (count)																
Bryozoa, tan branching (colonies)																
Encruster, lavender																
Sponge, yellow encrusting											1					
Metridium sp																
Sponge, tan encrusting																
Aeolidia papillosa?																
Botrylloides sp.																
Crassadoma gigantea																
Egria													1			
Encruster - white														1		
Hermisenda crassicornis																
Leucilla nuttingi (colonies)																
Pisaster ochraceus															1	
Spionidae		1														
Stylasterias forreri																
Zoanthid, colonial tan																

Platform Harvest - Leg B1 counts																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	013haD	012haD	011haD	010haD	009haD	008haD	007haD	006haD	005haD	004haD	003haD	002haD	001haD	065ha1241	064ha1241	063ha1240
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	29	31	33	35	37	41	46	48	51	58	65	68	72	98	102	103
Metridium senile			40	75	50	80	75	90	90	90	15	68	90	90		5
Ophiuroid unid	3	1			1	4		62	12	34	60	33	18	5	8	75
Mytilus	17		1	4			3									
Corynactis californica, individuals															360	240
Leucetta		5	15	20	15	5		5	5		30	5	10	10	10	25
Balanus sp	3	6	4				1									
Anthopleura elegantissima (rosy morph)											1					
Worm tubes, calcareous																
Turf	1	1	1	1	1	1		1	1		1	1				
Tunicate, encrusting translucent																
Bare Metal																
Encruster, red																
Balanus nubilus				2	1	1		2	3	3	5	7	1	3	3	
Barnacle, unid																8
Foliose red algae	1	1	1	1	1	1	1			1	1					
Metridium farcimen	3	4														
Zoanthid, solitary tan																
Encruster - tan										1	1					
Encruster - yellow																
Encruster, pink											1					
Galathea californiensis																
Worm tubes, plain																
Bivalve, nestling		2		3				1		1	1	1				
Leucetta losangelensis								1	1				1			
Encruster, green		1			1	1					1	1				
Pollicipes polymerus																
Plumularia sp																
Sebastes sp																
Bryozoa, white branching (colonies) (count)			1													
Bryozoa, tan branching (colonies)																
Encruster, lavender																
Sponge, yellow encrusting						1	1									
Metridium sp																
Sponge, tan encrusting							1									
Aeolidia papillosa?																
Botrylloides sp.											1					
Crassadoma gigantea																
Egorgia																
Encruster - white																
Hermisenda crassicornis																
Leucilla nuttingi (colonies)																
Pisaster ochraceus																
Spionidae																
Stylasterias forreri																
Zoanthid, colonial tan																

Platform Harvest - Leg B1 counts																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	062ha1240	061ha1240	060ha1239	057ha1231	058ha1233	059ha1234	056ha1230	055ha1230	054ha1228	053ha1227	051ha1225	052ha1226	050ha1225	049ha1224	047ha1222	048ha1223
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	108	110	120	124	125	126	135	137	144	149	154	157	158	176	185	185.1
Metridium senile	80	80	25	70	76	50	60	30	25	70	50	70	50	20	25	45
Ophiuroid unid	100	29	120	35	30	50	2									
Mytilus																
Corynactis californica, individuals			60			12										
Leucetta	20	20	35	5	12	40	7	15	6				2			
Balanus sp				2			5	4	4	2	6	4		2	9	3
Anthopleura elegantissima (rosy morph)																
Worm tubes, calcareous									3		2			4	2	1
Turf							1	1	1	1	1	1	1	1	1	1
Tunicate, encrusting translucent																
Bare Metal					1			1		1	1	1		1	1	1
Encruster, red							1	1	1					1	1	1
Balanus nubilus																
Barnacle, unid		2	7			4							4			
Foliose red algae																
Metridium farcimen																
Zoanthid, solitary tan																
Encruster - tan			1			1	1	1			1			1		
Encruster - yellow									1	1	1					
Encruster, pink									1	1	1		1	1	1	1
Galathea californiensis																
Worm tubes, plain																
Bivalve, nestling																
Leucetta losangelensis				1	1		1		1							
Encruster, green																
Pollicipes polymerus																
Plumularia sp		1				1										
Sebastes sp																
Bryozoa, white branching (colonies) (count)							1	1								
Bryozoa, tan branching (colonies)									1							
Encruster, lavender																
Sponge, yellow encrusting																
Metridium sp																
Sponge, tan encrusting																
Aeolidia papillosa?																
Botrylloides sp.																
Crassadoma gigantea						1										
Egria																
Encruster - white																
Hermisenda crassicornis																
Leucilla nuttingi (colonies)									1							
Pisaster ochraceus																
Spionidae																
Stylasterias forreri																
Zoanthid, colonial tan																

Platform Harvest - Leg B1 counts																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	046ha1221	045ha1221	044ha1220	043ha1219	042ha1218	041ha1217	040ha1216	039ha1215	038ha1214	037ha1213	036ha1212	035ha1211	034ha1210	033ha1208	032ha1207	031ha1206
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	199	209	225	238	243	260	278	288	292	301	314	329	335	366	370	372
Metridium senile	30	30	25	20	30	25	20	25	30	12	15	30	25	25	25	25
Ophiroid unid			8	5	3	16	13	3	12	16	11	1	5		4	
Mytilus																
Corynactis californica, individuals																
Leucetta			17						8							
Balanus sp		1	3								1					
Anthopleura elegantissima (rosy morph)																
Worm tubes, calcareous	2		4	3	3		5	4			7	6	1	2	3	8
Turf	1	1			1			1	1	1		1	1	1	1	1
Tunicate, encrusting translucent											15			2	10	
Bare Metal	1	1	1			1	1	1	1		1	1	1	1	1	1
Encruster, red	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1
Balanus nubilus																
Barnacle, unid																
Foliose red algae																
Metridium farcimen																
Zoanthid, solitary tan													16			
Encruster - tan	1			1	1									1	1	
Encruster - yellow		1				1	1		1	1	1	1	1			1
Encruster, pink	1	1	1	1	1			1								
Galathea californiensis																
Worm tubes, plain																
Bivalve, nestling																
Leucetta losangelensis			1						1							
Encruster, green	1															
Pollicipes polymerus																
Plumularia sp																
Sebastes sp																
Bryozoa, white branching (colonies) (count)																
Bryozoa, tan branching (colonies)												1				
Encruster, lavender							1			1						
Sponge, yellow encrusting																
Metridium sp																
Sponge, tan encrusting																
Aeolidia papillosa?																
Botrylloides sp.																
Crassadoma gigantea																
Egria																
Encruster - white						1										
Hermisenda crassicornis																
Leucilla nuttingi (colonies)																
Pisaster ochraceus																
Spionidae																
Stylasterias forreri																
Zoanthid, colonial tan													1			

Platform Harvest - Leg B1 counts																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	030ha1205	029ha1204	028ha1203	027ha1203	026ha1157	025ha1157	024ha1156	023ha1154	022ha1153	021ha1151	019ha1147	020ha1148	018ha1144	017ha1142	016ha1141	015ha1140
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	395	399	402	409	418	425	432	455	481	504	519	519.1	533	569	581	585
Metridium senile	30	50	30	40	25	10	25	25	20	10	60	50	70	30	50	50
Ophiuroid unid								2								
Mytilus																
Corynactis californica, individuals																
Leucetta																
Balanus sp																
Anthopleura elegantissima (rosy morph)																
Worm tubes, calcareous	2	2	7		9	11	2	1		3	1					2
Turf	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1
Tunicate, encrusting translucent	15											1			5	
Bare Metal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Encruster, red	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Balanus nubilus																
Barnacle, unid																
Foliose red algae																
Metridium farcimen																
Zoanthid, solitary tan																
Encruster - tan																
Encruster - yellow	1															
Encruster, pink																
Galathea californiensis													1		1	1
Worm tubes, plain							1	6		2						
Bivalve, nestling																
Leucetta losangelensis																
Encruster, green																
Pollicipes polymerus																
Plumularia sp																
Sebastes sp					1				1				1			
Bryozoa, white branching (colonies) (count)			0.5													
Bryozoa, tan branching (colonies)						1										
Encruster, lavender													1			
Sponge, yellow encrusting																
Metridium sp																
Sponge, tan encrusting																
Aeolidia papillosa?																
Botrylloides sp.																
Crassadoma gigantea																
Egorgia																
Encruster - white																
Hermisenda crassicornis																
Leucilla nuttingi (colonies)																
Pisaster ochraceus																
Spionidae																
Stylasterias forreri																
Zoanthid, colonial tan																

Platform Harvest - Leg B1 counts																	
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99				
PHOTO CODE	014ha1139	013ha1139	012ha1138	011ha1137	010ha1136	009ha1135	008ha1134	007ha1133	006ha1132	005ha1131	004ha1130	003ha1129					
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1					
DEPTH (ft)	597	601	614	618	625	635	641	647	650	659	664	669	Total	Average	No. of	Occurrence	
Metridium senile	40	50	60	30	30	30	75	50	50		2	25	3168	38.63415	92	82	
Ophiroid unid					1								782	23	92	34	
Mytilus													734	36.7	92	20	
Corynactis californica, individuals													672	168	92	4	
Leucetta													354	13.11111	92	27	
Balanus sp													188	5.875	92	32	
Anthopleura elegantissima (rosy morph)													124	7.75	92	16	
Worm tubes, calcareous	2		2	1									105	3.5	92	30	
Turf	1	1	1	1	1	1	1	1			1	1	72	1	92	72	
Tunicate, encrusting translucent					2								50	7.142857	92	7	
Bare Metal	1	1	1	1	1	1	1	1	1		1	1	48	1	92	48	
Encruster, red	1	1	1	1	1	1	1	1	1		1	1	48	1	92	48	
Balanus nubilus													31	2.818182	92	11	
Barnacle, unid													25	5	92	5	
Foliose red algae													22	1	92	22	
Metridium farcimen										8	3	4	22	4.4	92	5	
Zoanthid, solitary tan													16	16	92	1	
Encruster - tan													13	1	92	13	
Encruster - yellow													13	1	92	13	
Encruster, pink													13	1	92	13	
Galathea californiensis	2						1	1	4				11	1.571429	92	7	
Worm tubes, plain											1	1	11	2.2	92	5	
Bivalve, nestling													9	1.5	92	6	
Leucetta losangelensis													9	1	92	9	
Encruster, green													7	1	92	7	
Pollicipes polymerus													7	7	92	1	
Plumularia sp													4	1	92	4	
Sebastes sp	1												4	1	92	4	
Bryozoa, white branching (colonies) (count)													3.5	0.875	92	4	
Bryozoa, tan branching (colonies)													3	1	92	3	
Encruster, lavender													3	1	92	3	
Sponge, yellow encrusting													3	1	92	3	
Metridium sp												2	2	2	92	1	
Sponge, tan encrusting									1				2	1	92	2	
Aeolidia papillosa?						1							1	1	92	1	
Botrylloides sp.													1	1	92	1	
Crassadoma gigantea													1	1	92	1	
Egorgia													1	1	92	1	
Encruster - white													1	1	92	1	
Hermisenda crassicornis													1	1	92	1	
Leucilla nuttingi (colonies)													1	1	92	1	
Pisaster ochraceus													1	1	92	1	
Spionidae													1	1	92	1	
Stylasterias forreri												1	1	1	92	1	
Zoanthid, colonial tan													1	1	92	1	

Platform Harvest - Leg B1 counts		
DATE		
PHOTO CODE		
LEG		
DEPTH (ft)	Max	Min
Metridium senile	90	1
Ophiuroid unid	120	1
Mytilus	75	1
Corynactis californica, individuals	360	12
Leucetta	40	2
Balanus sp	18	1
Anthopleura elegantissima (rosy morph)	24	1
Worm tubes, calcareous	11	1
Turf	1	1
Tunicate, encrusting translucent	15	1
Bare Metal	1	1
Encruster, red	1	1
Balanus nubilus	7	1
Barnacle, unid	8	2
Foliose red algae	1	1
Metridium farcimen	8	3
Zoanthid, solitary tan	16	16
Encruster - tan	1	1
Encruster - yellow	1	1
Encruster, pink	1	1
Galathea californiensis	4	1
Worm tubes, plain	6	1
Bivalve, nestling	3	1
Leucetta losangelensis	1	1
Encruster, green	1	1
Pollicipes polymerus	7	7
Plumularia sp	1	1
Sebastes sp	1	1
Bryozoa, white branching (colonies) (count)	1	0.5
Bryozoa, tan branching (colonies)	1	1
Encruster, lavender	1	1
Sponge, yellow encrusting	1	1
Metridium sp	2	2
Sponge, tan encrusting	1	1
Aeolidia papillosa?	1	1
Botrylloides sp.	1	1
Crassadoma gigantea	1	1
Egregia	1	1
Encruster - white	1	1
Hermisenda crassicornis	1	1
Leucilla nuttingi (colonies)	1	1
Pisaster ochraceus	1	1
Spionidae	1	1
Stylasterias forreri	1	1
Zoanthid, colonial tan	1	1

Platform Harvest - Leg B1 %																	
	DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	
	PHOTO CODE	029haD	028haD	027haD	026haD	023haD	025haD	024haD	022haD	021haD	020haD	019haD	018haD	017haD	016haD	015haD	014haD
	LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
	DEPTH (ft)	3	4	5	6	6.1	6.2	7	10	12	14	16	18	22	24	26	28
Corynactis californica (%)																	
Metridium senile %		4	2	5	5	1	2		2			2		2			40
Metridium farcimen %																	
Encruster, red %																	
Encruster, lavender (%)																	
Turf (%)		70	50	50	60	50	70	70	50	20	75	30	70	40	75	30	25
Mytilus		15	20	20	15	40	10	25	30	50	10	50	15	25	10	25	15
Botrylloides sp. %																	
Leucetta losangelensis (%)			1							5							
Encruster - yellow (%)																	
Foliose red algae (%)			25	20	15	5	5		10		10	7	10	20	20	20	25
Bare Metal (%)																	
Egregia %																	
Encruster - tan (%)																	
Sponge, tan encrusting (%)																	
Tunicate, encrusting translucent %																	
Anthopleura elegantissima (rosy morph) %		15	2	5	2	1	13	5	7	20	3	3	15	1	6	1	
Plumularia sp %					5	10											
Sponge, yellow encrusting (%)													1				
Encruster - white (%)																	
Encruster, green %					1												
Encruster, pink %																	
Zoanthid, colonial tan %																	
Bryozoa, tan branching (colonies) (%)																	
Leucilla nuttingi (colonies) (%)																	
line %																	

Platform Harvest - Leg B1 %																	
	DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	
	PHOTO CODE	013haD	012haD	011haD	010haD	009haD	008haD	007haD	006haD	005haD	004haD	003haD	002haD	001haD	065ha1241	064ha1241	063ha1240
	LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
	DEPTH (ft)	29	31	33	35	37	41	46	48	51	58	65	68	72	98	102	103
Corynactis californica (%)																90	60
Metridium senile %				40	75	50	80	75	90	90	90	15	60	90	90		5
Metridium farcimen %		25	30														
Encruster, red %																	
Encruster, lavender (%)																	
Turf (%)		25	15	25	5	25	5		5	5		10	25				
Mytilus		15		10	15			5									
Botrylloides sp. %												20					
Leucetta losangelensis (%)			10	20	15	10	5		5	5		20	15	10	15	15	30
Encruster - yellow (%)																	
Foliose red algae (%)		15	30	10	1	10	2	5			2	1					
Bare Metal (%)																	
Egregia %																	
Encruster - tan (%)											5	10					
Sponge, tan encrusting (%)								10									
Tunicate, encrusting translucent %																	
Anthopleura elegantissima (rosy morph) %												1					
Plumularia sp %																	
Sponge, yellow encrusting (%)						5	10										
Encruster - white (%)																	
Encruster, green %			5			1	5					0.5	1				
Encruster, pink %												0.5					
Zoanthid, colonial tan %																	
Bryozoa, tan branching (colonies) (%)																	
Leucilla nuttingi (colonies) (%)																	
line %																	

Platform Harvest - Leg B1 %																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	062ha1240	061ha1240	060ha1239	057ha1231	058ha1233	059ha1234	056ha1230	055ha1230	054ha1228	053ha1227	051ha1225	052ha1226	050ha1225	049ha1224	047ha1222	048ha1223
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	108	110	120	124	125	126	135	137	144	149	154	157	158	176	185	185.1
Corynactis californica (%)			15			3										
Metridium senile %	80	80	25	70	75	50	60	30	25	70	50	70	50	20	25	45
Metridium farcimen %																
Encruster, red %							2	10	2					10	10	10
Encruster, lavender (%)																
Turf (%)							5	5	20	15	10	20	20	15	10	20
Mytilus																
Botrylloides sp. %																
Leucetta losangelensis (%)	20	20	20	30	20	27	25	15	5				5			
Encruster - yellow (%)									10	5	10					
Foliose red algae (%)																
Bare Metal (%)					1			2		5	5	5		15	30	20
Egregia %																
Encruster - tan (%)			3			10	10	15			5			10		
Sponge, tan encrusting (%)																
Tunicate, encrusting translucent %																
Anthopleura elegantissima (rosy morph) %																
Plumularia sp %		2				5										
Sponge, yellow encrusting (%)																
Encruster - white (%)																
Encruster, green %																
Encruster, pink %									0.5	0.5			0.5	1	5	0.5
Zoanthid, colonial tan %																
Bryozoa, tan branching (colonies) (%)									0.5							
Leucilla nuttingi (colonies) (%)									0.5							
line %																

Platform Harvest - Leg B1 %																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	046ha1221	045ha1221	044ha1220	043ha1219	042ha1218	041ha1217	040ha1216	039ha1215	038ha1214	037ha1213	036ha1212	035ha1211	034ha1210	033ha1208	032ha1207	031ha1206
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	199	209	225	238	243	260	278	288	292	301	314	329	335	366	370	372
Corynactis californica (%)																
Metridium senile %	30	30	25	20	30	25	20	25	30	12	15	30	25	25	25	25
Metridium farcimen %																
Encruster, red %	5	20	30	60	30	10	25	60	30		55	40	60	50	40	75
Encruster, lavender (%)							15			65						
Turf (%)	10	15			5			10	10	1		10	10	10	15	10
Mytilus																
Botrylloides sp. %																
Leucetta losangelensis (%)			25						7							
Encruster - yellow (%)		1				65	25		5	30	2	10	5			0.5
Foliose red algae (%)																
Bare Metal (%)	20	20	5			1	15	10	10		5	10	10	20	20	7
Egregia %																
Encruster - tan (%)	10			20	15									5	1	
Sponge, tan encrusting (%)																
Tunicate, encrusting translucent %											15			2	10	
Anthopleura elegantissima (rosy morph) %																
Plumularia sp %																
Sponge, yellow encrusting (%)																
Encruster - white (%)						5										
Encruster, green %	0.5															
Encruster, pink %	3	0.5	0.5	0.5	1			0.5								
Zoanthid, colonial tan %													1			
Bryozoa, tan branching (colonies) (%)												0.5				
Leucilla nuttingi (colonies) (%)																
line %																

Platform Harvest - Leg B1 %																
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99
PHOTO CODE	030ha1205	029ha1204	028ha1203	027ha1203	026ha1157	025ha1157	024ha1156	023ha1154	022ha1153	021ha1151	019ha1147	020ha1148	018ha1144	017ha1142	016ha1141	015ha1140
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	395	399	402	409	418	425	432	455	481	504	519	519.1	533	569	581	585
Corynactis californica (%)																
Metridium senile %	30	50	30	50	25	10	25	25	20	10	60	50	70	30	50	50
Metridium farcimen %																
Encruster, red %	25	40	40	45	70	65	50	35	30	30	30	30	25	50	40	40
Encruster, lavender (%)													3			
Turf (%)	10	10	5	10	10	20	20	25	50	30	5	10		5	2	5
Mytilus																
Botrylloides sp. %																
Leucetta losangelensis (%)																
Encruster - yellow (%)	2															
Foliose red algae (%)																
Bare Metal (%)	5	5	5	2	10	10	10	10	5	15	10	10	1	20	10	10
Egregia %																
Encruster - tan (%)																
Sponge, tan encrusting (%)																
Tunicate, encrusting translucent %	15												1			5
Anthopleura elegantissima (rosy morph) %																
Plumularia sp %																
Sponge, yellow encrusting (%)																
Encruster - white (%)																
Encruster, green %																
Encruster, pink %																
Zoanthid, colonial tan %																
Bryozoa, tan branching (colonies) (%)							0.5									
Leucilla nuttingi (colonies) (%)																
line %					0.5											

Platform Harvest - Leg B1 %																	
DATE	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99	11/12/99				
PHOTO CODE	014ha1139	013ha1139	012ha1138	011ha1137	010ha1136	009ha1135	008ha1134	007ha1133	006ha1132	005ha1131	004ha1130	003ha1129					
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1					
DEPTH (ft)	597	601	614	618	625	635	641	647	650	659	664	669					
													Total	Average	No. of	Occurrence	
Corynactis californica (%)													168	42	92	4	
Metridium senile %	40	50	60	30	30	30	75	50	50		2	25	3159	38.52439	92	82	
Metridium farcimen %										100	15	15	185	37	92	5	
Encruster, red %	50	45	20	60	50	50	20	50	30		20	25	1699	35.39583	92	48	
Encruster, lavender (%)													83	27.66667	92	3	
Turf (%)	5	2	5	10	15	10	2	10			25	10	1537	21.34722	92	72	
Mytilus													420	21	92	20	
Botrylloides sp. %													20	20	92	1	
Leucetta losangelensis (%)													400	14.81481	92	27	
Encruster - yellow (%)													170.5	13.11538	92	13	
Foliose red algae (%)													268	12.18182	92	22	
Bare Metal (%)	10	5	20	5	20	15	5	10	15		25	50	554	11.54167	92	48	
Egregia %													10	10	92	1	
Encruster - tan (%)													119	9.153846	92	13	
Sponge, tan encrusting (%)									5				15	7.5	92	2	
Tunicate, encrusting translucent %					2								50	7.142857	92	7	
Anthopleura elegantissima (rosy morph) %													100	6.25	92	16	
Plumularia sp %													22	5.5	92	4	
Sponge, yellow encrusting (%)													16	5.333333	92	3	
Encruster - white (%)													5	5	92	1	
Encruster, green %													14	2	92	7	
Encruster, pink %													14.5	1.115385	92	13	
Zoanthid, colonial tan %													1	1	92	1	
Bryozoa, tan branching (colonies) (%)													1.5	0.5	92	3	
Leucilla nuttingi (colonies) (%)													0.5	0.5	92	1	
line %													0.5	0.5	92	1	

Platform Harvest - Leg B1 %		
	DATE	
	PHOTO CODE	
	LEG	
	DEPTH (ft)	Max Min
Corynactis californica (%)	90	3
Metridium senile %	90	1
Metridium farcimen %	100	15
Encruster, red %	75	2
Encruster, lavender (%)	65	3
Turf (%)	75	1
Mytilus	50	5
Botrylloides sp. %	20	20
Leucetta losangelensis (%)	30	1
Encruster - yellow (%)	65	0.5
Foliose red algae (%)	30	1
Bare Metal (%)	50	1
Egregia %	10	10
Encruster - tan (%)	20	1
Sponge, tan encrusting (%)	10	5
Tunicate, encrusting translucent %	15	1
Anthopleura elegantissima (rosy morph) %	20	1
Plumularia sp %	10	2
Sponge, yellow encrusting (%)	10	1
Encruster - white (%)	5	5
Encruster, green %	5	0.5
Encruster, pink %	5	0.5
Zoanthid, colonial tan %	1	1
Bryozoa, tan branching (colonies) (%)	0.5	0.5
Leucilla nuttingi (colonies) (%)	0.5	0.5
line %	0.5	0.5

Platform Harvest - Leg B2 counts																
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	025haD	024haD	018haD	021haD	026haD	027haD	032haD	020haD	029haD	022haD	023haD	028haD	030haD	031haD	019haD	017haD
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	2	3	4	4.1	4.2	4.3	4.4	5	5.1	6	6.1	6.2	7	7.1	8	10
Metridium senile			2	2					5		2					15
Ophiuroid unid			2													
Leucetta			6													8
Mytilus	110	33	32	53	45	53	41	40	43	53	34	90	65	37	35	37
Corynactis californica, individuals																
Balanus sp		5	2			3	4	1	1	2	2	9	2	3	8	
Anthopleura elegantissima (rosy morph)	2	2	7	10	5	12	5	10	10	10	20	7	15	7	20	15
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc	40				40	10						15	2			
Turf	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Worm tubes, calcareous																
Encruster, red																
Pollicipes polymerus	20				5	6						5				
Bare Metal																
Bryozoa, white branching (colonies) (count)																
Foliose red algae		1	1	1		1	1	1	1	1	1	1	1	1	1	
Tunicate, encrusting translucent																
Balanus nubilus																
Encruster, pink																
Leucetta losangelensis			1													1
Sponge, yellow encrusting		1					1	1			1				1	
Encruster - yellow														1		
Bryozoa, tan branching (colonies)																
Encruster, green						1							1			
Encruster - tan															1	
Encruster - white														1		
Galathea californiensis																
Leucilla nuttingi (colonies)																
Aeolidia papillosa?																
egg case																
Eudendrium sp?						1		1								
Plumularia sp																
Sponge, tan encrusting																
Anomiidae																
Bivalve, nestling																
Calliostoma sp																
Cancer antennarius																
Eudistylia polymorpha																1
Gastropoda, unid																
Oxylebius pictus																
Paracyathus stearnsi											1					
Sebastes sp																
Sponge, white encrusting																
Worm tubes, plain																

Platform Harvest - Leg B2 counts																
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/13/99
PHOTO CODE	016haD	015haD	014haD	013haD	012haD	011haD	010haD	009haD	008haD	007haD	006haD	005haD	004haD	003haD	002haD	061ha1309
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	12	14	18	24	25	27	30	40	42	47	52	54	64	69	72	88
Metridium senile	30	25	70	50	50	90	45	50	60	50	25	30	30	50	50	25
Ophiroid unid	2					3	4	15	12	25		30	80	40		175
Leucetta	35	40	25	50	40	10	30	50	40	50	60	60	70	50	50	75
Mytilus	3		1	29	23											
Corynactis californica, individuals		4					80				40					
Balanus sp	10	1	27		1		5	3	4	3	7	2	4	1		4
Anthopleura elegantissima (rosy morph)				3												
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																
Turf	1	1	1	1	1		1	1	1	1	1		1			1
Worm tubes, calcareous																
Encruster, red																
Pollicipes polymerus																
Bare Metal																
Bryozoa, white branching (colonies) (count)																
Foliose red algae	1	1	1	1		1	1				1					
Tunicate, encrusting translucent																
Balanus nubilus																
Encruster, pink																
Leucetta losangelensis	1															
Sponge, yellow encrusting																
Encruster - yellow																
Bryozoa, tan branching (colonies)																
Encruster, green	1											1				
Encruster - tan																
Encruster - white																
Galathea californiensis																
Leucilla nuttingi (colonies)																
Aeolidia papillosa?																
egg case																
Eudendrium sp?																
Plumularia sp																
Sponge, tan encrusting																
Anomiidae																
Bivalve, nestling												1				
Calliostoma sp																
Cancer antennarius												1				
Eudistylia polymorpha																
Gastropoda, unid																
Oxylebius pictus																
Paracyathus stearnsi																
Sebastes sp																
Sponge, white encrusting																
Worm tubes, plain										1						

Platform Harvest - Leg B2 counts																
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99
PHOTO CODE	060ha1309	059ha1308	058ha1308	057ha1308	056ha1307	055ha1307	054ha1305	053ha1305	052ha1305	051ha1303	050ha1302	049ha1302	048ha1302	047ha1302	046ha1259	045ha1259
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	90	95	100	101	105	111	122	127	129	145	150	153	155	158	196	199
Metridium senile	25	15	20	20	20	25	25	20	15	30	25	20	20	20	25	20
Ophiroid unid	150	100	65	180	150	140	100	60	70							
Leucetta	75	55	80	75	75	77	80	76	69	50	12					
Mytilus																
Corynactis californica, individuals		40		15												
Balanus sp		3	1	4	3	2	8	4	14	4			4		1	1
Anthopleura elegantissima (rosy morph)																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																
Turf							1		1	1	1	1	1	1	1	
Worm tubes, calcareous											1	1				
Encruster, red										1	1	1	1			1
Pollicipes polymerus																
Bare Metal								1				1	1		1	1
Bryozoa, white branching (colonies) (count)										1	1		1	2		
Foliose red algae																
Tunicate, encrusting translucent																
Balanus nubilus											1	9		3		
Encruster, pink											1	1	1	1	1	1
Leucetta losangelensis						1	1	1	1		1					
Sponge, yellow encrusting														1		
Encruster - yellow											1		1			
Bryozoa, tan branching (colonies)																
Encruster, green																
Encruster - tan																
Encruster - white																
Galathea californiensis																
Leucilla nuttingi (colonies)	1									1	1					
Aeolidia papillosa?																
egg case																
Eudendrium sp?																
Plumularia sp	1								1							
Sponge, tan encrusting																
Anomiidae													1			
Bivalve, nestling																
Calliostoma sp																
Cancer antennarius																
Eudistylia polymorpha																
Gastropoda, unid																
Oxylebius pictus			1												1	
Paracyathus stearnsi																
Sebastes sp																
Sponge, white encrusting																
Worm tubes, plain																

Platform Harvest - Leg B2 counts																
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99
PHOTO CODE	044ha1258	043ha1257	042ha1257	040ha1255	041ha1256	039ha1255	038ha1254	037ha1254	036ha1254	035ha1253	034ha1252	033ha1252	032ha1251	031ha1250	030ha1250	029ha1249
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	229	241	244	259	266	271	292	294	295	303	320	325	330	359	368	376
Metridium senile	25	25	25	40	15	15	20	25	25	25	15	50	20	25	20	20
Ophiuroid unid	21	4	50	4	5	11	26	8	6	3	8		3	8		5
Leucetta																
Mytilus									1							
Corynactis californica, individuals																
Balanus sp				4	1											
Anthopleura elegantissima (rosy morph)																
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc																
Turf		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Worm tubes, calcareous	1	1					1	2	3	2	1	2	3		2	4
Encruster, red	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pollicipes polymerus																
Bare Metal	1	1		1				1	1	1	1			1	1	1
Bryozoa, white branching (colonies) (count)					1					2	2	3			6	3
Foliose red algae																
Tunicate, encrusting translucent																
Balanus nubilus																
Encruster, pink	1	1		1	1	1			1	1						
Leucetta losangelensis																
Sponge, yellow encrusting						1										
Encruster - yellow					1						1	1			1	
Bryozoa, tan branching (colonies)							1	1								
Encruster, green																
Encruster - tan	1															
Encruster - white				1			1							1		
Galathea californiensis																
Leucilla nuttingi (colonies)		1														
Aeolidia papillosa?																2
egg case							2									1
Eudendrium sp?																
Plumularia sp																
Sponge, tan encrusting		1	1													
Anomiidae																
Bivalve, nestling																
Calliostoma sp																
Cancer antennarius																
Eudistylia polymorpha																
Gastropoda, unid																
Oxylebius pictus																
Paracyathus stearnsi																
Sebastes sp																
Sponge, white encrusting											1					
Worm tubes, plain																

Platform Harvest - Leg B2 counts																
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99
PHOTO CODE	028ha1249	027ha1249	026ha1248	025ha1247	024ha1247	023ha1246	021ha1245	020ha1245	019ha1244	018ha1244	017ha1243	015ha1241	014ha1240	013ha1240	012ha1239	011ha1239
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	390	392	407	411	413	427	442	444	477	483	504	557	558	568	569	573
Metridium senile	20	20	25	5	15	25	25	25	15	30	45	50	50	40	25	25
Ophiuroid unid	1															
Leucetta																
Mytilus																
Corynactis californica, individuals																
Balanus sp		1														
Anthopleura elegantissima (rosy morph)																
filamentous reds Polysiphonia, Neoptilota, Antithamion etc																
Turf	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Worm tubes, calcareous	2	1	2	10	12	4	4	2	3							2
Encruster, red	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Pollicipes polymerus																
Bare Metal	1	1	1	1	1			1	1	1	1		1	1	1	1
Bryozoa, white branching (colonies) (count)					2											
Foliose red algae																
Tunicate, encrusting translucent				5					10							
Balanus nubilus																
Encruster, pink																
Leucetta losangelensis																
Sponge, yellow encrusting					1											
Encruster - yellow																
Bryozoa, tan branching (colonies)		1		1		1			1							
Encruster, green																
Encruster - tan																
Encruster - white																
Galathea californiensis																
Leucilla nuttingi (colonies)																
Aeolidia papillosa?																
egg case																
Eudendrium sp?																
Plumularia sp																
Sponge, tan encrusting																
Anomiidae																
Bivalve, nestling																
Calliostoma sp																
Cancer antennarius																
Eudistylia polymorpha																
Gastropoda, unid																
Oxylebius pictus																
Paracyathus stearnsi																
Sebastes sp																
Sponge, white encrusting																
Worm tubes, plain																

Platform Harvest - Leg B2 counts												
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99						
PHOTO CODE	010ha1238	009ha1238	008ha1238	007ha1236	006ha1234	005ha1232						
LEG	B2	B2	B2	B2	B2	B2			No. of			
DEPTH (ft)	579	580	583	585	607	612	Total	Average	Photos	Occurrence	Max	Min
Metridium senile	60	50	40	25	50	60	2216	29.54667	86	75	90	2
Ophiroid unid							1566	44.74286	86	35	180	1
Leucetta							1473	50.7931	86	29	80	6
Mytilus							858	40.85714	86	21	110	1
Corynactis californica, individuals							179	35.8	86	5	80	4
Balanus sp							169	4.225	86	40	27	1
Anthopleura elegantissima (rosy morph)							160	9.411765	86	17	20	2
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc							107	21.4	86	5	40	2
Turf	1	1	1	1	1	1	71	1	86	71	1	1
Worm tubes, calcareous							2	68	2.833333	86	24	12
Encruster, red	1	1	1	1	1	1	43	1	86	43	1	1
Pollicipes polymerus							36	9	86	4	20	5
Bare Metal	1	1	1	1	1	1	34	1	86	34	1	1
Bryozoa, white branching (colonies) (count)				3			27	2.25	86	12	6	1
Foliose red algae							20	1	86	20	1	1
Tunicate, encrusting translucent						1	16	5.333333	86	3	10	1
Balanus nubilus							13	4.333333	86	3	9	1
Encruster, pink							13	1	86	13	1	1
Leucetta losangelensis							8	1	86	8	1	1
Sponge, yellow encrusting							8	1	86	8	1	1
Encruster - yellow							7	1	86	7	1	1
Bryozoa, tan branching (colonies)							6	1	86	6	1	1
Encruster, green							4	1	86	4	1	1
Encruster - tan							4	1	86	4	1	1
Encruster - white							4	1	86	4	1	1
Galathea californiensis	1	2	1				4	1.333333	86	3	2	1
Leucilla nuttingi (colonies)							4	1	86	4	1	1
Aeolidia papillosa?				1			3	1.5	86	2	2	1
egg case							3	1.5	86	2	2	1
Eudendrium sp?							2	1	86	2	1	1
Plumularia sp							2	1	86	2	1	1
Sponge, tan encrusting							2	1	86	2	1	1
Anomiidae							1	1	86	1	1	1
Bivalve, nestling							1	1	86	1	1	1
Calliostoma sp				1			1	1	86	1	1	1
Cancer antennarius							1	1	86	1	1	1
Eudistylia polymorpha							1	1	86	1	1	1
Gastropoda, unid							1	1	86	1	1	1
Oxylebius pictus							1	1	86	1	1	1
Paracyathus stearnsi							1	1	86	1	1	1
Sebastes sp						1	1	1	86	1	1	1
Sponge, white encrusting							1	1	86	1	1	1
Worm tubes, plain							1	1	86	1	1	1

Platform Harvest - Leg B2 %																
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	025haD	024haD	018haD	021haD	026haD	027haD	032haD	020haD	029haD	022haD	023haD	028haD	030haD	031haD	019haD	017haD
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	2	3	4	4.1	4.2	4.3	4.4	5	5.1	6	6.1	6.2	7	7.1	8	10
Encruster, red %																
Leucetta losangelensis (%)			5													10
Mytilus	90	40	40	50	60	60	30	35	35	35	25	60	20	25	20	15
Sponge, tan encrusting (%)																
Metridium senile %			2	2					5		2					15
Encruster - tan (%)														5		
Turf (%)	5	70	70	30	15	5	70	50	50	30	50	15	60	50	50	50
Sponge, yellow encrusting (%)		15					5	10			2				5	
Encruster - yellow (%)														1		
Corynactis californica (%)																
Anthopleura elegantissima (rosy morph) %	2	2	5	10	5	12	5	10	10	10	20	7	15	7	20	10
Bare Metal (%)																
Encruster - white (%)														2		
Foliose red algae (%)		10	0.5	10		15	3	0.5	5	25	5	5	5	1	2	
Tunicate, encrusting translucent %																
Bryozoa, tan branching (colonies) (%)																
Encruster, green %							1						2			
Eudendrium sp? %						2		5								
Plumularia sp %																
Sponge, white encrusting (%)																
Encruster, pink %																
Leucilla nuttingi (colonies) (%)																

Platform Harvest - Leg B2 %																
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/13/99
PHOTO CODE	016haD	015haD	014haD	013haD	012haD	011haD	010haD	009haD	008haD	007haD	006haD	005haD	004haD	003haD	002haD	061ha1309
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	12	14	18	24	25	27	30	40	42	47	52	54	64	69	72	88
Encruster, red %																
Leucetta losangelensis (%)	50	40	28	15	25	8	29	45	35	45	50	60	65	50	50	74
Mytilus	35		5	10	10											
Sponge, tan encrusting (%)																
Metridium senile %	30	25	70	50	50	90	45	50	60	50	25	30	30	50	50	25
Encruster - tan (%)																
Turf (%)	25	25	5	20	5		5	5	5	5	10		2			0.5
Sponge, yellow encrusting (%)																
Encruster - yellow (%)																
Corynactis californica (%)		1					20				10					
Anthopleura elegantissima (rosy morph) %				2												
Bare Metal (%)																
Encruster - white (%)																
Foliose red algae (%)	5	10	2	5		0.5	1				1					
Tunicate, encrusting translucent %																
Bryozoa, tan branching (colonies) (%)																
Encruster, green %	2											10				
Eudendrium sp? %																
Plumularia sp %																
Sponge, white encrusting (%)																
Encruster, pink %																
Leucilla nuttingi (colonies) (%)																

Platform Harvest - Leg B2 %																
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99
PHOTO CODE	060ha1309	059ha1308	058ha1308	057ha1308	056ha1307	055ha1307	054ha1305	053ha1305	052ha1305	051ha1303	050ha1302	049ha1302	048ha1302	047ha1302	046ha1259	045ha1259
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	90	95	100	101	105	111	122	127	129	145	150	153	155	158	196	199
Encruster, red %										5	10	5	3			60
Leucetta losangelensis (%)	70	65	80	75	75	75	75	70	80	55	10					
Mytilus																
Sponge, tan encrusting (%)																
Metridium senile %	25	15	20	20	20	25	25	20	15	30	25	20	20	20	25	20
Encruster - tan (%)															30	20
Turf (%)							5		5	5	10	25	40	60	20	
Sponge, yellow encrusting (%)														10		
Encruster - yellow (%)											5		1			
Corynactis californica (%)		20		4												
Anthopleura elegantissima (rosy morph) %																
Bare Metal (%)								1				10	1		2	10
Encruster - white (%)																
Foliose red algae (%)																
Tunicate, encrusting translucent %																
Bryozoa, tan branching (colonies) (%)																
Encruster, green %																
Eudendrium sp? %																
Plumularia sp %	1								5							
Sponge, white encrusting (%)																
Encruster, pink %											0.5	1	0.5	1	5	2
Leucilla nuttingi (colonies) (%)	1									1	1					

Platform Harvest - Leg B2 %																
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99
PHOTO CODE	044ha1258	043ha1257	042ha1257	040ha1255	041ha1256	039ha1255	038ha1254	037ha1254	036ha1254	035ha1253	034ha1252	033ha1252	032ha1251	031ha1250	030ha1250	029ha1249
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	229	241	244	259	266	271	292	294	295	303	320	325	330	359	368	376
Encruster, red %	25	30	30	50	20	30	50	60	60	70	50	40	80	60	75	75
Leucetta losangelensis (%)																
Mytilus																
Sponge, tan encrusting (%)		30	30													
Metridium senile %	25	25	25	40	15	15	20	25	25	25	15	50	20	25	20	20
Encruster - tan (%)	50															
Turf (%)		2	2	5	1	15	30	5	25	10		20	20	5		20
Sponge, yellow encrusting (%)						80										
Encruster - yellow (%)					70						25	5			5	
Corynactis californica (%)																
Anthopleura elegantissima (rosy morph) %																
Bare Metal (%)	2	2		10				5	1	5	5			2	5	5
Encruster - white (%)				3			10							15		
Foliose red algae (%)																
Tunicate, encrusting translucent %																
Bryozoa, tan branching (colonies) (%)							10	15								
Encruster, green %																
Eudendrium sp? %																
Plumularia sp %																
Sponge, white encrusting (%)											2					
Encruster, pink %	0.5	0.5		0.5	0.5	0.5				0.5	0.5					
Leucilla nuttingi (colonies) (%)		0.5														

Platform Harvest - Leg B2 %																
DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99
PHOTO CODE	028ha1249	027ha1249	026ha1248	025ha1247	024ha1247	023ha1246	021ha1245	020ha1245	019ha1244	018ha1244	017ha1243	015ha1241	014ha1240	013ha1240	012ha1239	011ha1239
LEG	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2	B2
DEPTH (ft)	390	392	407	411	413	427	442	444	477	483	504	557	558	568	569	573
Encruster, red %	60	80	70	90	70	75	75	60	60	70	50	50	50	50	70	60
Leucetta losangelensis (%)																
Mytilus																
Sponge, tan encrusting (%)																
Metridium senile %	20	20	25	5	15	25	25	25	15	30	45	50	50	40	25	25
Encruster - tan (%)																
Turf (%)	10	25	25	25	30	20	15	15	10	5	5	10	10	5	5	5
Sponge, yellow encrusting (%)					2											
Encruster - yellow (%)																
Corynactis californica (%)																
Anthopleura elegantissima (rosy morph) %																
Bare Metal (%)	20	5	5	1	1			10	10	0.5	5		2	10	5	20
Encruster - white (%)																
Foliose red algae (%)																
Tunicate, encrusting translucent %				5					10							
Bryozoa, tan branching (colonies) (%)		1		0.5		2			1							
Encruster, green %																
Eudendrium sp? %																
Plumularia sp %																
Sponge, white encrusting (%)																
Encruster, pink %																
Leucilla nuttingi (colonies) (%)																

Platform Harvest - Leg B2 %													
	DATE	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99	11/13/99						
	PHOTO CODE	010ha1238	009ha1238	008ha1238	007ha1236	006ha1234	005ha1232						
	LEG	B2	B2	B2	B2	B2	B2			No. of			
	DEPTH (ft)	579	580	583	585	607	612	Total	Average	Photos	Occurrence	Max	Min
Encruster, red %		25	20	40	60	30	30	2133	49.60465	86	43	90	3
Leucetta losangelensis (%)								1414	48.75862	86	29	80	5
Mytilus								700	35.00	86	20	90	5
Sponge, tan encrusting (%)								60	30	86	2	30	30
Metridium senile %		60	50	40	25	50	60	2216	29.54667	86	75	90	2
Encruster - tan (%)								105	26.25	86	4	50	5
Turf (%)		5	5	5	10	5	5	1367.5	19.26056	86	71	70	0.5
Sponge, yellow encrusting (%)								129	16.125	86	8	80	2
Encruster - yellow (%)								112	16	86	7	70	1
Corynactis californica (%)								55	11	86	5	20	1
Anthopleura elegantissima (rosy morph) %								152	8.941176	86	17	20	2
Bare Metal (%)		10	25	20	25	20	5	265.5	7.808824	86	34	25	0.5
Encruster - white (%)								30	7.5	86	4	15	2
Foliose red algae (%)								111.5	5.575	86	20	25	0.5
Tunicate, encrusting translucent %							1	16	5.333333	86	3	10	1
Bryozoa, tan branching (colonies) (%)								29.5	4.916667	86	6	15	0.5
Encruster, green %								15	3.75	86	4	10	1
Eudendrium sp? %								7	3.5	86	2	5	2
Plumularia sp %								6	3	86	2	5	1
Sponge, white encrusting (%)								2	2	86	1	2	2
Encruster, pink %								13.5	1.038462	86	13	5	0.5
Leucilla nuttingi (colonies) (%)								3.5	0.875	86	4	1	0.5

Platform Hidalgo - Leg A1 counts																	
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	023hiD	020hiD	021hiD	019hiD	022hiD	017hiD	018hiD	016hiD	015hiD	014hiD	013hi	012hiD	011hiD	010hiD	009hiD	008hiD	007hiD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	3	5	5.1	6	6.1	7	7.1	8	14	15	18	21	24	29	33	38	41
Metridium senile		38	41	1		33	30	40	55	130	88	150	180	185	240	210	185
Ophiroid unid			1	3		4	3	7	8	13	24	53	45	76	7	82	120
Mytilus	194	156	164	109	120	115	82	84	69	28	22	16	26	5			
Corynactis californica, individuals																	
Balanus nubilus			5	8		7	4	13	6	4				1	4	3	4
Metridium farcimen																	
Worm tubes, calcareous																	
Turf	1	1	1		1		1	1			1	1	1	1	1	1	1
Eudistylia polymorpha	6	13	3	3	2		5										
Leucetia losangelensis														1	1	1	1
Tetraclita squamosa					23												
Bare Metal																	
Encruster - tan																	
Foliose red algae	1			1						1	1		1	1	1	1	1
Pollicipes polymerus	1	1	1	2	2	3	2	1									
Zoanthid , solitary tan																	
Leucilla nuttingi (colonies)																	
Worm tubes, plain																	
Astrangia sp.												2			4		
Bryozoa, tan branching (colonies)																	
Strongylocentrotus purpuratus						1		1	1								
Balanus sp	4																
Bryozoa, white branching (colonies) (count)																	
Encruster, lavender																	
Sponge, tan encrusting																	
Alga, encrusting green														1			
egg case														1			
Encruster - white																	
Encruster - yellow																	
Pisaster giganteus									1								
Pisaster ochraceus																	
Stylasterias forreri																	
Amaroucium									1								
Archidoris montereyensis														1			
Oxylebius pictus																	
Pisaster brevispinis																	
Sebastes sp																	
Sponge, tan foliose																	
Sponge, yellow encrusting																	

Platform Hidalgo - Leg A1 counts																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99
PHOTO CODE	006hiD	005hiD	004hiD	003hiD	002hiD	001hiD	044hi1253	043hi1252	042hi1252	041hi1251	040hi1251	039hi1250	038hi1250	037hi1249	036hi1249	035hi1249	033hi1247	032hi1247
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	44	47	52	55	58	60	72	76	78	82	85	86	88	91	93	96	97	99
Metridium senile	255	240	250	250	275	240	235	225	70	90	150	180	240	225	220	220	145	150
Ophiuroid unid	87	50	27	28	20	45	47	88	125	225	250	130	30	70	40	27	150	176
Mytilus																		
Corynactis californica, individuals									15	30		75		10				
Balanus nubilus	1	2	1	1	1		3	3	2	2	1	4	1		4	1		
Metridium farcimen																		
Worm tubes, calcareous																		
Turf																		
Eudistylia polymorpha																		
Leucetta losangelensis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Tetraclita squamosa																		
Bare Metal																		
Encruster - tan											1							
Foliose red algae	1	1	1														1	
Pollicipes polymerus																		
Zoanthid , solitary tan																		
Leucilla nuttingi (colonies)	1													1	1			
Worm tubes, plain																		
Astrangia sp.																		
Bryozoa, tan branching (colonies)		1																
Strongylocentrotus purpuratus																		
Balanus sp																		
Bryozoa, white branching (colonies) (count)																		1
Encruster, lavender																		
Sponge, tan encrusting						1												
Alga, encrusting green egg case																	1	
Encruster - white																		
Encruster - yellow																		
Pisaster giganteus																		
Pisaster ochraceus										1								1
Stylasterias forreri																		
Amaroucium																		
Archidoris montereyensis																		
Oxylebius pictus																		
Pisaster brevispinis										1								
Sebastes sp																		
Sponge, tan foliose																		
Sponge, yellow encrusting																		

Platform Hidalgo - Leg A1 counts																		
DATE	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99
PHOTO CODE	031hi1247	030hi1246	029hi1245	028hi1245	027hi1244	026hi1243	025hi1243	024hi1242	023hi1237	022hi1236	021hi1235	020hi1234	019hi1232	018hi1231	017hi1229	016hi1226	015hi1225	014hi1223
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	100	101	118	133	145	163	171	189	222	243	256	285	299	318	338	355	386	392
Metridium senile	178	120	145	68	72	118	60	120	122	145	120	148	75	77	150	130	90	75
Ophiuroid unid	78	231	120	430	288	275	133	87	85	7	6	14	8	10		3		
Mytilus																		
Corynactis californica, individuals		9																
Balanus nubilus	2	4																
Metridium farcimen																		
Worm tubes, calcareous											2	2		4	3	3		1
Turf					1			1		1	1	1	1	1	1	1		1
Eudistylia polymorpha																		
Leucetta losangelensis	1	1	1	1	1		1	1	1									
Tetraclita squamosa																		
Bare Metal					1					1		1	1	1	1	1		1
Encruster - tan			1	1	1	1	1			1	1	1		1	1	1	1	
Foliose red algae																		
Pollicipes polymerus																		
Zoanthid , solitary tan																		1
Leucilla nuttingi (colonies)				1		1	1			1								
Worm tubes, plain							1				5							
Astrangia sp.																		
Bryozoa, tan branching (colonies)					1			1				1	1	1				
Strongylocentrotus purpuratus																		
Balanus sp																		
Bryozoa, white branching (colonies) (count)				1		1												
Encruster, lavender																		1
Sponge, tan encrusting									1									1
Alga, encrusting green egg case																		
Encruster - white			1			1												
Encruster - yellow								1			1							
Pisaster giganteus																		
Pisaster ochraceus																		
Stylasterias forreri																		
Amaroucium																		
Archidoris montereyensis																		
Oxylebius pictus			1															
Pisaster brevispinis																		
Sebastes sp																		1
Sponge, tan foliose																		
Sponge, yellow encrusting																		1

Platform Hidalgo - Leg A1 counts																
DATE	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99					
PHOTO CODE	013hi1223	012hi1222	011hi1221	010hi1220	009hi1220	008hi1219	007hi1218	006hi1218	005hi1217	004hi1217						
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			No. of			
DEPTH (ft)	398	401	409	415	418	420	424	427	429	430	Total	Average	Photos	Occurrence	Max	Min
Metridium senile	76	148	125	25	35	70	91				7849	135.3276	63	58	275	1
Ophiroid unid			2							4	3842	78.40816	63	49	430	1
Mytilus											1190	85	63	14	194	5
Corynactis californica, individuals											139	27.8	63	5	75	9
Balanus nubilus											92	3.407407	63	27	13	1
Metridium farcimen								34	20	19	73	24.33333	63	3	34	19
Worm tubes, calcareous	1	2	6	2	3	1	2	2	8	5	47	2.9375	63	16	8	1
Turf	1	1	1	1	1	1	1	1	1	1	34	1	63	34	1	1
Eudistylia polymorpha											32	5.333333	63	6	13	2
Leucetta losangelensis											30	1	63	30	1	1
Tetraclita squamosa											23	23	63	1	23	23
Bare Metal	1	1	1	1	1		1	1	1	1	17	1	63	17	1	1
Encruster - tan						1	1				15	1	63	15	1	1
Foliose red algae											13	1	63	13	1	1
Pollicipes polymerus											13	1.625	63	8	3	1
Zoanthid , solitary tan							12				13	6.5	63	2	12	1
Leucilla nuttingi (colonies)											7	1	63	7	1	1
Worm tubes, plain	1										7	2.333333	63	3	5	1
Astrangia sp.											6	3	63	2	4	2
Bryozoa, tan branching (colonies)											6	1	63	6	1	1
Strongylocentrotus purpuratus					1				1		5	1	63	5	1	1
Balanus sp											4	4	63	1	4	4
Bryozoa, white branching (colonies) (count)											3	1	63	3	1	1
Encruster, lavender		1		1							3	1	63	3	1	1
Sponge, tan encrusting											3	1	63	3	1	1
Alga, encrusting green											2	1	63	2	1	1
egg case							1				2	1	63	2	1	1
Encruster - white											2	1	63	2	1	1
Encruster - yellow											2	1	63	2	1	1
Pisaster giganteus								1			2	1	63	2	1	1
Pisaster ochraceus											2	1	63	2	1	1
Stylasterias forreri									2		2	2	63	1	2	2
Amaroucium											1	1	63	1	1	1
Archidoris montereyensis											1	1	63	1	1	1
Oxylebius pictus											1	1	63	1	1	1
Pisaster brevispinis											1	1	63	1	1	1
Sebastes sp											1	1	63	1	1	1
Sponge, tan foliose					1						1	1	63	1	1	1
Sponge, yellow encrusting											1	1	63	1	1	1

Platform Hidalgo - Leg A1 %																	
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	023hiD	020hiD	021hiD	019hiD	022hiD	017hiD	018hiD	016hiD	015hiD	014hiD	013hi	012hiD	011hiD	010hiD	009hiD	008hiD	007hiD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	3	5	5.1	6	6.1	7	7.1	8	14	15	18	21	24	29	33	38	41
Mytilus	75	65	65	85	85	85	60	60	80	30	45	35	25	5			
Metridium senile %		15	12	3		10	10	15	20	45	30	50	60	60	90	70	60
Encruster - yellow (%)																	
Leucetta losangelensis (%)													25	5	10	30	
Metridium farcimen %																	
Sponge, tan foliose (%)																	
Bare Metal (%)																	
Turf (%)	15	20	20		15		30	25		20	20	15	2	2	5	20	10
Encruster - tan (%)																	
Encruster, lavender (%)																	
Corynactis californica (%)																	
Sponge, tan encrusting (%)																	
Bryozoa, tan branching (colonies) (%)																	
Sponge, yellow encrusting (%)																	
Foliose red algae (%)	10			3						4	5		0.5	1	1	0.5	0.5
Amaroucium %									1								
Leucilla nuttingi (colonies) (%)																	
Encruster - white (%)																	
Alga, encrusting green (%)													0.5				

Platform Hidalgo - Leg A1 %																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99
PHOTO CODE	006hiD	005hiD	004hiD	003hiD	002hiD	001hiD	044hi1253	043hi1252	042hi1252	041hi1251	040hi1251	039hi1250	038hi1250	037hi1249	036hi1249	035hi1249	033hi1247	032hi1247
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	44	47	52	55	58	60	72	76	78	82	85	86	88	91	93	96	97	99
Mytilus																		
Metridium senile %	85	80	85	85	90	80	80	75	25	30	50	60	80	75	75	75	50	50
Encruster - yellow (%)																		
Leucetta losangelensis (%)	10	20	15	15	10	20	20	25	25	35	30	5	20	23	25	25	50	50
Metridium farcimen %																		
Sponge, tan foliose (%)																		
Bare Metal (%)																		
Turf (%)																		
Encruster - tan (%)											5							
Encruster, lavender (%)																		
Corynactis californica (%)									5	10		25		2				
Sponge, tan encrusting (%)						0.5								2				
Bryozoa, tan branching (colonies) (%)		1																
Sponge, yellow encrusting (%)																		
Foliose red algae (%)	1	1	0.5														0.5	
Amaroucium %																		
Leucilla nuttingi (colonies) (%)	0.5													0.5	0.5			
Encruster - white (%)																		
Alga, encrusting green (%)																0.5		

Platform Hidalgo - Leg A1 %																		
DATE	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99
PHOTO CODE	031hi1247	030hi1246	029hi1245	028hi1245	027hi1244	026hi1243	025hi1243	024hi1242	023hi1237	022hi1236	021hi1235	020hi1234	019hi1232	018hi1231	017hi1229	016hi1226	015hi1225	014hi1223
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	100	101	118	133	145	163	171	189	222	243	256	285	299	318	338	355	386	392
Mytilus																		
Metridium senile %	60	40	50	25	25	40	20	40	40	50	40	50	25	25	50	45	30	25
Encruster - yellow (%)								10		50								
Leucetta losangelensis (%)	40	60	30	30	15		25	25	40									
Metridium farcimen %																		
Sponge, tan foliose (%)																		
Bare Metal (%)					3					1		0.5	15	15	15	15		10
Turf (%)					5			10		25	20	15	15	10	10	10		10
Encruster - tan (%)			10	10	50	60	25			20	1	25		25	5	15	5	
Encruster, lavender (%)																		25
Corynactis californica (%)		3																
Sponge, tan encrusting (%)									20									3
Bryozoa, tan branching (colonies) (%)					2			3				5	15	15				
Sponge, yellow encrusting (%)																		3
Foliose red algae (%)																		
Amaroucium %																		
Leucilla nuttingi (colonies) (%)				0.5		0.5	3			0.5								
Encruster - white (%)			0.5			1												
Alga, encrusting green (%)																		

Platform Hidalgo - Leg A1 %																
DATE	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99	11/15/99						
PHOTO CODE	013hi1223	012hi1222	011hi1221	010hi1220	009hi1220	008hi1219	007hi1218	006hi1218	005hi1217	004hi1217						
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			No. of			
DEPTH (ft)	398	401	409	415	418	420	424	427	429	430	Total	Average	Photos	Occurrence	Max	Min
Mytilus											800	57.14286	63	14	85	5
Metridium senile %	25	50	50	35	35	30	25				2710	46.72414	63	58	90	3
Encruster - yellow (%)											60	30	63	2	50	10
Leucetta losangelensis (%)											758	25.26667	63	30	60	5
Metridium farcimen %								35	10	20	65	21.66667	63	3	35	10
Sponge, tan foliose (%)					20						20	20	63	1	20	20
Bare Metal (%)	30	5	10	10	10		25	50	60	40	314.5	18.5	63	17	60	0.5
Turf (%)	30	35	25	30	15	25	40	15	30	25	619	18.20588	63	34	40	2
Encruster - tan (%)						2	2				260	17.33333	63	15	60	1
Encruster, lavender (%)		5		15							45	15	63	3	25	5
Corynactis californica (%)											45	9	63	5	25	2
Sponge, tan encrusting (%)											23.5	7.833333	63	3	20	0.5
Bryozoa, tan branching (colonies) (%)											41	6.833333	63	6	15	1
Sponge, yellow encrusting (%)											3	3	63	1	3	3
Foliose red algae (%)											28.5	2.192308	63	13	10	0.5
Amaroucium %											1	1	63	1	1	1
Leucilla nuttingi (colonies) (%)											6	0.857143	63	7	3	0.5
Encruster - white (%)											1.5	0.75	63	2	1	0.5
Alga, encrusting green (%)											1	0.5	63	2	0.5	0.5

Platform Hidalgo - Leg B1 counts																	
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	033hiD	032hiD	024hiD	025hiD	028hiD	023hiD	027hiD	021hiD	022hiD	026hiD	020hiD	031hiD	019hiD	029hiD	017hiD	018hiD	030hiD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	0	1	3	3.1	3.2	4	4.1	5	5.1	5.2	6	6.1	7	7.1	8	8.1	8.2
Metridium senile	25	60		27	6	1	4	20	14	4	10	45		30	6		92
Mytilus	122	124	180	142	112	124	100	170	152	130	144	96	180	120	133	220	120
Ophiuroid unid				2	5	2		1	1								
Anthopleura elegantissima (rosy morph)				3	4									2			
Balanus sp	5	5		5			4			9		5			4	6	7
Metridium farcimen																	
Turf	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Worm tubes, calcareous																	
Ophiothrix spiculata		12										5		17			
Tetraclita squamosa			6			6	8			5		9					
Balanus nubilus																	
Leucetta losangelensis														1			
Eudistylia polymorpha		2	2	2		2		2	2	1	2	3	1	1	1		
Encruster, red																	
Encruster - blue																	
Bivalve, nestling																	
Foliose red algae	1								1		1						
Plumularia sp			1	1	1	1	1	1	1	1			1	1			
Encruster - yellow																	
Bryozoa, white branching (colonies) (count)																	
Worm tubes, plain																	
Bare Metal																	
Encruster - tan																	
Pisaster giganteus		2															
Pollicipes polymerus				2									1				2
Encruster - white																	
Encruster, green																	
Strongylocentrotus purpuratus	1							1			1						
Tunicate, encrusting translucent																	
Zoanthid , solitary tan																	
Leucilla nuttingi (colonies)																	
Metridium sp																	
Protula superba																	
Rhodymenia																	
Zoanthid, colonial tan																	
Asterina miniata = Patiria																	
Bryozoa, tan branching (colonies)																	
Egorgia										1							
Encruster - gray																	
Encruster, pink																	
Orthasterias koehlerii																	
Pisaster ochraceus																	
Sponge, tan encrusting																	
Sponge, yellow encrusting																	
Stylasterias forreri																	

Platform Hidalgo - Leg B1 counts																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	015hiD	014hiD	016hiD	013hiD	012hiD	011hiD	010hiD	009hiD	008hiD	007hiD	006hiD	005hiD	004hiD	003hiD	002hiD	001hiD	055hi1444	054hi1442
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	12	14	14.1	15	18	21	27	29	36	40	45	48	50	54	57	62	73	75
Metridium senile	78	25		140	69	58	18	12	72	21	27	180	150	161	221	245	160	120
Mytilus	56	47	142	56	30	10												
Ophiuroid unid		6		13	29		6	10	37	86	10	50	100		15		120	110
Anthopleura elegantissima (rosy morph)					40	100	150	185	100	180	85							
Balanus sp			4		1													
Metridium farcimen																1		
Turf	1	1	1	1	1	1	1			1	1							
Worm tubes, calcareous																		
Ophiothrix spiculata																		
Tetraclita squamosa		2		2														
Balanus nubilus							3	1		1		2	6	2	2		7	
Leucetia losangelensis						1		1	1	1	1	1	1	1	1	1	1	1
Eudistylia polymorpha	2	8																
Encruster, red																		
Encruster - blue																		
Bivalve, nestling	2	10																
Foliose red algae	1			1		1				1	1	1			1			
Plumularia sp						1												
Encruster - yellow																		
Bryozoa, white branching (colonies) (count)																		
Worm tubes, plain																		
Bare Metal								1										
Encruster - tan																		
Pisaster giganteus		1			1		1											
Pollicipes polymerus			1															
Encruster - white																		
Encruster, green													1				1	1
Strongylocentrotus purpuratus							1		1									
Tunicate, encrusting translucent																		
Zoanthid , solitary tan																		
Leucilla nuttingi (colonies)																		
Metridium sp																		
Protula superba																		
Rhodymenia									1				1					
Zoanthid, colonial tan																		
Asterina miniata = Patiria																		
Bryozoa, tan branching (colonies)																		
Egregia																		
Encruster - gray																		
Encruster, pink																		
Orthasterias koehleri																		
Pisaster ochraceus				1														
Sponge, tan encrusting														1				
Sponge, yellow encrusting		1																
Stylasterias forreri																		

Platform Hidalgo - Leg B1 counts																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	053hi1441	052hi1441	051hi1440	050hi1439	049hi1439	048hi1439	047hi1438	046hi1438	045hi1438	044hi1437	043hi1437	042hi1437	041hi1437	040hi1434	039hi1433	038hi1431	037hi1429	036hi1428
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	78	79	81	83	85	87	89	90	92	95	96	100	103	121	139	151	165	179
Metridium senile	145	138	118	147	165	118	201	185	199	170	165	95	30	60	116	121	60	55
Mytilus																		
Ophiuroid unid	90	110	95	110	30	48	20	16	12	23	15	100	260	250	144	200		200
Anthopleura elegantissima (rosy morph)																		
Balanus sp																		
Metridium farcimen																		
Turf			1															
Worm tubes, calcareous																		
Ophiothrix spiculata																		5
Tetraclita squamosa																		
Balanus nubilus	2	1	1					3	1									
Leucetta losangelensis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1
Eudistylia polymorpha																		
Encruster, red																		1
Encruster - blue																	1	
Bivalve, nestling																		
Foliose red algae			1															
Plumularia sp																		
Encruster - yellow																		
Bryozoa, white branching (colonies) (count)															1		1	
Worm tubes, plain																		
Bare Metal																		
Encruster - tan																		1
Pisaster giganteus						1												
Pollicipes polymerus																		
Encruster - white																		
Encruster, green		1		1														
Strongylocentrotus purpuratus																		
Tunicate, encrusting translucent																		
Zoanthid , solitary tan																		
Leucilla nuttingi (colonies)					1	1												
Metridium sp																		
Protula superba																		
Rhodymenia																		
Zoanthid, colonial tan																		
Asterina miniata = Patiria																		
Bryozoa, tan branching (colonies)																		
Egregia																		
Encruster - gray																		
Encruster, pink																		
Orthasterias koehleri																		
Pisaster ochraceus																		
Sponge, tan encrusting																		
Sponge, yellow encrusting																		
Stylasterias forreri																		

Platform Hidalgo - Leg B1 counts																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	035hi1427	034hi1426	033hi1425	031hi1424	030hi1422	029hi1420	025hi1417	024hi1416	022hi1413	020hi1411	019hi1408	018hi1407	017hi1405	016hi1404	015hi1404	014hi1402	013hi1401	012hi1401
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	181	199	215	232	255	279	299	315	329	340	368	381	389	391	399	410	412	419
Metridium senile	43	112	47	28	59	30	60	54	57	42	34	31	19	37	6			
Mytilus																		
Ophiuroid unid	200	32	10	35	28	18		1			5			3				
Anthopleura elegantissima (rosy morph)																		
Balanus sp																		
Metridium farcimen																		
Turf			1	1		1	1	1	1	1	1	1	1	1	1	1	1	1
Worm tubes, calcareous			3	5	3	2	2			3		1	2	2	3	3	2	2
Ophiothrix spiculata			2	1														
Tetraclita squamosa																		
Balanus nubilus																		
Leucetta losangelensis	1	1																
Eudistylia polymorpha																		
Encruster, red			1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Encruster - blue			1	1	1	1		1	1	1	1	1	1	1	1	1	1	1
Bivalve, nestling																		
Foliose red algae																		
Plumularia sp																		
Encruster - yellow		1		1		1	1	1	1	1	1			1	1			
Bryozoa, white branching (colonies) (count)		2	2	3														
Worm tubes, plain			2		3													3
Bare Metal																		
Encruster - tan			1		1		1		1		1							
Pisaster giganteus																		
Pollicipes polymerus																		
Encruster - white					1					1		1				1	1	
Encruster, green																		
Strongylocentrotus purpuratus																		
Tunicate, encrusting translucent										1	1			1	1			
Zoanthid , solitary tan					3													
Leucilla nuttingi (colonies)																		
Metridium sp																		
Protula superba				2														
Rhodymenia																		
Zoanthid, colonial tan					1	1												
Asterina miniata = Patiria																		
Bryozoa, tan branching (colonies)							1											
Egregia																		
Encruster - gray																		1
Encruster, pink			1															
Orthasterias koehleri																		
Pisaster ochraceus																		
Sponge, tan encrusting																		
Sponge, yellow encrusting																		
Stylasterias forreri																		

Platform Hidalgo - Leg B1 counts													
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99						
PHOTO CODE	01hi1400	010hi1400	009hi1400	008hi1359	007hi1359	006hi1358	005hi1358						
LEG	B1	B1	B1	B1	B1	B1	B1				No. of		
DEPTH (ft)	421	423	425	427	430	431	433	Total	Average	Photos	Occurrence	Max	Min
Metridium senile								5048	78.875	78	64	245	1
Mytilus								2710	117.8261	78	23	220	10
Ophiuroid unid	1							2659	59.08889	78	45	260	1
Anthopleura elegantissima (rosy morph)								849	84.9	78	10	185	2
Balanus sp								56	4.666667	78	12	9	1
Metridium farcimen					13	42		55	27.5	78	2	42	13
Turf	1	1	1	1	1	1	1	49	1	78	49	1	1
Worm tubes, calcareous	2	2	3	3	3	3	3	49	2.578947	78	19	5	1
Ophiothrix spiculata								42	7	78	6	17	1
Tetraclita squamosa								38	5.428571	78	7	9	2
Balanus nubilus								32	2.461538	78	13	7	1
Leucetta losangelensis								32	1	78	32	1	1
Eudistylia polymorpha								31	2.214286	78	14	8	1
Encruster, red								17	1	78	17	1	1
Encruster - blue								15	1	78	15	1	1
Bivalve, nestling								12	6	78	2	10	2
Foliose red algae								11	1	78	11	1	1
Plumularia sp								11	1	78	11	1	1
Encruster - yellow								10	1	78	10	1	1
Bryozoa, white branching (colonies) (count)								9	1.8	78	5	3	1
Worm tubes, plain							1	9	2.25	78	4	3	1
Bare Metal	1	1	1	1	1	1	1	8	1	78	8	1	1
Encruster - tan								6	1	78	6	1	1
Pisaster giganteus								6	1.2	78	5	2	1
Pollicipes polymerus								6	1.5	78	4	2	1
Encruster - white								5	1	78	5	1	1
Encruster, green								5	1	78	5	1	1
Strongylocentrotus purpuratus								5	1	78	5	1	1
Tunicate, encrusting translucent								4	1	78	4	1	1
Zoanthid , solitary tan								3	3	78	1	3	3
Leucilla nuttingi (colonies)								2	1	78	2	1	1
Metridium sp	1		1					2	1	78	2	1	1
Protula superba								2	2	78	1	2	2
Rhodymenia								2	1	78	2	1	1
Zoanthid, colonial tan								2	1	78	2	1	1
Asterina miniata = Patiria					1			1	1	78	1	1	1
Bryozoa, tan branching (colonies)								1	1	78	1	1	1
Egregia								1	1	78	1	1	1
Encruster - gray								1	1	78	1	1	1
Encruster, pink								1	1	78	1	1	1
Orthasterias koehleri						1		1	1	78	1	1	1
Pisaster ochraceus								1	1	78	1	1	1
Sponge, tan encrusting								1	1	78	1	1	1
Sponge, yellow encrusting								1	1	78	1	1	1
Stylasterias forreri	1							1	1	78	1	1	1

Platform Hidalgo - Leg B1 %																	
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	033hiD	032hiD	024hiD	025hiD	028hiD	023hiD	027hiD	021hiD	022hiD	026hiD	020hiD	031hiD	019hiD	029hiD	017hiD	018hiD	030hiD
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	0	1	3	3.1	3.2	4	4.1	5	5.1	5.2	6	6.1	7	7.1	8	8.1	8.2
Mytilus %	64	50	80	60	70	70	75	60	60	74	74	55	70	49	73	80	30
Anthopleura elegantissima (rosy morph) %				2	2									1			
Bare Metal (%)																	
Metridium senile %	10	25		10	2	0.5	2	7	5	1	5	20		10	2		30
Leucetta losangelensis (%)														10			
Turf (%)	25	25	15	25	20	5	20	25	25	15	20	25	20	25	25	20	40
Encruster, red %																	
Metridium farcimen %																	
Encruster - blue %																	
Encruster - yellow (%)																	
Encruster - tan (%)																	
Sponge, tan encrusting (%)																	
Zoanthid, colonial tan %																	
Plumularia sp %			5	2	5	25	2	5	10	5			10	5			
Encruster - white (%)																	
Egregia %										5							
Rhodomenia %																	
Encruster - gray %																	
Encruster, green %																	
Tunicate, encrusting translucent %																	
Encruster, pink %																	
Foliose red algae (%)	1								0.5		1						
Fishing line %																	
Leucilla nuttingi (colonies) (%)																	
Bryozoa, tan branching (colonies) (%)																	
Sponge, yellow encrusting (%)																	

Platform Hidalgo - Leg B1 %																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	015hiD	014hiD	016hiD	013hiD	012hiD	011hiD	010hiD	009hiD	008hiD	007hiD	006hiD	005hiD	004hiD	003hiD	002hiD	001hiD	055hi1444	054hi1442
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	12	14	14.1	15	18	21	27	29	36	40	45	48	50	54	57	62	73	75
Mytilus %	3	10	75	19	35	10												
Anthopleura elegantissima (rosy morph) %					20	50	75	95	50	90	50							
Bare Metal (%)							2											
Metridium senile %	25	10		50	20	20	5	4	25	7	10	90	70	80	95	98	70	50
Leucetta losangelensis (%)						10		10	25	3	30	10	25	10	5	2	30	50
Turf (%)	70	80	25	30	25	5	10			0.5	2							
Encruster, red %																		
Metridium farcimen %																		
Encruster - blue %																		
Encruster - yellow (%)																		
Encruster - tan (%)																		
Sponge, tan encrusting (%)																10		
Zoanthid, colonial tan %																		
Plumularia sp %						2												
Encruster - white (%)																		
Egregia %																		
Rhodomenia %									2				7					
Encruster - gray %																		
Encruster, green %													1				0.5	2
Tunicate, encrusting translucent %																		
Encruster, pink %																		
Foliose red algae (%)	2			0.5		2				0.5	5	1		2				
Fishing line %																		
Leucilla nuttingi (colonies) (%)																		
Bryozoa, tan branching (colonies) (%)																		
Sponge, yellow encrusting (%)		0.5																

Platform Hidalgo - Leg B1 %																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	053hi1441	052hi1441	051hi1440	050hi1439	049hi1439	048hi1439	047hi1438	046hi1438	045hi1438	044hi1437	043hi1437	042hi1437	041hi1437	040hi1434	039hi1433	038hi1431	037hi1429	036hi1428
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	78	79	81	83	85	87	89	90	92	95	96	100	103	121	139	151	165	179
Mytilus %																		
Anthopleura elegantissima (rosy morph) %																		
Bare Metal (%)																		
Metridium senile %	60	60	50	60	80	50	90	85	90	80	75	40	15	25	50	50	35	25
Leucetta losangelensis (%)	40	35	40	30	20	45	10	15	10	20	25	60	70	75	50	25		75
Turf (%)			10															
Encruster, red %																		5
Metridium farcimen %																		
Encruster - blue %																	15	
Encruster - yellow (%)																		
Encruster - tan (%)																		30
Sponge, tan encrusting (%)																		
Zoanthid, colonial tan %																		
Plumularia sp %																		
Encruster - white (%)																		
Egregia %																		
Rhodymenia %																		
Encruster - gray %																		
Encruster, green %		5		5														
Tunicate, encrusting translucent %																		
Encruster, pink %																		
Foliose red algae (%)			0.5															
Fishing line %																		
Leucilla nuttingi (colonies) (%)					0.5	1												
Bryozoa, tan branching (colonies) (%)																		
Sponge, yellow encrusting (%)																		

Platform Hidalgo - Leg B1 %																		
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99
PHOTO CODE	035hi1427	034hi1426	033hi1425	031hi1424	030hi1422	029hi1420	025hi1417	024hi1416	022hi1413	020hi1411	019hi1408	018hi1407	017hi1405	016hi1404	015hi1404	014hi1402	013hi1401	012hi1401
LEG	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1	B1
DEPTH (ft)	181	199	215	232	255	279	299	315	329	340	368	381	389	391	399	410	412	419
Mytilus %																		
Anthopleura elegantissima (rosy morph) %																		
Bare Metal (%)																		
Metridium senile %	20	50	20	15	30	20	35	30	30	20	15	20	25	15	10			
Leucetta losangelensis (%)	80	30																
Turf (%)			25	25		20	25	15	40	30	30	25	30	60	50	50	25	60
Encruster, red %			5	25	20	20	30	10	15	20	15	20	25	15	15	30	70	40
Metridium farcimen %																		
Encruster - blue %			25	15	20	10		5	1	0.5	5	15	10	10	10	25	30	
Encruster - yellow (%)		20		10		1	25	50	10	0.5	1			1	2			
Encruster - tan (%)			5		15		0.5		2		10							
Sponge, tan encrusting (%)																		
Zoanthid, colonial tan %					0.5	15												
Plumularia sp %																		
Encruster - white (%)					10					1		10				4	0.5	
Egregia %																		
Rhodomenia %																		
Encruster - gray %																		3
Encruster, green %																		
Tunicate, encrusting translucent %										2	1			1	5			
Encruster, pink %			2															
Foliose red algae (%)																		
Fishing line %					0.5							0.5						
Leucilla nuttingi (colonies) (%)																		
Bryozoa, tan branching (colonies) (%)							0.5											
Sponge, yellow encrusting (%)																		

Platform Hidalgo - Leg B1 %													
DATE	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99	11/14/99						
PHOTO CODE	011hi1400	010hi1400	009hi1400	008hi1359	007hi1359	006hi1358	005hi1358						
LEG	B1	B1	B1	B1	B1	B1	B1				No. of		
DEPTH (ft)	421	423	425	427	430	431	433	Total	Average	Photos	Occurrence	Max	Min
Mytilus %								1246	54.17391	78	23	80	3
Anthopleura elegantissima (rosy morph) %								435	43.5	78	10	95	1
Bare Metal (%)	20	25	50	40	65	60	50	312	39	78	8	65	2
Metridium senile %								2233.5	34.89844	78	64	98	0.5
Leucetta losangelensis (%)								975	30.46875	78	32	80	2
Turf (%)	75	65	50	60	10	20	50	1472.5	30.05102	78	49	80	0.5
Encruster, red %								380	22.35294	78	17	70	5
Metridium farcimen %					20	15		35	17.5	78	2	20	15
Encruster - blue %								196.5	13.1	78	15	30	0.5
Encruster - yellow (%)								120.5	12.05	78	10	50	0.5
Encruster - tan (%)								62.5	10.41667	78	6	30	0.5
Sponge, tan encrusting (%)								10	10	78	1	10	10
Zoanthid, colonial tan %								15.5	7.75	78	2	15	0.5
Plumularia sp %								76	6.909091	78	11	25	2
Encruster - white (%)								25.5	5.1	78	5	10	0.5
Egregia %								5	5	78	1	5	5
Rhodomenia %								9	4.5	78	2	7	2
Encruster - gray %								3	3	78	1	3	3
Encruster, green %								13.5	2.7	78	5	5	0.5
Tunicate, encrusting translucent %								9	2.25	78	4	5	1
Encruster, pink %								2	2	78	1	2	2
Foliose red algae (%)								16	1.454545	78	11	5	0.5
Fishing line %	0.5	3						4.5	1.125	78	4	3	0.5
Leucilla nuttingi (colonies) (%)								1.5	0.75	78	2	1	0.5
Bryozoa, tan branching (colonies) (%)								0.5	0.5	78	1	0.5	0.5
Sponge, yellow encrusting (%)								0.5	0.5	78	1	0.5	0.5

Platform Habitat - Leg A1 counts																
DATE	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99
PHOTO CODE	021habD	026habD	016habD	020habD	019habD	025habD	018habD	022habD	027habD	024habD	029habD	023habD	028habD	017habD	015habD	014habD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	4	4.1	4.2	5	6	6.1	7	7.1	7.2	8	8.1	9	9.1	11	13	18
Corynactis californica													12			
Mytilus sp	6	12	7	14	60	16	60	14	25	48	35	80	15	60	37	14
Metridium senile	6	16		32	18	22	29	2	35	8	55	60	11	57	39	13
Ophiothrix spiculata	2	23		30		9		6	7				10		30	6
Balanus nubilus		18	11	12	31	26	36	15	44	22	30	34	7	64	36	23
Anthopleura elegantissima (rosy morph)	15	19	75	2		26		26	21	4			6			13
Paracalyptus stearnsi																
Triopha catalinae																
Metridium sp																
Corallina																
Staurocalyptus																
Turf																
Crisia/Filicrisia																
Oxylebius pictus																
filamentous reds Polysiphonia, Neoptilota,	1	1		1	1	1	1	1	1	1	1	1	1	1		1
Crassadoma gigantea																
Mytilus californianus																
Bugula																
Sponge, tan encrusting	1				1	1		1	1				1		1	1
Foliose red algae																
Sponge, white encrusting																
Henricia sanguinolenta?																
Zoanthid (Palythoa)																
Flabellina iodinea																
Hydrozoa colony									1		5	1		1		
Encruster - yellow															1	
Sponge, yellow encrusting								1								
Barnacle, unid																
Bryozoa, tan branching (colonies)																
Anthopleura sp														2		
Encruster - white																
Parastichopus californicus																
Worm tubes, calcareous																
Bare Metal																
Bryozoa, white branching (colonies)																
Encruster - green																
Encruster - tan																
Encrusting coralline																
Hippodiplosia																
Orthasterias koehleri																
Poraniopsis inflata																
Salmacina																
Ulva				1												
Worm, Feather Duster																

Platform Habitat - Leg A1 counts																
DATE	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/12/99	10/12/99	10/12/99
PHOTO CODE	013habD	012habD	011habD	010habD	009habD	008habD	007habD	006habD	005habD	004habD	003habD	002habD	001habD	047hh1522	046hh1522	043hh1521
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	19	24	29	30	34	35	37	41	45	46	48	52	56	60	61	64
Corynactis californica													700	500	600	525
Mytilus sp	3			4	13	7	10	66	66	75	50	50				
Metridium senile	11		14	4	22	22	22				48	30				
Ophiothrix spiculata	5			17	25	7	60			13	73	66	1			
Balanus nubilus	7	10	2	2	3	1								2	2	5
Anthopleura elegantissima (rosy morph)	8	75	9	12	11	1	10									
Paracyathus stearnsi																
Triopha catalinae											5	15		5		
Metridium sp																
Corallina																
Staurocalyptus								5		20	10	5				
Turf						1										
Crisia/Filicrisia																
Oxylebius pictus									4			20				
filamentous reds Polysiphonia, Neoptilota,	1		1	1	1			1		1	1	1				
Crassadoma gigantea													4	5	2	3
Mytilus californianus								13			3	3				
Bugula																
Sponge, tan encrusting	1		1	1	1	1										
Foliose red algae			5			6										
Sponge, white encrusting											1	1				
Henricia sanguinolente?																
Zoanthid (Palythoa)												1				
Flabellina iodinea										1	2	5				
Hydrozoa colony																
Encruster - yellow																
Sponge, yellow encrusting	1					1	1									
Barnacle, unid														3		
Bryozoa, tan branching (colonies)																
Anthopleura sp																
Encruster - white															1	
Parastichopus californicus																
Worm tubes, calcareous									1							
Bare Metal																
Bryozoa, white branching (colonies)																
Encruster - green				1												
Encruster - tan																
Encrusting coralline																
Hippodiplosia									1							
Orthasterias koehleri																
Poraniopsis inlata																
Salmacina															1	
Ulva																
Worm, Feather Duster				1												

Platform Habitat - Leg A1 counts																	
DATE	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	?	?	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99
PHOTO CODE	041hh1520	039hh1519	038hh1518	036hh1516	035hh1516	034hh1516	033hh1515	032hh1513	031hh1513	029hh1511	030hh1512	028hh1509	027hh1507	026hh1507	025hh1505	024hh1504	023hh1504
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	68	70	72	76	77	78	80	81	83	94	94.1	108	120	123	129	134	139
Corynactis californica	515	520	680	540	650	640	690	630	650	640	600	475	350	280	240	350	400
Mytilus sp																	
Metridium senile					3									1			
Ophiothrix spiculata		15	1	10	5	2	2	1	12	3	1	12	6	11	32	27	11
Balanus nubilus	5	1	2	5	3	5	3	6		2	3	1		1	1	2	
Anthopleura elegantissima (rosy morph)																	
Paracyathus stearnsi											1	5	12	28	23	53	29
Triopha catalinae	2	5	1			0.5			0.5	1	0.5	2	5	5	5		10
Metridium sp													1				
Corallina														4	2		
Staurocalyptus									2					2	2	7	
Turf	1	1	1				1		1	1	1	1	1	1	1		1
Crisia/Filicrisia		3	4	1			3	1		1	3		1				
Oxylebius pictus																	
filamentous reds Polysiphonia, Neoptilota,																	
Crassadoma gigantea	1		2	1			3				1						
Mytilus californianus											1						
Bugula											1				2		1
Sponge, tan encrusting																	
Foliose red algae																	
Sponge, white encrusting				1								1		1	1	1	1
Henricia sanguinolente?										1	0.5		9				
Zoanthid (Palythoa)																2	1
Fiabellina iodinea																	
Hydrozoa colony																	
Encruster - yellow					1		1			1			1				
Sponge, yellow encrusting																	
Barnacle, unid																	
Bryozoa, tan branching (colonies)																	
Anthopleura sp																	
Encruster - white						1											
Parastichopus californicus													1				
Worm tubes, calcareous																	
Bare Metal																	1
Bryozoa, white branching (colonies)								1									
Encruster - green																	
Encruster - tan																	
Encrusting coralline		0.5														0.5	
Hippodiplosia																	
Orthasterias koehleri					1												
Poraniopsis inflata											1						
Salmacina																	
Ulva																	
Worm, Feather Duster																	

Platform Habitat - Leg A1 counts																	
DATE	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99
PHOTO CODE	022hh1502	021hh1501	020hh1500	019hh1459	018hh1459	017hh1456	016hh1456	014hh1454	015hh1455	013hh1453	012hh1452	011hh1452	010hh1451	009hh1450	008hh1447	007hh1447	006hh1446
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	152	158	172	175	178	190	192	196	196.1	205	213	217	223	233	259	262	269
Corynactis californica	365	250	300	345	305	365	405	465	475	302		35					
Mytilus sp																	
Metridium senile																14	
Ophiothrix spiculata	5	18	8		1												
Balanus nubilus																	
Anthopleura elegantissima (rosy morph)																	
Paracalyptus stearnsi	28	52	13	15	15	7				21		26	3				
Triopha catalinae	10	10	25	10		15	15	10	10	15	5	20	10	2	10		
Metridium sp					1	1		5			20	11	25	14	13		2
Corallina	5	6	1	6	4	7	1	8	4	5							
Staurocalyptus																	
Turf	1	1	1	1		1	1	1	1	1	1	1	1	1	1		
Crisia/Filicrisia					1		1										
Oxylebius pictus																	
filamentous reds Polysiphonia, Neoptilota,																	
Crassadoma gigantea																	
Mytilus californianus																	
Bugula	1	4	3		1	3	2	0.5	1								
Sponge, tan encrusting				1													
Foliose red algae																	
Sponge, white encrusting		1		1	1												
Henricia sanguinolenta?																	
Zoanthid (Palythoa)	3									2			1				
Flabellina iodinea																	
Hydrozoa colony																	
Encruster - yellow																	
Sponge, yellow encrusting																	
Barnacle, unid																	
Bryozoa, tan branching (colonies)			0.5						2								
Anthopleura sp																	
Encruster - white																	
Parastichopus californicus								1									
Worm tubes, calcareous																	1
Bare Metal																	
Bryozoa, white branching (colonies)																	
Encruster - green																	
Encruster - tan																	
Encrusting coralline																	
Hippodiplosia																	
Orthasterias koehleri																	
Poraniopsis inflata																	
Salmacina																	
Ulva																	
Worm, Feather Duster																	

Platform Habitat - Leg A1 counts										
DATE	10/12/99	10/12/99	10/12/99	10/12/99						
PHOTO CODE	005hh1446	004hh1445	003hh1444	002hh1444						
LEG	A1	A1	A1	A1			No. of			
DEPTH (ft)	270	275	279	283	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica					14799	448.4545	70	33	700	12
Mytilus sp					847	32.57692	70	26	80	3
Metridium senile					594	22.84615	70	26	60	1
Ophiothrix spiculata		1		1	575	14.375	70	40	73	1
Balanus nubilus					483	12.71053	70	38	64	1
Anthopleura elegantissima (rosy morph)					333	19.58824	70	17	75	1
Paracyathus stearnsi					331	20.6875	70	16	53	1
Triopha catalinae				95	324.5	10.81667	70	30	95	0.5
Metridium sp	1	2	8	3	107	7.642857	70	14	25	1
Corallina					53	4.416667	70	12	8	1
Staurocalyptus					53	6.625	70	8	20	2
Turf				1	29	1	70	29	1	1
Crisia/Filicrisia					26	2	70	13	4	1
Oxylebius pictus					24	12	70	2	20	4
filamentous reds Polysiphonia, Neoptilota,					23	1	70	23	1	1
Crassadoma gigantea					22	2.444444	70	9	5	1
Mytilus californianus					20	5	70	4	13	1
Bugula					19.5	1.772727	70	11	4	0.5
Sponge, tan encrusting					14	1	70	14	1	1
Foliose red algae					11	5.5	70	2	6	5
Sponge, white encrusting					11	1	70	11	1	1
Henricia sanguinolente?					10.5	3.5	70	3	9	0.5
Zoanthid (Palythoa)					10	1.666667	70	6	3	1
Flabellina iodinea					8	2.666667	70	3	5	1
Hydrozoa colony					8	2	70	4	5	1
Encruster - yellow	1				6	1	70	6	1	1
Sponge, yellow encrusting					4	1	70	4	1	1
Barnacle, unid					3	3	70	1	3	3
Bryozoa, tan branching (colonies)					2.5	1.25	70	2	2	0.5
Anthopleura sp					2	2	70	1	2	2
Encruster - white					2	1	70	2	1	1
Parastichopus californicus					2	1	70	2	1	1
Worm tubes, calcareous					2	1	70	2	1	1
Bare Metal					1	1	70	1	1	1
Bryozoa, white branching (colonies)					1	1	70	1	1	1
Encruster - green					1	1	70	1	1	1
Encruster - tan	1				1	1	70	1	1	1
Encrusting coralline					1	0.5	70	2	0.5	0.5
Hippodiplosia					1	1	70	1	1	1
Orthasterias koehleri					1	1	70	1	1	1
Poraniopsis inflata					1	1	70	1	1	1
Salmacina					1	1	70	1	1	1
Ulva					1	1	70	1	1	1
Worm, Feather Duster					1	1	70	1	1	1

Platform Habitat - Leg A1 %																
DATE	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99
PHOTO CODE	021habD	026habD	016habD	020habD	019habD	025habD	018habD	022habD	027habD	024habD	029habD	023habD	028habD	017habD	015habD	014habD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	4	4.1	4.2	5	6	6.1	7	7.1	7.2	8	8.1	9	9.1	11	13	18
Corynactis californica (%)											1					
Mytilus sp (%)	7	15	9	18	60	20	60	18	31	60	44	100	19	75	46	18
Zoanthid (Palythoa) (%)																
Anthopleura elegantissima (rosy morph) (%)	19	5.5	95	3		33		33	13.5	5			8			17
filamentous reds Polysiphonia, Neoptilota, Shadow (%)	15	50		50	40	10	50	5	40	40	2	40	10	5		5
Metridium senile %	33	12						5	5	33	10	15	15			
Ophiothrix spiculata (%)	3	8		16	9	11	15	1	18	4	28	30	6	29	20	7
Turf (%)	2	23		30		9		6	7				10		30	6
Sponge, tan encrusting (%)	3				2	15		1	1				2		3	10
Paracyathus stearnsi (%)																
Sponge, white encrusting (%)																
Ulva (%)				2												
Bare Metal (%)																
Sponge, yellow encrusting (%)								0.5								
Encruster - yellow %																
Encruster - white (%)															0.5	
Encruster - green (%)																
Encruster - tan (%)																

Platform Habitat - Leg A1 %																
DATE	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/13/99	10/12/99	10/12/99	10/12/99
PHOTO CODE	013habD	012habD	011habD	010habD	009habD	008habD	007habD	006habD	005habD	004habD	003habD	002habD	001habD	047hh1522	046hh1522	043hh1521
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	19	24	29	30	34	35	37	41	45	46	48	52	56	60	61	64
Corynactis californica (%)													100	90	95	90
Mytilus sp (%)	4			5	16	9	12	82	83	94	80	70				
Zoanthid (Palythoa) (%)												1				
Anthopleura elegantissima (rosy morph) (%)	10	95	11	15	14	1	13									
filamentous reds Polysiphonia, Neoptilota, Shadow (%)	50		40	50	5			3		1	5	2			1	
Metridium senile %	6		7	2	11	11	11				5	27				
Ophiolithrix spiculata (%)	5			17	25	7	60			13	15	5	1			
Turf (%)						0.5								5		
Sponge, tan encrusting (%)	5		15	40	3	10										
Paracyathus stearnsi (%)																
Sponge, white encrusting (%)											0.5	2.5				
Ulva (%)																
Bare Metal (%)																
Sponge, yellow encrusting (%)	0.5					1	0.5									
Encruster - yellow %																
Encruster - white (%)														0.5		
Encruster - green (%)				0.5												
Encruster - tan (%)																

Platform Habitat - Leg A1 %																	
DATE	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99
PHOTO CODE	041hh1520	039hh1519	038hh1518	036hh1516	035hh1516	034hh1516	033hh1515	032hh1513	031hh1513	029hh1511	030hh1512	028hh1509	027hh1507	026hh1507	025hh1505	024hh1504	023hh1504
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	68	70	72	76	77	78	80	81	83	94	94.1	108	120	123	129	134	139
Corynactis californica (%)	90	90	98	90	95	95	98	95	95	95	90	80	70	60	40	60	75
Mytilus sp (%)																	
Zoanthid (Palythoa) (%)																2	1
Anthopleura elegantissima (rosy morph) (%)																	
filamentous reds Polysiphonia, Neoptilota, Shadow (%)																	
Metridium senile %					1									0.5			
Ophiotrix spiculata (%)		5	1	2	2	1	1	1	5	2	1	12	12	11	32	27	11
Turf (%)	2	5	1				0.5		0.5	1	0.5	2	5	5	5		10
Sponge, tan encrusting (%)																	
Paracyathus stearnsi (%)											1	2	4	5	5	8	5
Sponge, white encrusting (%)				0.5								10		1	10	5	5
Ulva (%)																	
Bare Metal (%)																	1
Sponge, yellow encrusting (%)																	
Encruster - yellow %					0.5		0.5			0.5				0.5			
Encruster - white (%)						0.5											
Encruster - green (%)																	
Encruster - tan (%)																	

Platform Habitat - Leg A1 %																	
DATE	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99	10/12/99
PHOTO CODE	022hh1502	021hh1501	020hh1500	019hh1459	018hh1459	017hh1456	016hh1456	014hh1454	015hh1455	013hh1453	012hh1452	011hh1452	010hh1451	009hh1450	008hh1447	007hh1447	006hh1446
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	152	158	172	175	178	190	192	196	196.1	205	213	217	223	233	259	262	269
Corynactis californica (%)	70	40	50	70	50	65	75	80	80	50		5					
Mytilus sp (%)																	
Zoanthid (Palythoa) (%)	3									2			1			50	98
Anthopleura elegantissima (rosy morph) (%)																	
filamentous reds Polysiphonia, Neoptilota, Shadow (%)																	
Metridium senile %																7	
Ophiolithrix spiculata (%)	5	18	8		1												
Turf (%)	10	10	25	10		15	15	10	10	15	5	20	10	2	10		
Sponge, tan encrusting (%)				1													
Paracyathus stearnsi (%)	6	10	10	8	8	5				1		2	3				
Sponge, white encrusting (%)		5		2	10												
Ulva (%)																	
Bare Metal (%)																	
Sponge, yellow encrusting (%)																	
Encruster - yellow %																	
Encruster - white (%)																	
Encruster - green (%)																	
Encruster - tan (%)																	

Platform Habitat - Leg A1 %										
DATE	10/12/99	10/12/99	10/12/99	10/12/99						
PHOTO CODE	005hh1446	004hh1445	003hh1444	002hh1444						
LEG	A1	A1	A1	A1			No. of			
DEPTH (ft)	270	275	279	283	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica (%)					2427	73.54545	70	33	100	1
Mytilus sp (%)					1055	40.57692	70	26	100	4
Zoanthid (Palythoa) (%)	99	95	3		355	32.27273	70	11	99	1
Anthopleura elegantissima (rosy morph) (%)					391	23	70	17	95	1
filamentous reds Polysiphonia, Neoptilota, Shadow (%)					519	22.56522	70	23	50	1
Metridium senile %					128	16	70	8	33	5
Ophiothrix spiculata (%)		1		1	293.5	11.28846	70	26	30	0.5
Turf (%)				95	431	10.775	70	40	60	1
Sponge, tan encrusting (%)					305	10.51724	70	29	95	0.5
Paracyathus stearnsi (%)					111	7.928571	70	14	40	1
Sponge, white encrusting (%)					83	5.1875	70	16	10	1
Ulva (%)					51.5	4.681818	70	11	10	0.5
Bare Metal (%)					2	2	70	1	2	2
Sponge, yellow encrusting (%)					1	1	70	1	1	1
Encruster - yellow %	0.5				2.5	0.625	70	4	1	0.5
Encruster - white (%)					3	0.5	70	6	0.5	0.5
Encruster - green (%)					1	0.5	70	2	0.5	0.5
Encruster - tan (%)	0.5				0.5	0.5	70	1	0.5	0.5

Platform Irene - Leg A1 counts																		
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00
PHOTO CODE	014irD	030irD	013irD	033irD	016irD	031irD	011irD	019irD	020irD	023irD	032irD	029irD	010irD	018irD	009irD	008irD	007irD	005irD
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	1	1.1	2	2.1	3	3.1	4	4.1	4.2	4.3	4.4	6	8	8.1	9	10	11	13
Metridium senile			375		125		165	45	27	150	15		250	350	200	400	370	380
Mytilus californianus	21	21	35	5	35	28	47	124	105	56	21	42	70	42	84	28	35	35
Tetraclita squamosa	56	57	7	200	35	50	22	34	10	20	57	50	33	26				
Balanus sp																14	4	
Anthopleura elegantissima (rosy morph)								17									5	
Worm tubes, calcareous																		
Corynactis californica, individuals			4		15		10	33	4	9		15	3	7		1		
Ophiothrix spiculata																5	7	5
Mytilus																		
Anthopleura sp (whitish, no rose)												22						
Sponge, yellow encrusting																		
Pisaster ochraceus																		
Metridium, dark or Feather Duster																		
Cancer antennarius																		
Metridium farcimen																		
Strongylocentrotus purpuratus								2		1				2			4	
Feather Duster Worm																		
Pollicipes polymerus	1			1		4												
Fuzz	1	1				1					1				1			
Serpulidae (feather duster)																		
Sponge, tan encrusting																		
Actiniaria, brown																		
Cancer sp																		1
?Lytechinus pictus					1		1											
Crassadoma gigantea																		
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc # clumps																	1	1
Alga, small red foliose, col count				1														
Alga, encrusting green																		
Asterina miniata = Patiria miniata																		
Encruster - white																		
Encruster, red																		
Epiactis prolifera ?																		1
Hydroid, tan branching																		
Leucilla nuttingi (colonies)																		
Mytilidae, unid																		
Ophiacantha diplasia																		
Sebastes sp																		
Tunicate, encrusting tan																		
Ulva						1												

Platform Irene - Leg A1 counts																		
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00
PHOTO CODE	004irD	003irD	002irD	045ir1127	044ir1126	043ir1126	042ir1125	041ir1125	039ir1124	040ir1124	038ir1124	037ir1123	036ir1122	035ir1122	034ir1121	033ir1121	032ir1121	031ir1120
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	14	15	17	19	21	23	24	25	27	27.1	28	31	38	39	40	41	43	48
Metridium senile	300	350	300	400	380	330	375	370	380	380	425	250	200	250	240	255	150	400
Mytilus californianus	56	42	56	28	35	47	35	35	35	35	65	70						4
Tetraclita squamosa							7	8										
Balanus sp	14										1				2		3	2
Anthopleura elegantissima (rosy morph)	5					1	10	10	13	25	11	14	15		3			
Worm tubes, calcareous																	3	
Corynactis californica, individuals																		
Ophiothrix spiculata			3			3	5	2	3		3							
Mytilus													2			6		
Anthopleura sp (whitish, no rose)																		
Sponge, yellow encrusting											1						1	
Pisaster ochraceus							1	1	2	2	1	1	2	1				
Metridium, dark or Feather Duster																		
Cancer antennarius													1	2				
Metridium farcimen																		
Strongylocentrotus purpuratus			1															
Feather Duster Worm		3	2								3							
Pollicipes polymerus																		
Fuzz																		
Serpulidae (feather duster)																		
Sponge, tan encrusting											1		1		1		1	
Actiniaria, brown															2			2
Cancer sp													1		1			
?Lytechinus pictus																		
Crassadoma gigantea																		1
filamentous reds Polysiphonia, Neoptilota, Antithamion etc # clumps																		
Alga, small red foliose, col count															1			
Alga, encrusting green																		
Asterina miniata = Patiria miniata																		
Encruster - white																	1	
Encruster, red																		
Epiactis prolifera ?																		
Hydroid, tan branching																		
Leucilla nuttingi (colonies)																		
Mytilidae, unid																		
Ophiacantha diplasia												1						
Sebastes sp																		
Tunicate, encrusting tan															1			
Ulva																		

Platform Irene - Leg A1 counts																		
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00
PHOTO CODE	030ir1120	029ir1119	028ir1119	027ir1119	025ir1118	026ir1119	024ir1118	023ir1118	022ir1117	021ir1117	020ir1117	019ir1115	017ir1112	016ir1109	015ir1108	013ir1106	012ir1106	011ir1104
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	49	51	55	58	62	62.1	65	68	71	75	79	98	115	131	142	151	154	170
Metridium senile	500	510	430	375	400	390	425	430	430	330	370	400	400	370	400	375	405	405
Mytilus californianus	13	11																
Tetraclita squamosa																		
Balanus sp	4	6		9	17	14		22	16	34	15	7	4	2				
Anthopleura elegantissima (rosy morph)																		
Worm tubes, calcareous																		
Corynactis californica, individuals																		
Ophiothrix spiculata																		
Mytilus					3		6			2	4							
Anthopleura sp (whitish, no rose)																		
Sponge, yellow encrusting				1					1	1	1	1	1	1		1	1	1
Pisaster ochraceus																		
Metridium, dark or Feather Duster								1	13									
Cancer antennarius	3	2							1			1	3					
Metridium farcimen																		
Strongylocentrotus purpuratus																		
Feather Duster Worm																		
Pollicipes polymerus																		
Fuzz																		
Serpulidae (feather duster)												5						
Sponge, tan encrusting																		
Actiniaria, brown																		
Cancer sp																		
?Lytechinus pictus																		
Crassadoma gigantea													1					
filamentous reds Polysiphonia, Neoptilota, Antithamion etc # clumps																		
Alga, small red foliose, col count																		
Alga, encrusting green																		1
Asterina miniata = Patiria miniata																		
Encruster - white																		
Encruster, red							1											
Epiactis prolifera ?																		
Hydroid, tan branching	1																	
Leucilla nuttingi (colonies)																		
Mytilidae, unid												1						
Ophiacantha diplasia																		
Sebastes sp																		
Tunicate, encrusting tan																		
Ulva																		

Platform Irene - Leg A1 counts																
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00						
PHOTO CODE	010ir1104	009ir1103	008ir1101	007ir1100	006ir1057	004ir1056	005ir1056	003ir1054	002ir1052	001ir1049						
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			No. of			
DEPTH (ft)	173	179	182	189	201	206	206.1	215	221	232	Total	Average	Photos	Occurrence	Max	Min
Metridium senile	400	395	390	385	450	425	450	420	250	25	19522	330.8814	64	59	510	15
Mytilus californianus											1401	42.45455	64	33	124	4
Tetraclita squamosa											672	42	64	16	200	7
Balanus sp											190	10	64	19	34	1
Anthopleura elegantissima (rosy morph)											129	10.75	64	12	25	1
Worm tubes, calcareous										100	103	51.5	64	2	100	3
Corynactis californica, individuals											101	10.1	64	10	33	1
Ophiothrix spiculata											36	4	64	9	7	2
Mytilus											23	3.833333	64	6	6	2
Anthopleura sp (whitish, no rose)											22	22	64	1	22	22
Sponge, yellow encrusting	1	1	1	1	1	1	1				19	1	64	19	1	1
Pisaster ochraceus		1								3	15	1.5	64	10	3	1
Metridium, dark or Feather Duster											14	7	64	2	13	1
Cancer antennarius											13	1.857143	64	7	3	1
Metridium farcimen											12	12	64	1	12	12
Strongylocentrotus purpuratus											10	2	64	5	4	1
Feather Duster Worm											8	2.666667	64	3	3	2
Pollicipes polymerus											6	2	64	3	4	1
Fuzz											5	1	64	5	1	1
Serpulidae (feather duster)											5	5	64	1	5	5
Sponge, tan encrusting		1									5	1	64	5	1	1
Actiniaria, brown											4	2	64	2	2	2
Cancer sp											3	1	64	3	1	1
?Lytechinus pictus											2	1	64	2	1	1
Crassadoma gigantea											2	1	64	2	1	1
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc # clumps											2	1	64	2	1	1
Alga, small red foliose, col count											2	1	64	2	1	1
Alga, encrusting green											1	1	64	1	1	1
Asterina miniata = Patiria miniata										1	1	1	64	1	1	1
Encruster - white											1	1	64	1	1	1
Encruster, red											1	1	64	1	1	1
Epiactis prolifera ?											1	1	64	1	1	1
Hydroid, tan branching											1	1	64	1	1	1
Leucilla nuttingi (colonies)			1								1	1	64	1	1	1
Mytilidae, unid											1	1	64	1	1	1
Ophiacantha diplasia											1	1	64	1	1	1
Sebastes sp										1	1	1	64	1	1	1
Tunicate, encrusting tan											1	1	64	1	1	1
Ulva											1	1	64	1	1	1

Platform Irene - Leg A1 %																			
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00
PHOTO CODE	014irD	030irD	013irD	033irD	016irD	031irD	011irD	019irD	020irD	023irD	032irD	029irD	010irD	018irD	009irD	008irD	007irD	005irD	
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	
DEPTH (ft)	1	1.1	2	2.1	3	3.1	4	4.1	4.2	4.3	4.4	6	8	8.1	9	10	11	13	
Metridium senile %			75		25		33	15	5	30	3		50	70	40	80	75	75	
Tunicate, encrusting tan %																			
Tetraclita squamosa %	85	85	10	90	50	75	33	50	15	30	85	60	50	43					
Sponge, tan encrusting (%)																			
Mytilus californianus %	15	15	25	10	25	20	33	85	75	40	15	30	50	30	60	20	25	25	
Worm tubes, calcareous (%)																			
Sponge, gray encrusting %																		3	
Fuzz %	5	10				10					1				25				
Alga, encrusting green (%)																			
Anthopleura elegantissima (rosy morph) %									7								2		
Sponge, yellow encrusting (%)																			
Ulva %						3													
Encruster, red %																			
Encruster - white (%)																			
Hydroid, tan branching %																			
Leucilla nuttingi (colonies) (%)																			
cabie %																			

Platform Irene - Leg A1 %																		
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00
PHOTO CODE	004irD	003irD	002irD	045ir1127	044ir1126	043ir1126	042ir1125	041ir1125	039ir1124	040ir1124	038ir1124	037ir1123	036ir1122	035ir1122	034ir1121	033ir1121	032ir1121	031ir1120
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	14	15	17	19	21	23	24	25	27	27.1	28	31	38	39	40	41	43	48
Metridium senile %	60	70	60	80	75	66	75	75	75	75	85	50	40	50	50	50	30	80
Tunicate, encrusting tan %													50					
Tetraclita squamosa %						10	10											
Sponge, tan encrusting (%)										1		50			50		60	
Mytilus californianus %	40	30	40	20	25	33	25	25	25	25	20	50						2
Worm tubes, calcareous (%)																	1	
Sponge, gray encrusting %																50		20
Fuzz %																		
Alga, encrusting green (%)																		
Anthopleura elegantissima (rosy morph) %	2					0.5	3	3	4	10	4	5	5		1			
Sponge, yellow encrusting (%)											0.1						0.1	
Ulva %																		
Encruster, red %																		
Encruster - white (%)																	1	
Hydroid, tan branching %																		
Leucilla nuttingi (colonies) (%)																		
cabie %																		

Platform Irene - Leg A1 %																		
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00
PHOTO CODE	030ir1120	029ir1119	028ir1119	027ir1119	025ir1118	026ir1119	024ir1118	023ir1118	022ir1117	021ir1117	020ir1117	019ir1115	017ir1112	016ir1109	015ir1108	013ir1106	012ir1106	011ir1104
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1
DEPTH (ft)	49	51	55	58	62	62.1	65	68	71	75	79	98	115	131	142	151	154	170
Metridium senile %	90	90	86	75	80	80	85	85	85	66	75	80	80	75	80	75	80	80
Tunicate, encrusting tan %																		
Tetraclita squamosa %																		
Sponge, tan encrusting (%)																		
Mytilus californianus %	9	8																
Worm tubes, calcareous (%)																		
Sponge, gray encrusting %	10	5	15	10	20	20	15	15	15	30	25	15	20	25	20	25	15	19
Fuzz %																		
Alga, encrusting green (%)																		10
Anthopleura elegantissima (rosy morph) %																		
Sponge, yellow encrusting (%)				15					0.1	3	1	5	1	1		0.1	1	1
Ulva %																		
Encruster, red %							1											
Encruster - white (%)																		
Hydroid, tan branching %	1																	
Leucilla nuttingi (colonies) (%)																		
caable %																		

Platform Irene - Leg A1 %																
DATE	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00	11/4/00						
PHOTO CODE	010ir1104	009ir1103	008ir1101	007ir1100	006ir1057	004ir1056	005ir1056	003ir1054	002ir1052	001ir1049						
LEG	A1	A1	A1	A1	A1	A1	A1	A1	A1	A1			No. of			
DEPTH (ft)	173	179	182	189	201	206	206.1	215	221	232	Total	Average	Photos	Occurrence	Max	Min
Metridium senile %	80	80	80	80	90	85	90	85	50	5	3894	66	64	59	90	3
Tunicate, encrusting tan %											50	50	64	1	50	50
Tetraclita squamosa %											781	48.8125	64	16	90	10
Sponge, tan encrusting (%)		1									162	32.4	64	5	60	1
Mytilus californianus %											975	29.54545	64	33	85	2
Worm tubes, calcareous (%)										50	51	25.5	64	2	50	1
Sponge, gray encrusting %	15		2	10							419	17.45833	64	24	50	2
Fuzz %											51	10.2	64	5	25	1
Alga, encrusting green (%)											10	10	64	1	10	10
Anthopleura elegantissima (rosy morph) %											46.5	3.875	64	12	10	0.5
Sponge, yellow encrusting (%)	1	10	15	2	2	2	3				63.4	3.336842	64	19	15	0.1
Ulva %											3	3	64	1	3	3
Encruster, red %											1	1	64	1	1	1
Encruster - white (%)											1	1	64	1	1	1
Hydroid, tan branching %											1	1	64	1	1	1
Leucilla nuttingi (colonies) (%)			1								1	1	64	1	1	1
cable %				1							1	1	64	1	1	1

Diablo Rock and Nifty Rock - counts																
DATE	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98
PHOTO CODE	014drD	019drD	021drD	011drD	023drD	025drD	029drD	003drD2	006drD	031drD	033drD	035drD	012drD2	010drD2	008drD2	003drD
LEG	D frame	D no frame	D frame	D frame	D frame	D frame	D frame	D frame	D frame	D frame	D frame	D no frame	D frame	D no frame	D frame	D frame
DEPTH (ft)	25	25.1	25.2	35	35.1	35.2	35.3	40	45	45.1	45.2	45.3	45.4	48	50	55
Corynactis californica, individuals	10			25	50	250	50	40	100	165	125	250		48	50	55
Chthalamus sp.		4	3					47						34	27	54
Balanus sp.	60	2	5													
Anthopleura xanthogrammica		24	3	7		1										
Ophiothrix spiculata								21						31		
Mytilus californianus	31	10	4													
Anthopleura elegantissima (rosy morph)		30					7									
Metridium senile																
Balanophyllia																
Bossiella sp.		1	3			1						1				
Strongylocentrotus purpuratus	2	5	2	1				2	1			2	1	7		1
Dendrochirotrida								15					4	5		
Halocynthia igaboja										19	3					
Paracyathus stearnsi																
Anthopleura sp.	15							1					1			
Alga, encrusting (Lithothamnion)		1					1	1	1			1	1	1	1	1
Ophiuroid unid								1	1	11						1
Strongylocentrotus franciscanus							1					6	1			
Tube worm, single fan		1		1	4											
Worm tubes, calcareous									2				6			
Alga, green clump (Codium-like)																5
Tube worm, double spiral									2			4				
Turf													1			
Bryozoa, Staghorn, yellow													1			1
Urticina													3	2		
Alga, green clump								2					1		1	
Parastichopus californicus															4	
Hydrozoa tan clump																
Alga, brown, blades																
Flabellina iodinea					1											
Henricia leviuscula			1		1											
Tunicate, solitary																2
? Algae, brown, clump																1
Algae/Hydrozoa mix																
Cypraea spadicea																
Dorid, white											1					
Serpulorbis					1											
Sponge, gray encrusting		1														
Sponge, orange encrusting																1
Sponge, Orange round																
Sponge, unid			1													
Sponge, white finger											1					
Tunicate, globular									1							
Worm tubes, plain													1			

Diablo Rock and Nifty Rock - count												
DATE	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98						
PHOTO CODE	034nrD2	029nrD2	027nrD2	024nrD2	020nrD2	017nrD2						
LEG	N no frame	N no frame	N no frame	N no frame	N no frame	N no frame			No. of			
DEPTH (ft)	15	25	35	45	50	55	Total	Average	Photos	Occurrence	Max	Min
Corynactis californica, individuals		375	50	250	250		1982	132.1333	22	15	375	2
Chthalamus sp.			4		4	3	180	20	22	9	54	3
Balanus sp							67	22.33333	22	3	60	2
Anthopleura xanthogrammica	25						60	12	22	5	25	1
Ophiothrix spiculata							52	26	22	2	31	21
Mytilus californianus							45	15	22	3	31	4
Anthopleura elegantissima (rosy morph)							37	18.5	22	2	30	7
Metridium senile	33						33	33	22	1	33	33
Balanophyllia						31	31	31	22	1	31	31
Bossiella sp.	10			10			26	4.333333	22	6	10	1
Strongylocentrotus purpuratus	1						25	2.272727	22	11	7	1
Dendrochirotida							24	8	22	3	15	4
Halocynthia igaboja	2						24	8	22	3	19	2
Paracyathus stearnsi					1	21	22	11	22	2	21	1
Anthopleura sp.							17	5.666667	22	3	15	1
Alga, encrusting (Lithothamnion)	1	1	1	1		1	14	1	22	14	1	1
Ophiroid unid		1					14	3.5	22	4	11	1
Strongylocentrotus franciscanus			1			1	10	2	22	5	6	1
Tube worm, single fan	4						10	2.5	22	4	4	1
Worm tubes, calcareous							8	4	22	2	6	2
Alga, green clump (Codium-like)					1		6	3	22	2	5	1
Tube worm, double spiral							6	3	22	2	4	2
Turf	1	1	1		1	1	6	1	22	6	1	1
Bryozoa, Staghorn, yellow			1	1	1		5	1	22	5	1	1
Urticina							5	2.5	22	2	3	2
Alga, green clump							4	1.333333	22	3	2	1
Parastichopus californicus							4	4	22	1	4	4
Hydrozoa tan clump	1	2					3	1.5	22	2	2	1
Alga, brown, blades				1	1		2	1	22	2	1	1
Flabellina iodinea			1				2	1	22	2	1	1
Henricia leviuscula							2	1	22	2	1	1
Tunicate, solitary							2	2	22	1	2	2
? Algae, brown, clump							1	1	22	1	1	1
Algae/Hydrozoa mix					1		1	1	22	1	1	1
Cypraea spadicea	1						1	1	22	1	1	1
Dorid, white							1	1	22	1	1	1
Serpulorbis							1	1	22	1	1	1
Sponge, gray encrusting							1	1	22	1	1	1
Sponge, orange encrusting							1	1	22	1	1	1
Sponge, Orange round				1			1	1	22	1	1	1
Sponge, unid							1	1	22	1	1	1
Sponge, white finger							1	1	22	1	1	1
Tunicate, globular							1	1	22	1	1	1
Worm tubes, plain							1	1	22	1	1	1

Diablo Rock and Nifty Rock %																
DATE	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98
PHOTO CODE	014drD	019drD	021drD	011drD	023drD	025drD	029drD	003drD2	006drD	031drD	033drD	035drD	012drD2	010drD2	008drD2	003drD
LEG	D frame	D no frame	D frame	D frame	D frame	D frame	D frame	D frame	D frame	D frame	D frame	D no frame	D frame	D no frame	D frame	D frame
DEPTH (ft)	25	25.1	25.2	35	35.1	35.2	35.3	40	45	45.1	45.2	45.3	45.4	48	50	55
Sponge, unid (%)			50													
Encruster, all (%)			2		50						50					
Chthalamus sp. (%)		3	2					70						50	40	80
Corynactis californica (%)	2			5	10	50	10		20	33	25	50		0.5	6	
filamentous reds Polysiphonia, Neoptilota, Anthamion etc (%)	10	20	1	75		40	20	10	7	40	66			5	50	10
Alga, encrusting (Lithothamnion) %		10					5	10	60			0.5	5	25	50	5
Balanus sp (%)	60	2	2													
Foliose red algae (%)					20											
Turf (%)													10			
Alga, green clump (Codium-like) %																20
Ophiothrix spiculata (%)												20	5			
Shadow (%)				10												15
Bryozoa, Staghorn, yellow (%)													20			0.5
Foliose brown algae (%)					5		5									
Ophiuroid unid (%)					5		5									
Algae/Hydrozoa mix (%)																
Codium (%)					5											
Bossiella sp. (%)		0.5		3		1							1			
Alga, green foliose (%)											3					
Encruster - white (%)		2	5													
Anthopleura elegantissima (rosy morph) %		2					0.5									
Alga, brown, blades (%)																
Rock, bare (%)													1			
Sponge, orange encrusting %																1
Sponge, white finger (%)											1					
Encruster, green %								0.5								
Sponge, gray encrusting %		0.5														
Ulva (%)				0.1					0.1	1						
Encruster, red %																

Diablo Rock and Nifty Rock %												
DATE	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98	10/11/98						
PHOTO CODE	034nrD2	029nrD2	027nrD2	024nrD2	020nrD2	017nrD2						
LEG	N no frame	N no frame	N no frame	N no frame	N no frame	N no frame			No. of			
DEPTH (ft)	15	25	35	45	50	55	Total	Average	Photos	Occurrence	Max	Min
Sponge, unid (%)							50	50	22	1	50	50
Encruster, all (%)							102	34	22	3	50	2
Chthalamus sp. (%)			5		5	2	257	28.55556	22	9	80	2
Corynactis californica (%)		75	10	50	50		396.5	26.43333	22	15	75	0.5
filamentous reds Polysiphonia, Neoptilota, Antithamnion etc (%)		2	1	10		3	370	21.76471	22	17	75	1
Alga, encrusting (Lithothamnion) %	40	20	10	10		50	300.5	21.46429	22	14	60	0.5
Balanus sp (%)							64	21.33333	22	3	60	2
Foliose red algae (%)							20	20	22	1	20	20
Turf (%)	5	15	30		15	30	105	17.5	22	6	30	5
Alga, green clump (Codium-like) %					5		25	12.5	22	2	20	5
Ophiothrix spiculata (%)							25	12.5	22	2	20	5
Shadow (%)	5			15			45	11.25	22	4	15	5
Bryozoa, Staghorn, yellow (%)			10	10	5		45.5	9.1	22	5	20	0.5
Foliose brown algae (%)							10	5	22	2	5	5
Ophiuroid unid (%)							10	5	22	2	5	5
Algae/Hydrozoa mix (%)					5		5	5	22	1	5	5
Codium (%)							5	5	22	1	5	5
Bossiella sp. (%)	10			10			25.5	4.25	22	6	10	0.5
Alga, green foliose (%)	5						8	4	22	2	5	3
Encruster - white (%)		0.1				2	9.1	2.275	22	4	5	0.1
Anthopleura elegantissima (rosy morph) %							2.5	1.25	22	2	2	0.5
Alga, brown, blades (%)				1	1		2	1	22	2	1	1
Rock, bare (%)							1	1	22	1	1	1
Sponge, orange encrusting %							1	1	22	1	1	1
Sponge, white finger (%)							1	1	22	1	1	1
Encruster, green %			1			0.1	1.6	0.533333	22	3	1	0.1
Sponge, gray encrusting %							0.5	0.5	22	1	0.5	0.5
Ulva (%)							1.2	0.4	22	3	1	0.1
Encruster, red %						0.1	0.1	0.1	22	1	0.1	0.1

Appendix D
Scraping Data - Platforms Harvest and Gail

Appendix D has been organized into eight primary sections:

- Table D-1 – this two-page table summarizes the taxa identified during scraping analysis at both platforms Gail and Harvest.
- Platform Harvest, Taxa vs. Station (quadrat) Matrix – this five-page table summarizes the relative abundance of identified taxa from Harvest scraping samples. Taxa are organized by abundance (i.e., highest mean abundance) and frequency of occurrence.
- Platform Harvest, Taxa by Individual Station – this 17-page table lists all identifiable taxa and their relative abundance, by station (quadrat).
- Platform Harvest, Scraping Weight Summary – this two-page table summarizes total sample weight, mussel weight, non-mussel weight, and percent mussel (by weight) for each sample collected at Platform Harvest.
- Platform Harvest, Mussel Measurements – this 20-page table summarizes individual length, width, and height measurements and weights for the mussels collected from Platform Harvest.
- Platform Harvest, Mussel Measurement Statistics – this five-page table summarizes basic statistics (e.g., mean, mode, standard deviation) for the mussels collected from individual quadrats at Platform Harvest.
- Platform Gail, Taxa vs. Station (quadrat) Matrix – this two-page table summarizes the relative abundance of identified taxa from Gail scraping samples. Taxa are organized by abundance (i.e., highest mean abundance) and frequency of occurrence.
- Platform Gail, Taxa by Individual Station – this 16-page table lists all identifiable taxa and their relative abundance, by station (quadrat).

Table D-1. Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of platforms Gail and Harvest. Taxa common to both platforms denoted in bold.

<p>FLORA: Algae: <i>Acrosorium venulosum</i> <i>Antithamnion hubbsii</i> <i>Branchioglossum bipinnatifidum</i> <i>Callophyllis</i> spp. <i>Ceramium camouii</i> Delesseriaceae, unidentified <i>Heterosiphonia japonica?</i> ¹ <i>Membranoptera multiramosa</i> ² <i>Polysiphonia scopularum</i> <i>Pterosiphonia dendroidea</i> <i>Pugetia fragillissima</i> <i>Pugetia</i> spp. (juvenile) <i>Rhodymenia californica</i> <i>Rhodymenia pacifica</i></p> <p>FAUNA: Crustaceans: Barnacles (Cirripedia): <i>Balanus nubilus</i> <i>Balanus</i> spp. (juvenile) <i>Balanus trigonus</i> <i>Megabalanus californicus</i> <i>Tetraclita rubescens</i></p> <p>Caprellid amphipods: <i>Caprella alaskana</i> <i>Caprella equilibra</i> <i>Caprella ferrea</i> <i>Caprella verrucosa</i></p> <p>Gammarid amphipods: <i>Aoroides</i> spp. <i>Dulichieilla appendiculata</i> <i>Elasmopus</i> cf. <i>holgurus</i> <i>Elasmopus holgurus</i> <i>Ericthonius brasiliensis</i> <i>Gammaropsis thompsoni</i></p>	<p>Gammarid amphipods, continued: <i>Janiralata occidentalis</i> <i>Jassa slatteryi</i> <i>Leucothoe alata</i> <i>Monocorophium</i> spp. <i>Parapleustes pugettensis</i> <i>Podocerus brasiliensis</i> <i>Quadrimaera reishi</i> cf. <i>Sinocorophium</i> spp. <i>Stenothoe estacola</i></p> <p>Crabs (Brachyura, Cancridae): <i>Cancer branneri</i> <i>Cancer jordani</i> <i>Cancer productus</i> <i>Cancer</i> spp. (juvenile) <i>Maera simile</i> <i>Pachycheles pubescens</i> <i>Pachycheles rudis</i> <i>Pachygrapsus crassipes</i> <i>Paraxanthias taylori</i> <i>Pilumnus spinohirsutus</i> <i>Podocerus brasiliensis</i> <i>Scyra acutifrons</i></p> <p>Isopods (Isopoda): <i>Janiropsis tridens</i></p> <p>Sea spiders (Pycnogonida): <i>Anoplodactylus nodosus</i> Pycnogonida, unidentified (juvenile) <i>Pycnogonum stearnsi</i></p> <p>Mysids (Mysidacea): Mysidacea, unidentified (fragment)</p> <p>Echinoderms: Brittle stars (Ophiuroidea): <i>Ophiactis simplex</i> <i>Ophiopteris papillosa</i> <i>Ophiothrix spiculata</i> Ophiuroidea, unidentified (juvenile)</p>	<p>Holothuroids (Holothuroidea): Holothuroidea, unidentified Holothuroidea, unidentified (juvenile) <i>Parastichopus californicus</i> <i>Pentamera lissoplaca</i></p> <p>Urchins (Echinoidea): Echinoidea, unidentified (juvenile) <i>Lytechinus pictus</i> <i>Strongylocentrotus purpuratus</i></p> <p>Mollusks: Bivalves (Pelecypoda): <i>Anomia peruviana</i> <i>Chama arcana</i> <i>Crassadoma gigantea</i> <i>Crassostrea gigas</i> <i>Gregariella chenui</i> <i>Gregariella coarctata</i> <i>Hiatella arctica</i> <i>Irus lamellifer</i> <i>Kellia suborbicularis</i> <i>Lithophaga plumula</i> <i>Modiolus capax</i> <i>Mya arenaria</i> <i>Musculus (=Musculista) spp.</i> <i>Mytilus californianus</i> <i>Mytilus</i> spp. <i>Mytilus</i> spp. (juvenile) <i>Mytilus trossulus/galloprovincialis</i> <i>Ostrea conchaphila</i> <i>Petricola</i> spp. (juvenile) <i>Pododesmus cepio</i> <i>Pseudochama exogyra</i></p> <p>Gastropods (Gastropoda): <i>Amphissa reticulata</i> (dead) <i>Amphissa versicolor</i> <i>Anisodoris nobilis</i> Doridacea, unidentified <i>Iselica ovoidea</i></p>
--	--	---

Table D-1. Taxa identified during the analysis of scraping samples from the intertidal, barnacle, and mussel zones of Platforms Gail and Harvest. Taxa common to both platforms denoted in bold (continued).

<p>Gastropods (continued): <i>Iselica</i> spp. <i>Seila montereyensis</i> <i>Tritonia diomedea</i></p> <p>Chitons (Polyplacaphores): <i>Mopalia porifera</i></p> <p>Polychaetes: <i>Arabella iricolor</i> <i>Arabella semimaculata</i> <i>Brania</i> spp. <i>Cirratulus</i>, unidentified <i>Dodecaceria concharum</i> <i>Dodecaceria fewkesi</i> <i>Dodecaceria</i>, unidentified <i>Eudistylia polymorpha</i> <i>Halosydna brevisetosa</i> <i>Halosydna johnsoni</i> <i>Harmothoe ? hirsuta</i> <i>Harmothoe</i> spp. <i>Lepidonotus spiculus</i> <i>Myxicola</i> spp. <i>Naineris dendritica</i> <i>Nereis eakini</i> <i>Nereis mendocinana</i> <i>Nereis pelagica neonigripes</i> <i>Paleanotus bellis</i> <i>Pholoides asperus</i> <i>Phyllochaetopterus prolifica</i> <i>Phyllodoce medipapillata</i> <i>Phyllodoce</i> spp. <i>Polydora</i> spp. <i>Proceraea</i> cf. <i>kiiensis</i> <i>Proceraea</i> spp. Sabellidae, unidentified <i>Serpula columbiana</i> <i>Spirobranchus spinosus</i> Syllidae, unidentified <i>Syllis gracilis</i></p>	<p>Polychaetes (continued): <i>Trypanosyllis</i> spp. <i>Typosyllis</i> spp.</p> <p>Cnidarians: Anthozoans (Actiniaria): Actiniidae, unidentified <i>Anthopleura elegantissima</i> (rosy morph) <i>Anthopleura elegantissima</i> <i>Corynactis californica</i> <i>Diadumene cincta</i> <i>Metridium exilis</i> <i>Metridium senile</i></p> <p>Hydrozoans: <i>Campanularia</i> spp. Campanulariidae, unidentified <i>Eucopeella everta</i> <i>Filellum serpens</i> <i>Halecium</i> spp. <i>Halecium tenellum</i> <i>Lafoea adnata</i> <i>Obelia geniculata</i> <i>Obelia</i> nr. <i>surcularis</i> <i>Obelia plicata</i> <i>Obelia</i> spp. <i>Plumularia alicia</i> <i>Plumularia alicia</i> complex <i>Plumularia</i> nr. <i>septata</i> <i>Plumularia</i> spp. <i>Sertularella tenella</i> <i>Syncoryne eximia</i></p> <p>Minor Phyla: Bryozoans (Ectoprocta or Bryozoa): <i>Callopora</i> spp. <i>Celleporella</i> spp. <i>Celleporina</i> spp. <i>Costazia</i> spp. <i>Crisia</i> spp. Cyclostomata, unidentified</p>	<p>Bryozoans, continued: Ectoprocta, unidentified <i>Filicrisia</i> spp. <i>Scrupocellaria</i> spp. <i>Tegella</i> spp.</p> <p>Flatworms (Platyhelmenthes): Rhabdozoela, unidentified <i>Stylochoplana longipenis</i> <i>Stylochus</i> spp.</p> <p>Nemertean (Nemertea): <i>Amphiporus</i> spp. <i>Carinoma mutabilis</i> <i>Lineus rubescens</i> Nemertea, unidentified <i>Paranemertes californica</i> <i>Tetrastemma signifer</i></p> <p>Sipunculids (Sipunculida): <i>Phascolosoma agassizi</i></p> <p>Sponges (Porifera): <i>Haplosclerida</i> nr. <i>Haliclona</i> spp. Porifera sp. A Porifera, unidentified <i>Rhabdodermella nuttingi</i></p> <p>Tunicates (Urochordata, Ascidiacea): <i>Aplidium</i> spp. Aplousobranchia (Diplosoma), unidentified <i>Styela coriacea</i> <i>Styela truncata</i> Tunicate, unidentified</p> <p>Total: 181 taxonomic entries, including 123 monospecific taxa (68%)</p> <p>Footnotes: 1 - <i>Heterosiphonia japonica</i>? Yendo = <i>Heterosiphonia densiuscula</i> Kylin, per Miller (2004); 2 - <i>Membranoptera multimarosa</i> Gardner = <i>Membranoptera platylphylla</i> (Setchell & Gardner) Kylin, per Miller (2004).</p>
---	---	--

PLATFORM HARVEST - Taxa vs. All Stations/Quadrats																									
Species or Taxon																				Occurrence	Mean				
	HA-B1-B-47	HA-B1-B-54	HA-B1-B-78	HA-B1-B-79	HA-B1-M-18	HA-B1-M-20	HA-B1-M-24	HA-B1-M-25	HA-B1-M-28	HA-B1-M-30	HA-B1-M-32	HA-B1-M-40	HA-B2-B-47	HA-B2-B-50	HA-B2-B-60	HA-B2-M-11	HA-B2-M-13	HA-B2-M-14	HA-B2-M-15			HA-B2-M-17	HA-B2-M-19	HA-B2-M-21	HA-B2-M-22
<i>Erichthonius brasiliensis</i>	3	3	3	2										3	3									6	2.83
<i>Anthopleura elegantissima</i> (rosy form)											2					3	3	3	3	3		3		7	2.86
<i>Pododesmus cepio</i>	3	3	2	3	2	3		3	3		3	3	3		3	3				3			3	15	2.87
<i>Obelia geniculata</i>			2	2	3	3	3	3	3	3	3	3	3	3				3	3		3			16	2.88
<i>Pseudochama exogyra</i>	3			2	2	3		3	3	3	3	3	3	3	3	3		3		3	3		3	17	2.88
<i>Halosydna johnsoni</i>			2	3				3						3	3		3	3	3	3				9	2.89
<i>Balanus trigonus</i>		3		3		2	3						3	3		3	3		3	3			3	11	2.91
<i>Phyllodoce medipapillata</i>			2	3	3	3	3	3	3		3					3		3	3					11	2.91
<i>Filicrisia</i> sp	3	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	22	2.91
<i>Phascolosoma agassizi</i>			2	3		3			3	3	3			3	3	3		3	3	3	3			13	2.92
<i>Actiniidae</i> , juv								3																1	3.00
<i>Amphiporus</i> sp																3								1	3.00
<i>Anomia peruviana</i>																						3		1	3.00
<i>Anoplodactylus nodosus</i>																			3					1	3.00
<i>Arabella semimaculata</i>																3								1	3.00
<i>Balanus</i> sp juv														3										1	3.00
<i>Brania</i> sp.													3											1	3.00
<i>Cancer branneri</i>													3											1	3.00
<i>Cancer jordani</i>															3									1	3.00
<i>Cancer productus</i>											3													1	3.00
<i>Costazia</i> sp																3								1	3.00
<i>Crisia</i> sp																							3	1	3.00
<i>Dodecaceria fewkesi</i>												3												1	3.00
<i>Dodecaceria</i> unidentified						3																		1	3.00
Echinoidea juv																						3		1	3.00
Ectoprocta, unidentified							3																	1	3.00
<i>Eucopeia everta</i>																								1	3.00
<i>Eudistylia polymorpha</i>																3								1	3.00
Family Delesseriaceae					3																			1	3.00
<i>Gregariella chenui</i>				3																				1	3.00
<i>Halecium tenellum</i>																3								1	3.00

PLATFORM HARVEST - Taxa vs. All Stations/Quadrats													Occurrence	Mean											
Species or Taxon	HA-B1-B-47	HA-B1-B-54	HA-B1-B-78	HA-B1-B-79	HA-B1-M-18	HA-B1-M-20	HA-B1-M-24	HA-B1-M-25	HA-B1-M-28	HA-B1-M-30	HA-B1-M-32	HA-B1-M-40			HA-B2-B-47	HA-B2-B-50	HA-B2-B-60	HA-B2-M-11	HA-B2-M-13	HA-B2-M-14	HA-B2-M-15	HA-B2-M-17	HA-B2-M-19	HA-B2-M-21	HA-B2-M-22
Holothuroid, unid																					3			1	3.00
<i>Irus lamellifera</i>																	3							1	3.00
<i>Lafoea adnata</i>																	3							1	3.00
<i>Mopalia porifera</i>																							3	1	3.00
<i>Mya arenaria</i>																		3						1	3.00
<i>Mytilus</i> spp juv																	3							1	3.00
<i>Myxicola</i> sp.													3											1	3.00
Nemertea																						3		1	3.00
Nemertea unid																			3					1	3.00
<i>Obelia</i> sp																	3							1	3.00
<i>Paranemertes californica</i>																		3						1	3.00
<i>Pentamera lissoplaca</i>																			3					1	3.00
<i>Petricola</i> sp juv																	3							1	3.00
<i>Pholoides asperus</i>	3																							1	3.00
<i>Plumularia alicia</i> complex												3												1	3.00
<i>Plumularia nr septata</i>											3													1	3.00
Porifera																								1	3.00
<i>Rhabdodermella nuttingi</i>																	3							1	3.00
Sabellidae unidentified							3																	1	3.00
<i>Scrupocellaria</i> sp																				3				1	3.00
<i>Sertularella tenella</i>																	3							1	3.00
<i>Tetrastemma signifer</i>																								1	3.00
<i>Tritonia diomedea</i>																								1	3.00
Tunicate										3														1	3.00
<i>Aoroides</i> sp			3	3																				2	3.00
<i>Caprella ferrea</i>																	3	3						2	3.00
<i>Carinoma mutabilis</i>									3										3					2	3.00
Ectoprocta																			3	3				2	3.00
<i>Iselica ovoidea</i>																	3			3				2	3.00
<i>Paleanotus bellis</i>															3							3		2	3.00
<i>Parastichopus californicus</i>																	3		3					2	3.00

PLATFORM HARVEST - Taxa vs. All Stations/Quadrats														Occurrence	Mean												
Species or Taxon	HA-B1-B-47	HA-B1-B-54	HA-B1-B-78	HA-B1-B-79	HA-B1-M-18	HA-B1-M-20	HA-B1-M-24	HA-B1-M-25	HA-B1-M-28	HA-B1-M-30	HA-B1-M-32	HA-B1-M-40	HA-B2-B-47			HA-B2-B-50	HA-B2-B-60	HA-B2-M-11	HA-B2-M-13	HA-B2-M-14	HA-B2-M-15	HA-B2-M-17	HA-B2-M-19	HA-B2-M-21	HA-B2-M-22		
<i>Plumularia alicia</i>				3		3																			2	3.00	
<i>Plumularia</i> sp						3							3												2	3.00	
<i>Proceraea cf. kiiensis</i>													3					3							2	3.00	
<i>Rhabdochoela</i>																	3		3						2	3.00	
<i>Serpula columbiana</i>									3						3										2	3.00	
<i>Styela coriacea</i>							3									3									2	3.00	
<i>Tegella</i> sp.																						3	3		2	3.00	
<i>Amphissa versicolor</i>															3						3		3		3	3	3.00
<i>Chama arcana</i>			3					3					3												3	3	3.00
<i>Crassadoma gigantea</i>																3	3			3					3	3	3.00
<i>Janiralata occidentalis</i>			3	3															3						3	3	3.00
<i>Mytilus trossulus/gallo</i>							3	3								3									3	3	3.00
<i>Nereis eakini</i>								3				3							3						3	3	3.00
<i>Styela truncata</i>																3						3		3	3	3	3.00
<i>Stylochoplana longipenis</i>																3	3			3					3	3	3.00
<i>Stylochus</i> spp																3	3					3			3	3	3.00
<i>Anisodoris nobilis</i>						3													3	3		3			4	3	3.00
<i>Campanularia</i> sp																	3		3			3	3		4	3	3.00
<i>Pachycheles pubescens</i>					3		3	3	3																4	3	3.00
<i>Scyra acutifrons</i>													3				3	3			3				4	3	3.00
<i>Lepidonotus spiculus</i>											3			3	3				3	3					5	3	3.00
<i>Paraxanthias taylori</i>							3											3	3	3	3	3			5	3	3.00
Campanulariidae						3										3	3				3	3		3	6	3	3.00
<i>Cancer</i> sp juv						3		3	3				3								3		3		6	3	3.00
<i>Halecium</i> sp																3	3	3	3	3	3		3		6	3	3.00
<i>Lithophaga plumula</i>				3							3	3			3					3		3			6	3	3.00
<i>Spirobranchus spinosus</i>											3				3	3	3			3		3			6	3	3.00
<i>Callopora</i> sp					3											3	3			3	3	3		3	7	3	3.00
Cyclostomata														3		3	3	3	3	3	3	3		3	7	3	3.00
<i>Ophiopteris papillosa</i>															3	3	3	3	3	3	3	3			7	3	3.00
<i>Syncoryne eximia</i>					3	3		3			3			3		3				3					7	3	3.00

PLATFORM HARVEST - Taxa vs. All Stations/Quadrats																										
Species or Taxon																										
	HA-B1-B-47	HA-B1-B-54	HA-B1-B-78	HA-B1-B-79	HA-B1-M-18	HA-B1-M-20	HA-B1-M-24	HA-B1-M-25	HA-B1-M-28	HA-B1-M-30	HA-B1-M-32	HA-B1-M-40	HA-B2-B-47	HA-B2-B-50	HA-B2-B-60	HA-B2-M-11	HA-B2-M-13	HA-B2-M-14	HA-B2-M-15	HA-B2-M-17	HA-B2-M-19	HA-B2-M-21	HA-B2-M-22	Occurrence	Mean	
<i>Modiolus capax</i>				3			3		3		3					3	3		3			3	3	8	3.00	
<i>Celleporella</i> sp					3		3		3		3					3	3	3	3	3	3			10	3.00	
<i>Filellum serpens</i>								3	3							3	3	3	3	3	3	3	3	10	3.00	
<i>Pachycheles rudis</i>	3			3	3	3	3	3	3		3		3			3	3	3	3	3				14	3.00	
<i>Nereis pelagica neonigripes</i>		3		3	3		3				3	3	3	3	3	3	3	3	3	3	3		3	15	3.00	
<i>Kellia suborbicularis</i>		3	3	3	3	3	3			3	3	3	3	3	3	3			3	3	3		3	18	3.00	
Count:	18	25	28	36	32	36	33	37	32	25	36	29	34	32	37	63	51	46	54	37	41	20	31			

PLATFORM HARVEST - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
HA-B1-B-47	<i>Membranoptera multiramosa</i>	1		Key:
	<i>Metridium senile</i>	1		1 = abundant
	<i>Ophiothrix spiculata</i>	1		2 = moderately abundant
	Porifera sp A	1		3 = limited, sparse
	<i>Caprella alaskana</i>	2		
	<i>Elasmopus cf hologurus</i>	2		
	<i>Maera simile</i>	2		
	<i>Pycnogonum stearnsi</i>	2		
	<i>Balanus nubilus</i>	3		
	<i>Erichthonius brasiliensis</i>	3		
	<i>Filicrisia</i> sp	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Hiatella arctica</i>	3		
	<i>Pachycheles rudis</i>	3		
	<i>Pholoides asperus</i>	3		
	<i>Pododesmus cepio</i>	3		
	<i>Pseudochama exogyra</i>	3		
<i>Syllis gracilis</i>	3			
HA-B1-B-54	<i>Elasmopus cf hologurus</i>	1		
	<i>Metridium senile</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	Porifera sp A	1		
	<i>Caprella alaskana</i>	2		
	<i>Celleporina</i> sp	2		
	<i>Corynactis californica</i>	2		
	<i>Filicrisia</i> sp	2		
	<i>Maera simile</i>	2		
	<i>Pugetia fragillissima</i>	2		
	<i>Rhodymenia californica</i>	2		
	<i>Balanus nubilus</i>	3		
	<i>Balanus trigonus</i>	3		
	<i>Erichthonius brasiliensis</i>	3		
	<i>Hiatella arctica</i>	3		
	<i>Jassa slatteryi</i>	3		
	<i>Kellia suborbicularis</i>	3		
	<i>Megabalanus californicus</i>	3		
	<i>Nereis pelagica neonigripes</i>	3		
	<i>Phyllochaetopterus prolifica</i>	3		
<i>Podocerus brasiliensis</i>	3			
<i>Pododesmus cepio</i>	3			
<i>Pycnogonum stearnsi</i>	3			
<i>Stenothoe estacola</i>	3			
<i>Syllis gracilis</i>	3			
HA-B1-B-78	<i>Metridium senile</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Phyllochaetopterus prolifica</i>	1		
	<i>Syllis gracilis</i>	1		
	<i>Cirratulus</i> unidentified	2		

PLATFORM HARVEST - Taxa by Individual Station/Quadrat					
Station/Quadrat	Species or Taxon	Relative Abundance			
HA-B1-B-78	<i>Elasmopus cf hologurus</i>	2			
(continued)	<i>Filicrisia</i> sp	2			
	<i>Halosydna brevisetosa</i>	2			
	<i>Halosydna johnsoni</i>	2			
	<i>Jassa slatteryi</i>	2			
	<i>Maera simile</i>	2			
	<i>Obelia geniculata</i>	2			
	<i>Phascolosoma agassizi</i>	2			
	<i>Phyllodoce medipapillata</i>	2			
	<i>Pododesmus cepio</i>	2			
	Porifera sp A	2			
	<i>Aoroides</i> sp	3			
	<i>Balanus nubilus</i>	3			
	<i>Caprella alaskana</i>	3			
	<i>Chama arcana</i>	3			
	<i>Crassadoma gigantea</i>	3			
	<i>Erichthonius brasiliensis</i>	3			
	<i>Hiatella arctica</i>	3			
	<i>Janiralata occidentalis</i>	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Podocerus brasiliensis</i>	3			
	<i>Pycnogonum stearnsi</i>	3			
	<i>Stenothoe estacola</i>	3			
	<i>Typosyllis</i> spp.	3			
HA-B1-B-79	<i>Elasmopus cf hologurus</i>	1			
	<i>Metridium senile</i>	1			
	<i>Ophiothrix spiculata</i>	1			
	<i>Phyllochaetopterus prolifica</i>	1			
	<i>Syllis gracilis</i>	1			
	<i>Caprella alaskana</i>	2			
	<i>Erichthonius brasiliensis</i>	2			
	<i>Jassa slatteryi</i>	2			
	<i>Maera simile</i>	2			
	<i>Obelia geniculata</i>	2			
	<i>Podocerus brasiliensis</i>	2			
	Porifera sp A	2			
	<i>Pseudochama exogyra</i>	2			
	<i>Aoroides</i> sp	3			
	<i>Balanus trigonus</i>	3			
	<i>Caprella ferrea</i>	3			
	<i>Caprella verrucosa</i>	3			
	<i>Filicrisia</i> sp	3			
	<i>Gregariella chenui</i>	3			
	<i>Halosydna johnsoni</i>	3			
	<i>Hiatella arctica</i>	3			
	<i>Janiralata occidentalis</i>	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Lithophaga plumula</i>	3			

PLATFORM HARVEST - Taxa by Individual Station/Quadrat					
Station/Quadrat	Species or Taxon	Relative Abundance			
HA-B1-B-79	<i>Megabalanus californicus</i>	3			
(continued)	<i>Modiolus capax</i>	3			
	<i>Nereis pelagica neonigripes</i>	3			
	<i>Pachycheles rudis</i>	3			
	<i>Phascolosoma agassizi</i>	3			
	<i>Phyllodoce medipapillata</i>	3			
	<i>Plumularia alicia</i>	3			
	<i>Pododesmus cepio</i>	3			
	<i>Polydora</i> sp.	3			
	<i>Pycnogonum stearnsi</i>	3			
	<i>Stenothoe estacola</i>	3			
	<i>Typosyllis</i> spp.	3			
HA-B1-M-18	<i>Caprella alaskana</i>	1			
	<i>Metridium senile</i>	1			
	<i>Mytilus californianus</i>	1			
	<i>Ophiothrix spiculata</i>	1			
	<i>Rhodomenia californica</i>	1			
	<i>Caprella verrucosa</i>	2			
	<i>Elasmopus cf hologurus</i>	2			
	<i>Halosydna brevisetosa</i>	2			
	<i>Megabalanus californicus</i>	2			
	<i>Pododesmus cepio</i>	2			
	<i>Pseudochama exogyra</i>	2			
	<i>Pycnogonum stearnsi</i>	2			
	<i>Callopora</i> sp	3			
	<i>Celleporella</i> sp	3			
	Family Delesseriaceae	3			
	<i>Filicrisia</i> sp	3			
	<i>Hiatella arctica</i>	3			
	<i>Jassa slatteryi</i>	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Maera simile</i>	3			
	<i>Nereis pelagica neonigripes</i>	3			
	<i>Obelia geniculata</i>	3			
	<i>Pachycheles pubescens</i>	3			
	<i>Pachycheles rudis</i>	3			
	<i>Phyllochaetopterus prolifica</i>	3			
	<i>Phyllodoce medipapillata</i>	3			
	<i>Podocerus brasiliensis</i>	3			
	Porifera sp A	3			
	<i>Stenothoe estacola</i>	3			
	<i>Syllis gracilis</i>	3			
	<i>Syncoryne eximia</i>	3			
	<i>Typosyllis</i> spp.	3			
HA-B1-M-20	<i>Caprella alaskana</i>	1			
	<i>Hiatella arctica</i>	1			
	<i>Megabalanus californicus</i>	1			
	<i>Balanus nubilus</i>	2			

PLATFORM HARVEST - Taxa by Individual Station/Quadrat					
Station/Quadrat	Species or Taxon	Relative Abundance			
HA-B1-M-20	<i>Balanus trigonus</i>	2			
(continued)	<i>Caprella verrucosa</i>	2			
	<i>Elasmopus cf hologurus</i>	2			
	<i>Halosydna brevisetosa</i>	2			
	<i>Jassa slatteryi</i>	2			
	<i>Maera simile</i>	2			
	<i>Membranoptera multiramosa</i>	2			
	<i>Metridium senile</i>	2			
	<i>Ophiothrix spiculata</i>	2			
	<i>Phyllochaetopterus prolifica</i>	2			
	<i>Pycnogonum stearnsi</i>	2			
	<i>Rhodomenia californica</i>	2			
	<i>Stenothoe estacola</i>	2			
	<i>Syllis gracilis</i>	2			
	<i>Anisodoris nobilis</i>	3			
	Campanulariidae	3			
	<i>Cancer</i> sp juv	3			
	<i>Dodecaceria</i> unidentified	3			
	<i>Filicrisia</i> sp	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Mytilus californianus</i>	3			
	<i>Obelia geniculata</i>	3			
	<i>Pachycheles rudis</i>	3			
	<i>Phascolosoma agassizi</i>	3			
	<i>Phyllodoce medipapillata</i>	3			
	<i>Plumularia alicia</i>	3			
	<i>Plumularia</i> sp	3			
	<i>Podocerus brasiliensis</i>	3			
	<i>Pododesmus cepio</i>	3			
	Porifera sp A	3			
	<i>Pseudochama exogyra</i>	3			
	<i>Syncoryne eximia</i>	3			
HA-B1-M-24					
	<i>Megabalanus californicus</i>	1			
	<i>Ophiothrix spiculata</i>	1			
	<i>Caprella alaskana</i>	2			
	<i>Elasmopus cf hologurus</i>	2			
	<i>Halosydna brevisetosa</i>	2			
	<i>Jassa slatteryi</i>	2			
	<i>Maera simile</i>	2			
	<i>Membranoptera multiramosa</i>	2			
	<i>Mytilus</i> spp.	2			
	<i>Pycnogonum stearnsi</i>	2			
	<i>Rhodomenia californica</i>	2			
	<i>Rhodomenia pacifica</i>	2			
	<i>Syllis gracilis</i>	2			
	<i>Balanus nubilus</i>	3			
	<i>Balanus trigonus</i>	3			

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B1-M-24	<i>Caprella verrucosa</i>	3	
(continued)	Ectoprocta, unidentified	3	
	<i>Filicrisia</i> sp	3	
	<i>Hiatella arctica</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Metridium senile</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Mytilus trossulus/gallo</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Pachycheles pubescens</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Phyllodoce medipapillata</i>	3	
	Porifera sp A	3	
	Sabellidae unidentified	3	
	<i>Stenothoe estacola</i>	3	
	<i>Styela coriacea</i>	3	
HA-B1-M-25	<i>Megabalanus californicus</i>	1	
	<i>Mytilus</i> spp.	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Caprella alaskana</i>	2	
	<i>Caprella verrucosa</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Phyllochaetopterus prolifica</i>	2	
	<i>Podocerus brasiliensis</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	Actiniidae, juv	3	
	<i>Balanus nubilus</i>	3	
	<i>Cancer</i> sp juv	3	
	<i>Celleporella</i> sp	3	
	<i>Chama arcana</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Metridium senile</i>	3	
	<i>Modiolus capax</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Mytilus trossulus/gallo</i>	3	
	<i>Nereis eakini</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Pachycheles pubescens</i>	3	
	<i>Pachycheles rudis</i>	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B1-M-25	<i>Phyllodoce medipapillata</i>	3	
(continued)	<i>Pododesmus cepio</i>	3	
	Porifera sp A	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Stenothoe estacola</i>	3	
	<i>Syllis gracilis</i>	3	
	<i>Syncoryne eximia</i>	3	
HA-B1-M-28	<i>Ophiothrix spiculata</i>	1	
	<i>Phyllochaetopterus prolifica</i>	1	
	<i>Caprella alaskana</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Balanus nubilus</i>	3	
	<i>Cancer</i> sp juv	3	
	<i>Caprella verrucosa</i>	3	
	<i>Carinoma mutabilis</i>	3	
	<i>Celleporella</i> sp	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Hiatella arctica</i>	3	
	<i>Jassa slatteryi</i>	3	
	<i>Maera simile</i>	3	
	<i>Metridium senile</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Pachycheles pubescens</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Phascolosoma agassizii</i>	3	
	<i>Phyllodoce medipapillata</i>	3	
	<i>Podocerus brasiliensis</i>	3	
	<i>Pododesmus cepio</i>	3	
	<i>Polydora</i> sp.	3	
	Porifera sp A	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Pycnogonum stearnsi</i>	3	
	<i>Serpula columbiana</i>	3	
	<i>Syllis gracilis</i>	3	
	<i>Typosyllis</i> spp.	3	
HA-B1-M-30	<i>Caprella alaskana</i>	1	
	<i>Phyllochaetopterus prolifica</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Caprella verrucosa</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Metridium senile</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Balanus nubilus</i>	3	
	<i>Celleporina</i> sp	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat					
Station/Quadrat	Species or Taxon	Relative Abundance			
HA-B1-M-30	<i>Filellum serpens</i>	3			
(continued)	<i>Filicrisia</i> sp	3			
	<i>Hiatella arctica</i>	3			
	<i>Jassa slatteryi</i>	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Maera simile</i>	3			
	<i>Megabalanus californicus</i>	3			
	<i>Obelia geniculata</i>	3			
	<i>Ophiothrix spiculata</i>	3			
	<i>Pseudochama exogyra</i>	3			
	<i>Phascolosoma agassizi</i>	3			
	<i>Podocerus brasiliensis</i>	3			
	Porifera sp A	3			
	<i>Stenothoe estacola</i>	3			
	<i>Syllis gracilis</i>	3			
	Tunicate	3			
HA-B1-M-32	<i>Halosydna brevisetosa</i>	1			
	<i>Megabalanus californicus</i>	1			
	<i>Ophiothrix spiculata</i>	1			
	<i>Rhodymenia californica</i>	1			
	<i>Syllis gracilis</i>	1			
	<i>Anthopleura elegantissima</i> (rosy form)	2			
	<i>Caprella alaskana</i>	2			
	<i>Caprella verrucosa</i>	2			
	<i>Elasmopus cf hologurus</i>	2			
	<i>Jassa slatteryi</i>	2			
	<i>Metridium senile</i>	2			
	<i>Mytilus californianus</i>	2			
	<i>Phyllochaetopterus prolifica</i>	2			
	<i>Balanus nubilus</i>	3			
	<i>Celleporella</i> sp	3			
	<i>Filicrisia</i> sp	3			
	<i>Hiatella arctica</i>	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Lepidonotus spiculus</i>	3			
	<i>Lithophaga plumula</i>	3			
	<i>Maera simile</i>	3			
	<i>Modiolus capax</i>	3			
	<i>Nereis eakini</i>	3			
	<i>Nereis pelagica neonigripes</i>	3			
	<i>Obelia geniculata</i>	3			
	<i>Pachycheles rudis</i>	3			
	<i>Phascolosoma agassizii</i>	3			
	<i>Phyllodoce medipapillata</i>	3			
	<i>Plumularia nr septata</i>	3			
	<i>Podocerus brasiliensis</i>	3			
	<i>Pododesmus cepio</i>	3			
	Porifera sp A	3			

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B1-M-32	<i>Pseudochama exogyra</i>	3	
(continued)	<i>Pycnogonum stearnsi</i>	3	
	<i>Spirobranchus spinosus</i>	3	
	<i>Syncoryne eximia</i>	3	
HA-B1-M-40	<i>Megabalanus californicus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Syllis gracilis</i>	1	
	<i>Caprella alaskana</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Metridium senile</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Balanus nubilus</i>	3	
	<i>Cancer productus</i>	3	
	<i>Caprella verrucosa</i>	3	
	<i>Dodecaceria fewkesi</i>	3	
	<i>Filicrisia sp</i>	3	
	<i>Halosydna brevisetosa</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Lithophaga plumula</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Plumularia alicia complex</i>	3	
	<i>Podocerus brasiliensis</i>	3	
	<i>Pododesmus cepio</i>	3	
	Porifera sp A	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Stenothoe estacola</i>	3	
HA-B2-B-47	<i>Ophiothrix spiculata</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Syllis gracilis</i>	1	
	<i>Caprella alaskana</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Phyllochaetopterus prolifica</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Balanus nubilus</i>	3	
	<i>Balanus trigonus</i>	3	
	<i>Brania sp.</i>	3	
	<i>Cancer branneri</i>	3	
	<i>Cancer sp juv</i>	3	
	<i>Caprella verrucosa</i>	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-B-47	<i>Chama arcana</i>	3	
(continued)	<i>Filicrisia</i> sp	3	
	<i>Halosydna brevisetosa</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Megabalanus californicus</i>	3	
	<i>Metridium senile</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Myxicola</i> sp.	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Plumularia</i> sp	3	
	<i>Podocerus brasiliensis</i>	3	
	<i>Pododesmus cepio</i>	3	
	Porifera sp A	3	
	<i>Proceraea cf. kiiensis</i>	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Scyra acutifrons</i>	3	
HA-B2-B-50	<i>Membranoptera multiramosa</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Balanus nubilus</i>	2	
	<i>Caprella alaskana</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Metridium senile</i>	2	
	<i>Podocerus brasiliensis</i>	2	
	<i>Syllis gracilis</i>	2	
	<i>Balanus</i> sp juv	3	
	<i>Balanus trigonus</i>	3	
	<i>Cirratulus</i> unidentified	3	
	Cyclostomata	3	
	<i>Elasmopus cf hologurus</i>	3	
	<i>Erichthonius brasiliensis</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Lepidonotus spiculus</i>	3	
	<i>Megabalanus californicus</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Phascolosoma agassizi</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Polydora</i> sp.	3	
	Porifera sp A	3	
	<i>Pseudochama exogyra</i>	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-B-50	<i>Pycnogonum stearnsi</i>	3	
(continued)	<i>Stenothoe estacola</i>	3	
	<i>Syncoryne eximia</i>	3	
HA-B2-B-60	<i>Ophiothrix spiculata</i>	1	
	<i>Phyllochaetopterus prolifica</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Syllis gracilis</i>	1	
	<i>Balanus nubilus</i>	2	
	<i>Caprella alaskana</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Polydora</i> sp.	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Amphissa versicolor</i>	3	
	<i>Cancer jordani</i>	3	
	<i>Erichthonius brasiliensis</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halosydna brevisetosa</i>	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Lepidonotus spiculus</i>	3	
	<i>Lithophaga plumula</i>	3	
	<i>Metridium senile</i>	3	
	<i>Mytilus californianus</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Paleanotus bellis</i>	3	
	<i>Phascolosoma agassizi</i>	3	
	<i>Podocerus brasiliensis</i>	3	
	<i>Pododesmus cepio</i>	3	
	Porifera sp A	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Serpula columbiana</i>	3	
	<i>Spirobranchus spinosus</i>	3	
	<i>Stenothoe estacola</i>	3	
	<i>Typosyllis</i> spp.	3	
HA-B2-M-11	<i>Caprella alaskana</i>	1	
	<i>Halosydna brevisetosa</i>	1	
	<i>Hiatella arctica</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Metridium senile</i>	1	
	<i>Mytilus californianus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Typosyllis</i> spp.	1	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-M-11	<i>Anthopleura elegantissima</i>	2	
(continued)	<i>Balanus nubilus</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Stenothoe estacola</i>	2	
	<i>Tetraclita rubescens</i>	2	
	<i>Amphiporus</i> sp	3	
	<i>Anthopleura elegantissima</i> (rosy form)	3	
	<i>Arabella semimaculata</i>	3	
	<i>Balanus trigonus</i>	3	
	<i>Callopora</i> sp	3	
	Campanulariidae	3	
	<i>Caprella equilibra</i>	3	
	<i>Caprella ferrea</i>	3	
	<i>Caprella verrucosa</i>	3	
	<i>Celleporella</i> sp	3	
	<i>Costazia</i> sp	3	
	<i>Crassadoma gigantea</i>	3	
	Cyclostomata	3	
	<i>Eudistylia polymorpha</i>	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halecium</i> sp	3	
	<i>Halecium tenellum</i>	3	
	<i>Irus lamellifera</i>	3	
	<i>Iselica ovoidea</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Lafoea adnata</i>	3	
	<i>Modiolus capax</i>	3	
	<i>Mytilus</i> spp juv	3	
	<i>Mytilus trossulus/gallo</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia</i> sp	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Parastichopus californicus</i>	3	
	<i>Petricola</i> sp juv	3	
	<i>Phascolosoma agassizii</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Phyllodoce medipapillata</i>	3	
	<i>Podocerus brasiliensis</i>	3	
	<i>Pododesmus cepio</i>	3	
	Porifera sp A	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Rhabdodermella nuttingi</i>	3	
	<i>Sertularella tenella</i>	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-M-11	<i>Spirobranchus spinosus</i>	3	
(continued)	<i>Styela coriacea</i>	3	
	<i>Styela truncata</i>	3	
	<i>Stylochoplana longipenis</i>	3	
	<i>Stylochus</i> spp	3	
	<i>Syllis gracilis</i>	3	
	<i>Syncoryne eximia</i>	3	
HA-B2-M-13	<i>Caprella alaskana</i>	1	
	<i>Halosydna brevisetosa</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Mytilus californianus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Membranoptera multiramosa</i>	2	
	<i>Metridium senile</i>	2	
	<i>Pugetia fragillissima</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Stenothoe estacola</i>	2	
	<i>Anthopleura elegantissima</i> (rosy form)	3	
	<i>Balanus nubilus</i>	3	
	<i>Balanus trigonus</i>	3	
	<i>Callopora</i> sp	3	
	<i>Campanularia</i> sp	3	
	Campanulariidae	3	
	<i>Caprella ferrea</i>	3	
	<i>Caprella verrucosa</i>	3	
	<i>Celleporella</i> sp	3	
	<i>Corynactis californica</i>	3	
	<i>Crassadoma gigantea</i>	3	
	Cyclostomata	3	
	Echinoidea juv	3	
	<i>Eucopella everta</i>	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halecium</i> sp	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Modiolus capax</i>	3	
	<i>Mya arenaria</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Paranemertes californica</i>	3	
	<i>Podocerus brasiliensis</i>	3	
	Porifera	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-M-13	Porifera sp A	3	
(continued)	<i>Rhabdocoela</i>	3	
	<i>Scyra acutifrons</i>	3	
	<i>Spirobranchus spinosus</i>	3	
	<i>Stylochoplana longipenis</i>	3	
	<i>Stylochus</i> spp	3	
	<i>Tetraclita rubescens</i>	3	
	<i>Tetrastemma signifer</i>	3	
	<i>Tritonia diomedea</i>	3	
	<i>Typosyllis</i> spp.	3	
HA-B2-M-14	<i>Caprella alaskana</i>	1	
	<i>Metridium senile</i>	1	
	<i>Mytilus californianus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Caprella verrucosa</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Podocerus brasiliensis</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Rhodymenia pacifica</i>	2	
	<i>Stenothoe estacola</i>	2	
	<i>Anisodoris nobilis</i>	3	
	<i>Anthopleura elegantissima</i> (rosy form)	3	
	<i>Balanus nubilus</i>	3	
	<i>Carinoma mutabilis</i>	3	
	<i>Celleporella</i> sp	3	
	<i>Crassadoma gigantea</i>	3	
	Cyclostomata	3	
	Ectoprocta	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halecium</i> sp	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Janiralata occidentalis</i>	3	
	<i>Lepidonotus spiculus</i>	3	
	<i>Nereis eakini</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Parastichopus californicus</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Phascolosoma agassizi</i>	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-M-14	<i>Phyllochaetopterus prolifica</i>	3	
(continued)	<i>Phyllodoce medipapillata</i>	3	
	Porifera sp A	3	
	<i>Proceraea cf. kiiensis</i>	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Scyra acutifrons</i>	3	
	<i>Syllis gracilis</i>	3	
	<i>Tetraclita rubescens</i>	3	
	<i>Typosyllis</i> spp.	3	
HA-B2-M-15	<i>Caprella alaskana</i>	1	
	<i>Halosydna brevisetosa</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Metridium senile</i>	1	
	<i>Mytilus californianus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Balanus nubilus</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Maera simile</i>	2	
	<i>Phyllochaetopterus prolifica</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Typosyllis</i> spp.	2	
	<i>Anisodoris nobilis</i>	3	
	<i>Anoplodactylus nodosus</i>	3	
	<i>Anthopleura elegantissima</i> (rosy form)	3	
	<i>Balanus trigonus</i>	3	
	<i>Callopora</i> sp	3	
	<i>Campanularia</i> sp.	3	
	<i>Cancer</i> sp juv	3	
	<i>Caprella verrucosa</i>	3	
	<i>Celleporella</i> sp	3	
	<i>Cirratulus</i> unidentified	3	
	<i>Crassadoma gigantea</i>	3	
	Cyclostomata	3	
	Ectoprocta	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halecium</i> sp	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	<i>Iselica ovoidea</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Lepidonotus spiculus</i>	3	
	<i>Lithophaga plumula</i>	3	
	<i>Modiolus capax</i>	3	
	Nemertea unid	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-M-15	<i>Ophiopteris papillosa</i>	3	
(continued)	<i>Pachycheles rudis</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Pentamera lissoplaca</i>	3	
	<i>Phascolosoma agassizi</i>	3	
	<i>Phyllodoce medipapillata</i>	3	
	<i>Podocerus brasiliensis</i>	3	
	Porifera sp A	3	
	Rhabdocoela	3	
	<i>Scrupocellaria</i> sp	3	
	<i>Spirobranchus spinosus</i>	3	
	<i>Stenothoe estacola</i>	3	
	<i>Stylochoplana longipenis</i>	3	
	<i>Syllis gracilis</i>	3	
	<i>Syncoryne eximia</i>	3	
HA-B2-M-17	<i>Caprella alaskana</i>	1	
	<i>Halosydna brevisetosa</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Mytilus californianus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Rhodymenia californica</i>	1	
	<i>Elasmopus cf hologurus</i>	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Amphissa versicolor</i>	3	
	<i>Anthopleura elegantissima</i> (rosy form)	3	
	<i>Balanus trigonus</i>	3	
	<i>Callopora</i> sp	3	
	Campanulariidae	3	
	<i>Caprella verrucosa</i>	3	
	<i>Celleporella</i> sp	3	
	Cyclostomata	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halecium</i> sp	3	
	<i>Halosydna johnsoni</i>	3	
	<i>Hiatella arctica</i>	3	
	Holothuroid, unid	3	
	<i>Jassa slatteryi</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Maera simile</i>	3	
	<i>Metridium senile</i>	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Pachycheles rudis</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Phascolosoma agassizii</i>	3	
	<i>Pododesmus cepio</i>	3	
	Porifera sp A	3	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
HA-B2-M-17	<i>Pseudochama exogyra</i>	3	
(continued)	<i>Scyra acutifrons</i>	3	
	<i>Stenothoe estacola</i>	3	
	<i>Typosyllis</i> spp.	3	
HA-B2-M-19	<i>Caprella alaskana</i>	1	
	<i>Halosydna brevisetosa</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Mytilus californianus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Typosyllis</i> spp.	1	
	<i>Caprella verrucosa</i>	2	
	<i>Elasmopus cf hologurus</i>	2	
	Porifera sp A	2	
	<i>Pycnogonum stearnsi</i>	2	
	<i>Anisodoris nobilis</i>	3	
	<i>Balanus nubilus</i>	3	
	<i>Callopora</i> sp	3	
	<i>Campanularia</i> sp	3	
	Campanulariidae	3	
	<i>Cancer</i> sp juv	3	
	<i>Celleporella</i> sp	3	
	<i>Corynactis californica</i>	3	
	<i>Filellum serpens</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Hiatella arctica</i>	3	
	<i>Jassa slatteryi</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Lithophaga plumula</i>	3	
	<i>Maera simile</i>	3	
	<i>Metridium senile</i>	3	
	Nemertea	3	
	<i>Nereis pelagica neonigripes</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Paleanotus bellis</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Phascolosoma agassizii</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Pseudochama exogyra</i>	3	
	<i>Spirobranchus spinosus</i>	3	
	<i>Stenothoe estacola</i>	3	
	<i>Styela truncata</i>	3	
	<i>Stylochus</i> spp	3	
	<i>Syllis gracilis</i>	3	
	<i>Syncoryne eximia</i>	3	
HA-B2-M-21	<i>Caprella alaskana</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Mytilus californianus</i>	1	

PLATFORM HARVEST - Taxa by Individual Station/Quadrat					
Station/Quadrat	Species or Taxon	Relative Abundance			
HA-B2-M-21	<i>Ophiothrix spiculata</i>	1			
(continued)	<i>Elasmopus cf hologurus</i>	2			
	<i>Anomia peruviana</i>	3			
	<i>Anthopleura elegantissima</i> (rosy form)	3			
	<i>Campanularia</i> sp	3			
	<i>Caprella verrucosa</i>	3			
	Cyclostomata	3			
	<i>Filellum serpens</i>	3			
	<i>Halecium</i> sp	3			
	<i>Hiatella arctica</i>	3			
	<i>Jassa slatteryi</i>	3			
	<i>Metridium senile</i>	3			
	<i>Modiolus capax</i>	3			
	Porifera sp A	3			
	<i>Pycnogonum stearnsi</i>	3			
	<i>Stenothoe estacola</i>	3			
	<i>Tegella</i> sp.	3			
HA-B2-M-22	<i>Megabalanus californicus</i>	1			
	<i>Mytilus californianus</i>	1			
	<i>Ophiothrix spiculata</i>	1			
	<i>Caprella alaskana</i>	2			
	<i>Amphissa versicolor</i>	3			
	<i>Balanus nubilus</i>	3			
	<i>Balanus trigonus</i>	3			
	<i>Callopora</i> sp	3			
	Campanulariidae	3			
	<i>Caprella equilibra</i>	3			
	<i>Caprella verrucosa</i>	3			
	<i>Crisia</i> sp	3			
	<i>Elasmopus cf hologurus</i>	3			
	<i>Filellum serpens</i>	3			
	<i>Filicrisia</i> sp	3			
	<i>Halosydna brevisetosa</i>	3			
	<i>Hiatella arctica</i>	3			
	<i>Kellia suborbicularis</i>	3			
	<i>Maera simile</i>	3			
	<i>Modiolus capax</i>	3			
	<i>Mopalia porifera</i>	3			
	<i>Nereis pelagica neonigripes</i>	3			
	<i>Phyllochaetopterus prolifica</i>	3			
	<i>Podocerus brasiliensis</i>	3			
	<i>Pododesmus cepio</i>	3			
	<i>Pseudochama exogyra</i>	3			
	<i>Pycnogonum stearnsi</i>	3			
	<i>Stenothoe estacola</i>	3			
	<i>Styela truncata</i>	3			
	<i>Syllis gracilis</i>	3			
	<i>Typosyllis</i> spp.	3			

WEIGHTS - ALL SAMPLES:				
<i>Station/Quadrat</i>	<i>Total Weight (grams)</i>	<i>Mussel Weight (grams)</i>	<i>Non-Mussel Weight (grams)</i>	<i>Percent Mussel Weight</i>
HA-B1-B-47	909.00	0.00	909.00	0.0000
HA-B1-B-54	651.00	0.00	651.00	0.0000
HA-B1-B-78	1171.00	0.00	1171.00	0.0000
HA-B1-B-79	1335.00	0.00	1335.00	0.0000
HA-B1-M-18	5059.00	4025.00	1034.00	79.5612
HA-B1-M-20	149.10	1.65	147.45	1.1066
HA-B1-M-24	2916.00	589.00	2327.00	20.1989
HA-B1-M-25	3456.00	535.00	2921.00	15.4803
HA-B1-M-28	3615.00	266.00	3349.00	7.3582
HA-B1-M-30	1139.00	0.00	1139.00	0.0000
HA-B1-M-32	3493.00	906.00	2587.00	25.9376
HA-B1-M-40	1790.00	82.00	1708.00	4.5810
HA-B2-B-47	2828.10	7.10	2821.00	0.2511
HA-B2-B-50	2281.00	2.00	2279.00	0.0877
HA-B2-B-60	2944.80	0.80	2944.00	0.0272
HA-B2-M-11-BK34	6820.00	6114.00	706.00	89.6481
HA-B2-M-11-BK37	6024.00	4304.00	1720.00	71.4475
HA-B2-M-11-BK38	2465.00	1540.00	925.00	62.4746
HA-B2-M-11 total	15309.00	11958.00	3351.00	78.1109
HA-B2-M-13-BK14	3715.00	3267.00	448.00	87.9408
HA-B2-M-13-BK21	5328.00	3722.00	1606.00	69.8574
HA-B2-M-13-BK22	5387.00	4669.00	718.00	86.6716
HA-B2-M-13 total	14430.00	11658.00	2772.00	80.7900
HA-B2-M-14-BK19	114.16	56.39	57.77	49.3956
HA-B2-M-14-BK20	5769.00	3696.00	2073.00	64.0666
HA-B2-M-14 total	5883.16	3752.39	2130.77	63.7819
HA-B2-M-15-BK24	7148.00	6551.00	597.00	91.6480
HA-B2-M-15-BK35	5365.00	2920.00	2445.00	54.4268
HA-B2-M-15-BK36	5148.00	2465.00	2683.00	47.8827
HA-B2-M-15 total	17661.00	11936.00	5725.00	67.5839
HA-B2-M-17	7305.00	5843.00	1462.00	79.9863
HA-B2-M-19-BK14	6625.00	4745.00	1880.00	71.6226
HA-B2-M-19-BK15	6283.00	4345.00	1938.00	69.1549
HA-B2-M-19 total	20213.00	14933.00	5280.00	73.8782
HA-B2-M-21	5690.00	4941.00	749.00	86.8366
HA-B2-M-22	5440.00	4062.00	1378.00	74.6691

SUMMARY:				
Station/Quadrat	Total Weight (grams)	Mussel Weight (grams)	Non-Mussel Weight (grams)	Percent Mussel Weight
HA-B1-B-47	909.00	0.00	909.00	0.0000
HA-B1-B-54	651.00	0.00	651.00	0.0000
HA-B1-B-78	1171.00	0.00	1171.00	0.0000
HA-B1-B-79	1335.00	0.00	1335.00	0.0000
HA-B1-M-18	5059.00	4025.00	1034.00	79.5612
HA-B1-M-20	149.10	1.65	147.45	1.1066
HA-B1-M-24	2916.00	589.00	2327.00	20.1989
HA-B1-M-25	3456.00	535.00	2921.00	15.4803
HA-B1-M-28	3615.00	266.00	3349.00	7.3582
HA-B1-M-30	1139.00	0.00	1139.00	0.0000
HA-B1-M-32	3493.00	906.00	2587.00	25.9376
HA-B1-M-40	1790.00	82.00	1708.00	4.5810
HA-B2-B-47	2828.10	7.10	2821.00	0.2511
HA-B2-B-50	2281.00	2.00	2279.00	0.0877
HA-B2-B-60	2944.80	0.80	2944.00	0.0272
HA-B2-M-11	15309.00	11958.00	3351.00	78.1109
HA-B2-M-13	14430.00	11658.00	2772.00	80.7900
HA-B2-M-14	5883.16	3752.39	2130.77	63.7819
HA-B2-M-15	17661.00	11936.00	5725.00	67.5839
HA-B2-M-17	7305.00	5843.00	1462.00	79.9863
HA-B2-M-19	20213.00	14933.00	5280.00	73.8782
HA-B2-M-21	5690.00	4941.00	749.00	86.8366
HA-B2-M-22	5440.00	4062.00	1378.00	74.6691
Total - Both Legs:	125668.16	75497.94	50170.22	--
Mean:	5463.83	3282.52	2181.31	33.05
Maximum:	20213.00	14933.00	5725.00	86.84
Minimum:	149.10	0.00	147.45	0.00
Total - Leg B1:	25683.10	6404.65	19278.45	--
Mean:	2140.26	533.72	1606.54	12.85
Maximum:	5059.00	4025.00	3349.00	79.56
Minimum:	149.10	0.00	147.45	0.00
Total - Leg B2:	99985.06	69093.29	30891.77	--
Mean:	9089.55	6281.21	2808.34	55.09
Maximum:	20213.00	14933.00	5725.00	86.84
Minimum:	2281.00	0.80	749.00	0.03

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B1-M-18 (BK4)	16.4	6.2	6.4	322
HA-B1-M-18 (BK4)	18.9	7.9	7.7	466
HA-B1-M-18 (BK4)	13.4	6.1	4.5	129
HA-B1-M-18 (BK4)	17.6	7.3	6.8	296
HA-B1-M-18 (BK4)	18	7	7.4	437
HA-B1-M-18 (BK4)	12.6	5.7	4.4	114
HA-B1-M-18 (BK4)	11.6	4.2	4	86
HA-B1-M-18 (BK4)	10.7	5.2	3.6	89
HA-B1-M-18 (BK4)	11.1	6.4	4	88
HA-B1-M-18 (BK4)	11.4	5.6	4.4	90
HA-B1-M-18 (BK4)	10.9	5.5	4.6	75
HA-B1-M-18 (BK4)	10.8	5.2	3.9	68
HA-B1-M-18 (BK4)	9.9	5	3.5	67
HA-B1-M-18 (BK4)	9.4	5.2	3.6	62
HA-B1-M-18 (BK4)	8.3	4.2	2.9	35
HA-B1-M-18 (BK4)	8.4	4.7	3.3	45
HA-B1-M-18 (BK4)	7.9	4	3	35
HA-B1-M-18 (BK4)	7.9	3.9	2.5	31
HA-B1-M-18 (BK4)	7.9	4.3	3.2	40
HA-B1-M-18 (BK4)	6.1	4.1	2.4	24
HA-B1-M-18 (BK4)	5.9	3.2	2.1	18
HA-B1-M-18 (BK4)	5.4	3.1	2.2	16
HA-B1-M-18 (BK4)	3.6	2.2	1.4	6
HA-B1-M-18 (BK4)	5.9	3	2.3	16
HA-B1-M-18 (BK4)	5.8	3.7	2.4	22
HA-B1-M-18 (BK4)	14.6	6.2	4.5	147
HA-B1-M-18 (BK4)	10.4	5.1	3.5	13
HA-B1-M-18 (BK4)	10	4.5	3.7	67
HA-B1-M-18 (BK4)	8.6	4.4	3.2	49
HA-B1-M-18 (BK4)	10	5.2	3.7	68
HA-B1-M-18 (BK4)	9.4	4.9	3.7	60
HA-B1-M-18 (BK4)	8.9	4.6	3	45
HA-B1-M-18 (BK4)	8.3	4.7	2.9	36
HA-B1-M-18 (BK4)	7.4	3.7	2.6	29
HA-B1-M-18 (BK4)	7.2	4.2	2.7	34
HA-B1-M-18 (BK4)	5.6	3.4	2	15
HA-B1-M-18 (BK4)	5.5	2.7	2.3	13
HA-B1-M-18 (BK4)	6.6	4.2	2.6	28
HA-B1-M-18 (BK4)	5.7	3.3	2.3	13
HA-B1-M-18 (BK4)	4.4	2.7	1.6	9
HA-B1-M-18 (BK4)	4.9	2.9	1.6	12
HA-B1-M-18 (BK4)	5.4	2.9	1.9	14
HA-B1-M-18 (BK4)	3.9	2.4	1.4	6
HA-B1-M-18 (BK4)	3.5	1.9	1.4	5
HA-B1-M-18 (BK4)	3.4	2.8	1.1	3
HA-B1-M-18 (BK4)	2.9	1.5	0.9	2
HA-B1-M-18 (BK4)	2.9	1.7	1.1	3
HA-B1-M-18 (BK4)	2.7	1.5	1	3

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B1-M-18 (BK4)	2.4	1.5	0.9	2
HA-B1-M-18 (BK4)	2.3	1.3	0.8	2
HA-B1-M-18 (BK4)	2.4	1.4	0.8	2
HA-B1-M-18 (BK4)	2.3	1.4	0.9	1
HA-B1-M-18 (BK4)	1.9	1.4	0.7	1
HA-B1-M-18 (BK4)	1.9	1.1	0.7	0.1
HA-B1-M-18 (BK4)	2	1.4	0.7	1
HA-B1-M-18 (BK4)	1.6	1.2	0.6	0.1
HA-B1-M-18 (BK4)	1.5	1	0.6	0.1
HA-B1-M-18 (BK4)	1.6	1.2	0.6	1
HA-B1-M-18 (BK4)	1.5	1	0.6	1
HA-B1-M-18 (BK4)	1.4	1.1	0.5	0.1
HA-B1-M-18 (BK4)	8.3	4.2	3.1	42
HA-B1-M-18 (BK4)	8.4	4.2	3.2	46
HA-B1-M-18 (BK4)	8.3	4.4	3.7	47
HA-B1-M-20 (BK5)	7.4	3.8	2.6	29
HA-B1-M-20 (BK5)	4.9	2.5	1.7	10
HA-B1-M-20 (BK5)	3.3	2.2	1.7	4
HA-B1-M-20 (BK5)	0.9	0.5	0.3	0.1
HA-B1-M-24 (BK?)	9.7	5.4	4.2	84
HA-B1-M-24 (BK?)	11	5.3	4.5	126
HA-B1-M-24 (BK?)	10.2	5.8	4.3	109
HA-B1-M-24 (BK?)	8.1	4.3	3.1	47
HA-B1-M-24 (BK?)	6.3	3.3	2.1	23
HA-B1-M-24 (BK?)	6.6	3.7	2.5	28
HA-B1-M-24 (BK?)	5.4	3.1	2.1	16
HA-B1-M-24 (BK?)	5.4	3.1	2.5	23
HA-B1-M-24 (BK?)	4.4	2.5	1.9	13
HA-B1-M-24 (BK?)	3	1.9	1.5	4
HA-B1-M-24 (BK?)	3.3	1.6	1.2	4
HA-B1-M-24 (BK?)	3.1	1.7	1.2	4
HA-B1-M-24 (BK?)	2.9	1.5	1.1	2
HA-B1-M-24 (BK?)	2.2	1.4	0.9	2
HA-B1-M-24 (BK?)	2.4	1.8	1	2
HA-B1-M-24 (BK?)	1.9	1.4	1	1
HA-B1-M-24 (BK?)	1.8	1.3	0.7	1
HA-B1-M-24 (BK?)	1.7	1.5	1.1	3
HA-B1-M-24 (BK?)	1.9	1	0.7	1
HA-B1-M-24 (BK?)	1.6	1.2	1.1	2
HA-B1-M-24 (BK?)	1.6	1.4	1.2	2
HA-B1-M-24 (BK?)	1.5	1	1	1
HA-B1-M-24 (BK?)	0.7	0.9	1.1	0.1
HA-B1-M-24 (BK?)	0.8	0.8	0.5	0.1
HA-B1-M-24 (BK?)	0.8	0.8	0.4	0.1
HA-B1-M-24 (BK?)	0.7	0.7	0.4	0.1

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B1-M-25 (BK?)	14.9	6.6	5.5	186
HA-B1-M-25 (BK?)	9.4	4.7	3.4	56
HA-B1-M-25 (BK?)	7.5	4.7	2.4	27
HA-B1-M-25 (BK?)	8.4	4.6	3.3	48
HA-B1-M-25 (BK?)	8.3	4.1	2.9	41
HA-B1-M-25 (BK?)	6.9	3.6	2.4	24
HA-B1-M-25 (BK?)	5.3	2.8	1.8	14
HA-B1-M-25 (BK?)	5.5	3	2.2	16
HA-B1-M-25 (BK?)	5.3	3.1	1.9	13
HA-B1-M-25 (BK?)	5.5	3	2.2	16
HA-B1-M-25 (BK?)	4.4	2.5	1.8	11
HA-B1-M-25 (BK?)	4.2	2	1.4	8
HA-B1-M-25 (BK?)	4.2	2.5	1.7	8
HA-B1-M-25 (BK?)	3.4	1.9	1.1	4
HA-B1-M-25 (BK?)	3.1	1.8	1	2
HA-B1-M-25 (BK?)	2.3	1.5	0.8	1
HA-B1-M-25 (BK?)	2.1	1.3	0.9	1
HA-B1-M-25 (BK?)	1.6	1	0.6	1
HA-B1-M-25 (BK?)	1.4	0.9	0.5	0.1
HA-B1-M-25 (BK?)	1.5	0.9	0.6	1
HA-B1-M-25 (BK?)	1.7	1.2	0.6	1
HA-B1-M-25 (BK?)	1.4	1.1	0.6	0.1
HA-B1-M-32 (BK?)	15	7	5.2	200
HA-B1-M-32 (BK?)	8.4	3.9	2.6	35
HA-B1-M-32 (BK?)	8	4.5	2.8	38
HA-B1-M-32 (BK?)	6.5	4.2	2.6	31
HA-B1-M-32 (BK?)	7.4	4.1	2.5	29
HA-B1-M-32 (BK?)	7.8	5	3.2	49
HA-B1-M-32 (BK?)	6.4	3.9	2.4	27
HA-B1-M-32 (BK?)	6.4	3.3	2	19
HA-B1-M-32 (BK?)	5.7	2.7	2	15
HA-B1-M-32 (BK?)	4.9	3.2	2.2	13
HA-B1-M-32 (BK?)	5.7	2.7	1.9	14
HA-B1-M-32 (BK?)	4.5	2.4	1.7	9
HA-B1-M-32 (BK?)	4.7	2.4	1.9	12
HA-B1-M-32 (BK?)	4.9	2.6	1.7	11
HA-B1-M-32 (BK?)	2.8	1.6	0.9	2
HA-B1-M-32 (BK?)	2.2	1.2	0.8	1
HA-B1-M-32 (BK?)	2.1	1.2	0.9	1
HA-B1-M-32 (BK?)	1.7	0.9	0.7	0.1
HA-B1-M-32 (BK?)	1.7	1	0.6	0.1
HA-B1-M-32 (BK?)	1.6	0.9	0.5	1
HA-B2-M-11 (BK34)	22.4	8.2	6.4	418
HA-B2-M-11 (BK34)	18.6	7.7	7	327
HA-B2-M-11 (BK34)	15.5	6.7	5.7	221
HA-B2-M-11 (BK34)	18.5	7.2	6.2	324

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-11 (BK34)	16	6.8	5.9	151
HA-B2-M-11 (BK34)	16.7	7	5.9	180
HA-B2-M-11 (BK34)	13.8	5.1	5	167
HA-B2-M-11 (BK34)	13.9	5.8	4.5	133
HA-B2-M-11 (BK34)	12.4	6.5	4.5	158
HA-B2-M-11 (BK34)	12.1	5.9	4.4	113
HA-B2-M-11 (BK34)	12.6	5.8	4.6	118
HA-B2-M-11 (BK34)	11.5	5.3	3.8	77
HA-B2-M-11 (BK34)	10.3	4.7	3.7	69
HA-B2-M-11 (BK34)	9.7	4.7	3.5	38
HA-B2-M-11 (BK34)	9	4.4	3.2	34
HA-B2-M-11 (BK34)	8.9	4.1	3.2	40
HA-B2-M-11 (BK34)	8.7	4.4	3.2	39
HA-B2-M-11 (BK34)	7.9	4.4	2.7	25
HA-B2-M-11 (BK34)	7.4	3.6	2.6	26
HA-B2-M-11 (BK34)	6.6	3.5	2.3	21
HA-B2-M-11 (BK34)	7.7	3.6	2.6	21
HA-B2-M-11 (BK34)	6.4	3.2	2.3	20
HA-B2-M-11 (BK34)	13.9	6.5	5.3	230
HA-B2-M-11 (BK34)	14.7	6.3	5.5	188
HA-B2-M-11 (BK34)	13.9	6.5	5.3	230
HA-B2-M-11 (BK34)	13.4	5.8	4.6	160
HA-B2-M-11 (BK34)	11.7	5.6	3.3	103
HA-B2-M-11 (BK34)	11.5	5.1	3.6	71
HA-B2-M-11 (BK34)	9.4	4.9	3	51
HA-B2-M-11 (BK34)	8.5	4.2	3.1	42
HA-B2-M-11 (BK34)	7.9	3.8	2.8	30
HA-B2-M-11 (BK34)	8.4	4.4	2.9	44
HA-B2-M-11 (BK34)	8.2	4	2.8	42
HA-B2-M-11 (BK34)	7.4	4	2.4	26
HA-B2-M-11 (BK34)	7.7	3.9	2.6	27
HA-B2-M-11 (BK34)	8.9	4.4	2.9	50
HA-B2-M-11 (BK34)	6.9	4	2.3	20
HA-B2-M-11 (BK34)	6.8	3.3	2.1	19
HA-B2-M-11 (BK34)	8.1	3.8	2.7	31
HA-B2-M-11 (BK34)	6.5	3.5	2.1	23
HA-B2-M-11 (BK34)	6.6	3.1	2.3	18
HA-B2-M-11 (BK34)	6	2.9	1.9	19
HA-B2-M-11 (BK34)	5.9	3.4	2	15
HA-B2-M-11 (BK34)	5.3	2.8	1.8	12
HA-B2-M-11 (BK34)	4.9	2.5	1.7	9
HA-B2-M-11 (BK34)	6	2.4	1.8	10
HA-B2-M-11 (BK34)	4.4	2.1	1.7	7
HA-B2-M-11 (BK34)	4.6	2.5	1.6	9
HA-B2-M-11 (BK34)	4.9	2.7	1.7	9
HA-B2-M-11 (BK34)	4.7	2.4	1.8	9
HA-B2-M-11 (BK34)	4.4	2.4	1.4	7
HA-B2-M-11 (BK34)	4.7	2.3	1.7	9

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-11 (BK34)	4	2.3	1.2	6
HA-B2-M-11 (BK34)	3.9	2.1	1.2	5
HA-B2-M-11 (BK34)	4.6	2.5	1.5	9
HA-B2-M-11 (BK34)	4	2.3	1.2	6
HA-B2-M-11 (BK34)	3.9	2.1	1.2	5
HA-B2-M-11 (BK34)	3.4	1.9	1.1	2
HA-B2-M-11 (BK34)	3.4	1.9	1.1	3
HA-B2-M-11 (BK34)	3.3	1.6	1	3
HA-B2-M-11 (BK34)	3.4	2	1.4	4
HA-B2-M-11 (BK34)	2.9	1.7	1	1
HA-B2-M-11 (BK34)	2.9	1.6	1	3
HA-B2-M-11 (BK34)	2.5	1.5	0.9	2
HA-B2-M-11 (BK34)	2.7	1.4	0.9	2
HA-B2-M-11 (BK34)	2.7	1.6	0.9	2
HA-B2-M-11 (BK34)	2.4	1.3	0.8	1
HA-B2-M-11 (BK34)	2.4	1.3	0.7	2
HA-B2-M-11 (BK34)	2.2	1.3	0.7	2
HA-B2-M-11 (BK34)	2	1.2	0.7	1
HA-B2-M-11 (BK34)	1.9	1	0.7	0.1
HA-B2-M-11 (BK34)	1.9	1.1	0.7	0.1
HA-B2-M-11 (BK34)	11.4	5.6	4	104
HA-B2-M-11 (BK37)	17.6	6.7	5.5	246
HA-B2-M-11 (BK37)	18.6	7.2	7.1	310
HA-B2-M-11 (BK37)	14.5	6.5	4.6	154
HA-B2-M-11 (BK37)	16.4	6.8	5.3	186
HA-B2-M-11 (BK37)	17.5	6.9	4.8	188
HA-B2-M-11 (BK37)	15.1	6.9	5.2	179
HA-B2-M-11 (BK37)	22	7.5	7.5	634
HA-B2-M-11 (BK37)	18.8	6.4	6.2	328
HA-B2-M-11 (BK37)	13.7	6.6	4.4	134
HA-B2-M-11 (BK37)	11.7	5.2	4	97
HA-B2-M-11 (BK37)	12.7	5.6	3.9	96
HA-B2-M-11 (BK37)	21.5	7.5	7.5	524
HA-B2-M-11 (BK37)	16.9	7.1	5.5	272
HA-B2-M-11 (BK37)	12.8	5.8	4.2	110
HA-B2-M-11 (BK37)	14.5	5.7	5	169
HA-B2-M-11 (BK37)	11.4	4.9	3.8	26
HA-B2-M-11 (BK37)	10.1	5	3.2	55
HA-B2-M-11 (BK37)	9.4	4.3	2.8	43
HA-B2-M-11 (BK37)	8.5	4.5	2.8	44
HA-B2-M-11 (BK37)	9.4	4.2	2.8	42
HA-B2-M-11 (BK37)	8.1	3.9	2.8	38
HA-B2-M-11 (BK37)	5.4	2.9	1.7	14
HA-B2-M-11 (BK37)	4.9	3	1.8	13
HA-B2-M-11 (BK37)	4	2.2	1.2	8
HA-B2-M-11 (BK37)	4	2.2	1.3	8
HA-B2-M-11 (BK37)	2.8	1.4	0.9	4
HA-B2-M-11 (BK37)	2.5	1.4	0.9	3

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-11 (BK37)	2.8	1.7	0.8	4
HA-B2-M-11 (BK37)	2.1	1.1	0.7	4
HA-B2-M-11 (BK37)	2.1	1	0.8	5
HA-B2-M-11 (BK37)	1.8	1.1	0.6	3
HA-B2-M-11 (BK37)	1.8	0.9	0.6	3
HA-B2-M-11 (BK37)	1.3	0.8	0.4	2
HA-B2-M-11 (BK37)	1.3	0.8	0.5	2
HA-B2-M-11 (BK38)	18.4	7.7	6.2	326
HA-B2-M-11 (BK38)	21.1	8.1	7	458
HA-B2-M-11 (BK38)	15.2	7.1	4.9	211
HA-B2-M-11 (BK38)	16.8	6.8	5.5	271
HA-B2-M-11 (BK38)	19.6	7.5	7	407
HA-B2-M-11 (BK38)	14.4	6.4	4.9	159
HA-B2-M-11 (BK38)	12.4	5.8	4.1	90
HA-B2-M-11 (BK38)	14	6	4.8	175
HA-B2-M-11 (BK38)	15.1	6.3	4.8	186
HA-B2-M-11 (BK38)	12	5.5	3.8	104
HA-B2-M-11 (BK38)	12.7	5.7	4.1	119
HA-B2-M-11 (BK38)	11.6	5.7	3.6	81
HA-B2-M-11 (BK38)	8.9	4.1	2.9	41
HA-B2-M-11 (BK38)	10.1	4.8	3.3	56
HA-B2-M-11 (BK38)	10.3	4.9	3.3	54
HA-B2-M-11 (BK38)	10.7	5.1	3.5	59
HA-B2-M-11 (BK38)	9.2	4.5	3.1	77
HA-B2-M-11 (BK38)	8.9	4.5	2.9	43
HA-B2-M-11 (BK38)	10.2	4.9	3.5	58
HA-B2-M-11 (BK38)	7.7	4.1	2.3	30
HA-B2-M-11 (BK38)	7.5	4.3	3.4	49
HA-B2-M-11 (BK38)	8.6	4.4	3.2	46
HA-B2-M-11 (BK38)	7.8	4.8	2.7	35
HA-B2-M-11 (BK38)	7.1	3.6	2.3	29
HA-B2-M-11 (BK38)	7.6	3.9	2.6	31
HA-B2-M-11 (BK38)	6.8	3.8	2.8	33
HA-B2-M-11 (BK38)	6.6	3.7	2.4	25
HA-B2-M-11 (BK38)	6.6	3.3	2	18
HA-B2-M-11 (BK38)	5.6	2.8	2	14
HA-B2-M-11 (BK38)	5.6	2.8	1.8	12
HA-B2-M-11 (BK38)	4.3	2.1	1.5	7
HA-B2-M-11 (BK38)	3.2	2.1	1	3
HA-B2-M-11 (BK38)	3.9	2.2	1.2	5
HA-B2-M-11 (BK38)	2.8	1.5	0.9	2
HA-B2-M-11 (BK38)	2.8	1.5	1	2
HA-B2-M-11 (BK38)	1.3	1.3	0.8	1
HA-B2-M-11 (BK38)	2.2	1.3	0.8	4
HA-B2-M-11 (BK34)	8.2	4	2.8	42
HA-B2-M-11 (BK34)	5.2	2.8	1.9	9
HA-B2-M-11 (BK34)	5.1	3.1	2.1	14
HA-B2-M-11 (BK34)	5.3	2.4	1.8	12

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-11 (BK34)	5.9	2.9	1.9	13
HA-B2-M-13 (BK?)	14.1	6.2	5	143
HA-B2-M-13 (BK?)	14.9	6	5.4	153
HA-B2-M-13 (BK?)	11.4	6.2	5	116
HA-B2-M-13 (BK?)	10.8	4.9	3.6	69
HA-B2-M-13 (BK?)	10	5.3	3.6	70
HA-B2-M-13 (BK?)	11	5.3	3.5	69
HA-B2-M-13 (BK?)	10.9	5	3.8	67
HA-B2-M-13 (BK?)	8.9	4	2.9	40
HA-B2-M-13 (BK?)	8.4	4.2	2.9	37
HA-B2-M-13 (BK?)	9.3	4.6	3.8	66
HA-B2-M-13 (BK?)	7.8	3.9	2.4	29
HA-B2-M-13 (BK?)	8	3.6	2.2	28
HA-B2-M-13 (BK?)	5.6	3.3	2.2	17
HA-B2-M-13 (BK?)	6.6	3.7	2.5	22
HA-B2-M-13 (BK14)	20.4	7.4	7.2	491
HA-B2-M-13 (BK14)	20.3	7.6	7.3	513
HA-B2-M-13 (BK14)	20.3	7.5	6.6	374
HA-B2-M-13 (BK14)	18.7	7	4.8	310
HA-B2-M-13 (BK14)	18.5	6.5	5.1	206
HA-B2-M-13 (BK14)	15.5	6.7	5.1	179
HA-B2-M-13 (BK14)	16	7.3	5.1	212
HA-B2-M-13 (BK14)	14.1	5.8	4.4	125
HA-B2-M-13 (BK21)	21.8	8.6	6.8	459
HA-B2-M-13 (BK21)	20.4	6.9	7.3	447
HA-B2-M-13 (BK21)	17.1	7.2	5.8	280
HA-B2-M-13 (BK21)	17.3	6.9	5.9	263
HA-B2-M-13 (BK21)	14.6	6.2	4.8	145
HA-B2-M-13 (BK21)	14.4	6.4	4.7	162
HA-B2-M-13 (BK21)	11.3	6.6	5.1	219
HA-B2-M-13 (BK21)	15.1	6.5	4.9	227
HA-B2-M-13 (BK21)	12.1	5.8	4.1	91
HA-B2-M-13 (BK21)	12.5	5.7	3.8	101
HA-B2-M-13 (BK21)	11.4	4.9	4	84
HA-B2-M-13 (BK21)	12.6	5.3	4.1	109
HA-B2-M-13 (BK21)	11.3	5	3.4	70
HA-B2-M-13 (BK21)	11.2	6.1	4.3	94
HA-B2-M-13 (BK21)	8.8	4	3	38
HA-B2-M-13 (BK21)	11.7	5	4.2	98
HA-B2-M-13 (BK21)	9.7	5.2	3.2	58
HA-B2-M-13 (BK21)	11.6	5.8	4.3	99
HA-B2-M-13 (BK21)	10.2	5.1	3.7	67
HA-B2-M-13 (BK21)	9	4.2	2.8	40
HA-B2-M-13 (BK21)	8.5	4.5	2.9	45
HA-B2-M-13 (BK21)	6.5	3.2	2.1	16
HA-B2-M-13 (BK21)	6.1	3.2	2.1	11
HA-B2-M-13 (BK21)	9.8	4.6	3.1	50

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-13 (BK21)	7.6	4.1	2.4	30
HA-B2-M-13 (BK21)	4.8	2.4	1.6	9
HA-B2-M-13 (BK21)	4.4	2.3	1.5	8
HA-B2-M-13 (BK21)	4.5	2.4	1.5	7
HA-B2-M-13 (BK21)	3.7	1.9	1.1	4
HA-B2-M-13 (BK21)	4.4	2.2	1.3	7
HA-B2-M-13 (BK21)	3.2	1.6	1	2
HA-B2-M-13 (BK21)	3.1	1.7	1.1	2
HA-B2-M-13 (BK21)	2.8	1.4	0.9	2
HA-B2-M-13 (BK21)	2.4	1.3	0.9	2
HA-B2-M-13 (BK21)	2.5	1.4	1	2
HA-B2-M-13 (BK21)	2.3	1.3	0.7	1
HA-B2-M-13 (BK21)	1.7	1	0.6	1
HA-B2-M-13 (BK21)	1.9	1	0.6	0.1
HA-B2-M-13 (BK21)	1.9	0.8	0.7	0.1
HA-B2-M-13 (BK21)	1.9	1.2	0.7	0.1
HA-B2-M-13 (BK21)	1.6	0.9	0.5	0.1
HA-B2-M-13 (BK22)	21.9	9.1	8.2	928
HA-B2-M-13 (BK22)	20.9	7.2	8.8	782
HA-B2-M-13 (BK22)	22.4	7.3	7.3	626
HA-B2-M-13 (BK22)	18.8	7.1	5.6	267
HA-B2-M-13 (BK22)	15.7	7	5.6	253
HA-B2-M-13 (BK22)	16.7	6.3	5.5	212
HA-B2-M-13 (BK22)	18.4	6.7	5.8	304
HA-B2-M-13 (BK22)	17.4	7.3	5.7	296
HA-B2-M-13 (BK22)	12.4	5.5	4.2	102
HA-B2-M-13 (BK22)	9.8	4.6	3.1	49
HA-B2-M-13 (BK22)	9.7	4.6	3.3	56
HA-B2-M-13 (BK22)	7.8	4.2	2.7	34
HA-B2-M-13 (BK22)	7.6	3.6	2.5	27
HA-B2-M-13 (BK22)	9.1	4.4	3.4	52
HA-B2-M-13 (BK22)	8	3.9	2.7	30
HA-B2-M-13 (BK22)	8.4	4.4	3	43
HA-B2-M-13 (BK22)	9.5	4.4	3.1	51
HA-B2-M-13 (BK22)	7.7	4.5	3.5	49
HA-B2-M-13 (BK22)	7.7	3.9	2.6	31
HA-B2-M-13 (BK22)	7.1	3.6	2.1	24
HA-B2-M-13 (BK22)	7.6	3.9	2.3	32
HA-B2-M-13 (BK22)	7.3	3.8	2	24
HA-B2-M-13 (BK22)	8.9	5	3	45
HA-B2-M-13 (BK22)	7.4	3.6	2.5	27
HA-B2-M-13 (BK22)	7.1	3.6	2.3	23
HA-B2-M-13 (BK22)	8.1	4.1	3	38
HA-B2-M-13 (BK22)	7.9	4.2	2.6	30
HA-B2-M-13 (BK22)	6.4	3.6	2.5	24
HA-B2-M-13 (BK22)	6.6	3.1	2	20
HA-B2-M-13 (BK22)	7.1	3.6	2.3	25
HA-B2-M-13 (BK22)	6.1	3	1.9	15

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-13 (BK22)	6.4	3.9	2	20
HA-B2-M-13 (BK22)	5.6	3	1.9	13
HA-B2-M-13 (BK22)	3.4	1.7	1.1	4
HA-B2-M-13 (BK22)	3.3	1.7	1.2	4
HA-B2-M-13 (BK22)	3.6	1.9	1.2	5
HA-B2-M-13 (BK22)	1.9	1.2	7	1
HA-B2-M-13 (BK22)	8.3	4.7	3.4	69
HA-B2-M-13 (BK22)	8.9	4.4	3	43
HA-B2-M-14 (BK19)	19.9	7.9	7.9	536
HA-B2-M-14 (BK19)	20	8.3	6.5	442
HA-B2-M-14 (BK19)	19.1	7.9	6.3	443
HA-B2-M-14 (BK19)	10.4	5.2	4	83
HA-B2-M-14 (BK19)	10.7	5.5	3.7	80
HA-B2-M-14 (BK19)	10.2	5.1	3.5	88
HA-B2-M-14 (BK19)	9.8	4.8	3.8	67
HA-B2-M-14 (BK19)	8.1	4.4	3	43
HA-B2-M-14 (BK19)	8.2	4.2	2.5	31
HA-B2-M-14 (BK19)	8.7	4.6	3	45
HA-B2-M-14 (BK19)	8.2	4.5	2.9	40
HA-B2-M-14 (BK19)	7.2	4.1	2.6	38
HA-B2-M-14 (BK19)	6.3	2.9	2.2	17
HA-B2-M-14 (BK19)	5.7	3.5	2.3	21
HA-B2-M-14 (BK19)	5.9	3.4	1.9	19
HA-B2-M-14 (BK19)	5.2	2.9	1.7	15
HA-B2-M-14 (BK19)	5.9	3.2	1.9	18
HA-B2-M-14 (BK19)	4.9	2.4	1.4	10
HA-B2-M-14 (BK19)	5.1	2.9	1.7	13
HA-B2-M-14 (BK19)	3	1.5	1	7
HA-B2-M-14 (BK19)	2.4	1.4	0.9	1
HA-B2-M-14 (BK19)	2.5	1.3	0.8	1
HA-B2-M-14 (BK19)	2.2	1.1	0.7	1
HA-B2-M-14 (BK20)	21.7	7.1	8.6	716
HA-B2-M-14 (BK20)	21.4	9.2	6.5	461
HA-B2-M-14 (BK20)	19.9	8.3	6.7	423
HA-B2-M-14 (BK20)	18.4	8.4	6.8	425
HA-B2-M-14 (BK20)	17.8	8.6	6.8	400
HA-B2-M-14 (BK20)	16.4	7	5.8	226
HA-B2-M-14 (BK20)	14.4	6.9	4.9	220
HA-B2-M-14 (BK20)	11.9	5.8	4.3	114
HA-B2-M-14 (BK20)	10.4	5.4	3.7	75
HA-B2-M-14 (BK20)	10.4	5.5	4.1	87
HA-B2-M-14 (BK20)	8.8	4.5	2.6	40
HA-B2-M-14 (BK20)	8.4	4.6	3	46
HA-B2-M-14 (BK20)	7.6	3.6	2.7	30
HA-B2-M-14 (BK20)	6.6	3.5	2.3	20
HA-B2-M-14 (BK20)	5.4	2.9	1.7	11
HA-B2-M-14 (BK20)	5.1	2.7	1.8	10

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-14 (BK20)	4.5	2.6	2.1	11
HA-B2-M-14 (BK20)	5.3	2.6	1.7	12
HA-B2-M-14 (BK20)	3.9	2.1	1.2	5
HA-B2-M-14 (BK20)	3.3	1.8	1	3
HA-B2-M-14 (BK20)	3.2	1.6	1	3
HA-B2-M-14 (BK20)	2.9	1.8	1	2
HA-B2-M-14 (BK20)	3.1	2.1	1.1	3
HA-B2-M-14 (BK20)	2.1	1.3	0.3	1
HA-B2-M-14 (BK20)	2	1.1	0.6	1
HA-B2-M-14 (BK20)	1.9	1.2	0.6	1
HA-B2-M-14 (BK20)	1.2	0.6	0.4	1
HA-B2-M-15 (BK24)	18.1	7.9	6.2	294
HA-B2-M-15 (BK24)	18.7	7.2	6.5	355
HA-B2-M-15 (BK24)	15.8	6.6	5.7	212
HA-B2-M-15 (BK24)	14.7	5.9	4.9	166
HA-B2-M-15 (BK24)	14.7	6.6	6	206
HA-B2-M-15 (BK24)	16.1	6.7	5.9	228
HA-B2-M-15 (BK24)	15.1	6.3	4.6	160
HA-B2-M-15 (BK24)	13.5	6	4.5	120
HA-B2-M-15 (BK24)	13.2	5.8	4.3	134
HA-B2-M-15 (BK24)	12	5.8	4.1	108
HA-B2-M-15 (BK24)	11.4	5.2	3.4	81
HA-B2-M-15 (BK24)	10.4	4.8	3.2	62
HA-B2-M-15 (BK24)	8.6	4.3	3	41
HA-B2-M-15 (BK24)	7.9	3.9	2.7	32
HA-B2-M-15 (BK24)	11.4	5.7	3.9	83
HA-B2-M-15 (BK24)	11.8	5.3	3.8	102
HA-B2-M-15 (BK24)	12.2	5.8	4.2	99
HA-B2-M-15 (BK24)	17.6	7.5	5.9	283
HA-B2-M-15 (BK24)	11.1	5.5	3.5	75
HA-B2-M-15 (BK24)	11	5.9	3.7	94
HA-B2-M-15 (BK24)	10.9	4.6	3.8	68
HA-B2-M-15 (BK24)	10.6	4.7	3.6	63
HA-B2-M-15 (BK24)	8.7	4.3	2.9	36
HA-B2-M-15 (BK24)	8.4	4.7	3.4	55
HA-B2-M-15 (BK24)	7.5	4	2.2	25
HA-B2-M-15 (BK24)	8.1	3.8	2.7	33
HA-B2-M-15 (BK24)	7.3	3.8	2.2	23
HA-B2-M-15 (BK24)	6.8	3.8	2.3	21
HA-B2-M-15 (BK24)	6.9	3.4	2.4	20
HA-B2-M-15 (BK24)	6.9	3.1	2.5	20
HA-B2-M-15 (BK24)	7	3.7	2.4	28
HA-B2-M-15 (BK24)	7.1	3.7	2.8	34
HA-B2-M-15 (BK24)	8.1	4.3	2.8	2.8
HA-B2-M-15 (BK24)	6	3.4	2.4	21
HA-B2-M-15 (BK24)	6.1	3.3	2	16
HA-B2-M-15 (BK24)	6.4	3.9	2.4	18

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-15 (BK24)	5.9	3.1	1.8	11
HA-B2-M-15 (BK24)	5.4	2.7	2	12
HA-B2-M-15 (BK24)	5.4	3.1	1.9	12
HA-B2-M-15 (BK24)	5	3	1.6	11
HA-B2-M-15 (BK24)	5	2.3	1.9	12
HA-B2-M-15 (BK24)	4.5	2.5	1.8	10
HA-B2-M-15 (BK24)	5.3	3	2	12
HA-B2-M-15 (BK24)	4.6	2.6	1.5	8
HA-B2-M-15 (BK24)	4.9	2.6	2	12
HA-B2-M-15 (BK24)	5	2.7	1.7	14
HA-B2-M-15 (BK24)	4.7	2.5	1.6	8
HA-B2-M-15 (BK24)	4.9	3	2	14
HA-B2-M-15 (BK24)	4.4	2.3	1.4	5
HA-B2-M-15 (BK24)	4.4	2.4	1.4	7
HA-B2-M-15 (BK24)	4.2	2.6	1.8	8
HA-B2-M-15 (BK24)	3.4	1.7	1.3	4
HA-B2-M-15 (BK24)	3.4	1.8	1.2	3
HA-B2-M-15 (BK24)	3.2	1.7	1.1	3
HA-B2-M-15 (BK24)	3.3	1.6	1.3	3
HA-B2-M-15 (BK24)	2.9	1.6	1.1	3
HA-B2-M-15 (BK24)	3.4	1.8	1.2	4
HA-B2-M-15 (BK24)	2.9	1.6	1	2
HA-B2-M-15 (BK24)	2.8	1.3	0.9	2
HA-B2-M-15 (BK24)	2.4	1.4	0.9	2
HA-B2-M-15 (BK24)	1.7	1	0.6	0.1
HA-B2-M-15 (BK35)	19.6	7.1	8.8	723
HA-B2-M-15 (BK35)	19.9	7	7.7	898
HA-B2-M-15 (BK35)	10.9	5	3.6	91
HA-B2-M-15 (BK35)	11.9	6	4	98
HA-B2-M-15 (BK35)	14.5	6.2	5.2	198
HA-B2-M-15 (BK35)	13.5	6.3	4.6	176
HA-B2-M-15 (BK35)	16.4	7.2	5.3	290
HA-B2-M-15 (BK35)	13.9	5.9	4.9	150
HA-B2-M-15 (BK35)	11.6	5.6	3.6	81
HA-B2-M-15 (BK35)	13.4	6	4.6	153
HA-B2-M-15 (BK35)	12	5.7	4.2	108
HA-B2-M-15 (BK35)	10.4	4.9	3.3	71
HA-B2-M-15 (BK35)	8.9	4.2	2.8	37
HA-B2-M-15 (BK35)	8.7	4.6	4.1	49
HA-B2-M-15 (BK35)	8.9	4.4	2.8	41
HA-B2-M-15 (BK35)	8.9	4.5	3.2	55
HA-B2-M-15 (BK35)	10.4	5.1	3.1	63
HA-B2-M-15 (BK35)	9.4	4.7	3.2	55
HA-B2-M-15 (BK35)	8.1	4	2.8	35
HA-B2-M-15 (BK35)	6.5	3.5	2.5	23
HA-B2-M-15 (BK35)	6.8	3.6	2.5	28
HA-B2-M-15 (BK35)	7.3	3.7	2.2	25
HA-B2-M-15 (BK35)	8.7	4.3	2.9	41

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-15 (BK35)	7.8	3.8	2.8	35
HA-B2-M-15 (BK35)	6.4	4.1	2.8	26
HA-B2-M-15 (BK35)	7.5	3.5	2.3	22
HA-B2-M-15 (BK35)	7.4	3.8	2.3	24
HA-B2-M-15 (BK35)	6.6	3.5	2.6	22
HA-B2-M-15 (BK35)	7.7	3.7	2.7	29
HA-B2-M-15 (BK35)	7.5	3.5	3	33
HA-B2-M-15 (BK35)	7.2	3.5	2.3	24
HA-B2-M-15 (BK35)	6.1	3.5	2.4	23
HA-B2-M-15 (BK35)	6.9	3.5	2.1	20
HA-B2-M-15 (BK35)	6.2	3.3	2.3	16
HA-B2-M-15 (BK35)	5.9	3	2.4	21
HA-B2-M-15 (BK35)	6.4	3.1	2.2	11
HA-B2-M-15 (BK35)	6.9	3.3	2.5	25
HA-B2-M-15 (BK35)	4.1	3.1	2	16
HA-B2-M-15 (BK35)	5.9	2.8	2	14
HA-B2-M-15 (BK35)	5.6	3.3	2	14
HA-B2-M-15 (BK35)	6.4	3.3	1.9	16
HA-B2-M-15 (BK35)	5.3	2.8	2	13
HA-B2-M-15 (BK35)	5.4	2.9	1.8	13
HA-B2-M-15 (BK35)	5.4	2.8	1.8	12
HA-B2-M-15 (BK35)	5.1	3	1.8	11
HA-B2-M-15 (BK35)	5.1	2.9	1.8	11
HA-B2-M-15 (BK35)	3.9	2.1	1.2	4
HA-B2-M-15 (BK35)	2.9	1.6	1	2
HA-B2-M-15 (BK35)	3.8	2.1	1.5	7
HA-B2-M-15 (BK35)	2.4	1.4	0.9	2
HA-B2-M-15 (BK35)	3.8	2	1.4	5
HA-B2-M-15 (BK35)	6.3	3	2	16
HA-B2-M-15 (BK35)	4.7	2.7	1.7	10
HA-B2-M-15 (BK35)	4.4	2.4	1.4	6
HA-B2-M-15 (BK35)	3.4	2.8	1.2	3
HA-B2-M-15 (BK35)	4.9	2.9	2.3	15
HA-B2-M-15 (BK35)	3.9	2.3	1.2	4
HA-B2-M-15 (BK35)	2.9	1.7	1.1	2
HA-B2-M-15 (BK35)	4.9	2.4	1.8	11
HA-B2-M-15 (BK35)	5.8	2.7	1.7	10
HA-B2-M-15 (BK35)	5.9	2.8	2.1	15
HA-B2-M-15 (BK35)	5.3	2.9	2.1	13
HA-B2-M-15 (BK35)	4.2	2.1	1.5	5
HA-B2-M-15 (BK35)	5	2.9	1.7	11
HA-B2-M-15 (BK35)	5.4	2.8	1.9	11
HA-B2-M-15 (BK35)	4.6	3.1	2	12
HA-B2-M-15 (BK35)	3.9	2.3	1.3	7
HA-B2-M-15 (BK35)	3.8	2	1.3	6
HA-B2-M-15 (BK35)	4.9	2.5	1.7	10
HA-B2-M-15 (BK35)	1.9	1.2	0.7	0.1
HA-B2-M-15 (BK35)	1.6	0.9	0.7	0.1

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-15 (BK35)	1.9	1	0.6	0.1
HA-B2-M-15 (BK35)	1.2	0.7	0.5	0.1
HA-B2-M-15 (BK36)	7.9	7.3	7.3	434
HA-B2-M-15 (BK36)	18.1	7.6	5.8	259
HA-B2-M-15 (BK36)	18.1	7	6	270
HA-B2-M-15 (BK36)	13	5.7	4.2	140
HA-B2-M-15 (BK36)	13.3	6.7	4.5	140
HA-B2-M-15 (BK36)	14.1	6.3	4.3	149
HA-B2-M-15 (BK36)	13.6	6.1	4.6	144
HA-B2-M-15 (BK36)	11.8	5.7	4.1	92
HA-B2-M-15 (BK36)	9.9	4.3	3.8	73
HA-B2-M-15 (BK36)	9.4	4.7	3.8	61
HA-B2-M-15 (BK36)	10.1	4.9	3.9	61
HA-B2-M-15 (BK36)	7.9	4	2.6	33
HA-B2-M-15 (BK36)	8.2	4.2	3.5	46
HA-B2-M-15 (BK36)	7.6	4.1	2.7	32
HA-B2-M-15 (BK36)	6.5	2.7	2.5	25
HA-B2-M-15 (BK36)	5.3	3	2	12
HA-B2-M-15 (BK36)	5.2	2.9	2	13
HA-B2-M-15 (BK36)	5.3	2.9	1.7	13
HA-B2-M-15 (BK36)	4.9	2.6	2	11
HA-B2-M-15 (BK36)	4.9	2.6	1.7	9
HA-B2-M-15 (BK36)	5.2	2.7	1.7	8
HA-B2-M-15 (BK36)	4.4	2.2	1.4	7
HA-B2-M-15 (BK36)	3.9	1.9	1.3	5
HA-B2-M-15 (BK36)	3.9	2.3	1.4	6
HA-B2-M-15 (BK36)	3	1.5	1	2
HA-B2-M-15 (BK36)	3.7	1.9	1.2	4
HA-B2-M-15 (BK36)	4.1	2.1	1.4	5
HA-B2-M-15 (BK36)	3.3	1.8	1.1	2
HA-B2-M-15 (BK36)	2.4	1.4	1.8	1
HA-B2-M-15 (BK36)	2.6	1.4	0.9	2
HA-B2-M-15 (BK36)	2	1	0.7	1
HA-B2-M-15 (BK36)	1.7	1	0.5	0.1
HA-B2-M-15 (BK36)	18.4	7.2	6	466
HA-B2-M-17 (BK16)	18.2	7.2	6.2	403
HA-B2-M-17 (BK16)	23.2	8.3	7.9	599
HA-B2-M-17 (BK16)	17.6	7.5	6.7	324
HA-B2-M-17 (BK16)	17.9	6.7	6.7	298
HA-B2-M-17 (BK16)	17.5	6.6	6.4	315
HA-B2-M-17 (BK16)	14.9	6.6	5.2	173
HA-B2-M-17 (BK16)	13.4	6.3	4.7	173
HA-B2-M-17 (BK16)	11.4	5.6	4	98
HA-B2-M-17 (BK16)	11.4	5.7	4.6	105
HA-B2-M-17 (BK16)	10.9	5.2	4.2	110
HA-B2-M-17 (BK16)	12.7	6	4.5	121
HA-B2-M-17 (BK16)	9.8	4.8	3.3	53

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-17 (BK16)	8.9	4.7	3.2	50
HA-B2-M-17 (BK16)	8.9	4.8	3.2	51
HA-B2-M-17 (BK16)	9.6	5	3.2	59
HA-B2-M-17 (BK16)	8.3	4.3	2.9	42
HA-B2-M-17 (BK16)	8.6	4.5	3.1	47
HA-B2-M-17 (BK16)	8.4	4.1	2.6	36
HA-B2-M-17 (BK16)	6.9	3.6	2.7	30
HA-B2-M-17 (BK16)	6.6	3.3	2.5	24
HA-B2-M-17 (BK16)	6.9	3.3	2.3	22
HA-B2-M-17 (BK16)	6.5	3.1	2.4	18
HA-B2-M-17 (BK16)	5.9	3.3	2.2	17
HA-B2-M-17 (BK16)	5.8	3	2	16
HA-B2-M-17 (BK16)	5.5	3.4	2.1	17
HA-B2-M-17 (BK16)	5.1	2.8	1.8	14
HA-B2-M-17 (BK16)	5	2.8	1.5	11
HA-B2-M-17 (BK16)	4.7	2.5	1.7	9
HA-B2-M-17 (BK16)	4.5	2.4	4.5	7
HA-B2-M-17 (BK16)	4.5	2.4	1.8	10
HA-B2-M-17 (BK16)	3	2.1	1.2	4
HA-B2-M-17 (BK16)	3.3	1.9	1.1	4
HA-B2-M-17 (BK16)	1.9	1.2	0.7	1
HA-B2-M-17 (BK16)	2.7	1.8	0.9	2
HA-B2-M-17 (BK16)	11.4	4.8	3.9	79
HA-B2-M-17 (BK16)	10.4	5.1	3.7	69
HA-B2-M-17 (BK16)	9.4	4.6	3.7	59
HA-B2-M-17 (BK16)	8.6	4.2	3	40
HA-B2-M-17 (BK16)	9.6	5.1	3.3	58
HA-B2-M-17 (BK16)	8.8	4.6	3.3	52
HA-B2-M-17 (BK16)	8.9	4.3	3.6	68
HA-B2-M-17 (BK16)	8.6	4.7	3.1	55
HA-B2-M-17 (BK16)	8.7	4.5	3.2	50
HA-B2-M-17 (BK16)	11	4.9	3.5	85
HA-B2-M-17 (BK16)	9.4	4.7	3.5	54
HA-B2-M-17 (BK16)	9.3	4.3	3.5	56
HA-B2-M-17 (BK16)	7.9	3.9	2.9	35
HA-B2-M-17 (BK16)	7.3	3.4	2.7	25
HA-B2-M-17 (BK16)	6.9	4.3	2.9	31
HA-B2-M-17 (BK16)	7.4	3.9	2.3	26
HA-B2-M-17 (BK16)	6.9	3.6	2.1	23
HA-B2-M-17 (BK16)	7.6	3.6	2.6	29
HA-B2-M-17 (BK16)	6.4	3.4	2.3	21
HA-B2-M-17 (BK16)	6.3	3.4	2.4	18
HA-B2-M-17 (BK16)	6.1	3	2.2	17
HA-B2-M-17 (BK16)	5.4	2.7	1.7	11
HA-B2-M-17 (BK16)	5.7	3.1	1.8	13
HA-B2-M-17 (BK16)	5.8	3	2	19
HA-B2-M-17 (BK16)	5.4	3	2	16
HA-B2-M-17 (BK16)	5.7	3.2	1.8	15

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-17 (BK16)	5.3	2.9	1.7	13
HA-B2-M-17 (BK16)	5.3	3.3	1.7	16
HA-B2-M-17 (BK16)	4.8	2.8	1.9	9
HA-B2-M-17 (BK16)	3.8	2.2	1.3	6
HA-B2-M-17 (BK16)	4.8	2.7	1.5	13
HA-B2-M-17 (BK16)	3.1	1.8	1.2	5
HA-B2-M-17 (BK16)	3.4	2.9	1.1	4
HA-B2-M-17 (BK16)	3.4	2.1	1.3	5
HA-B2-M-17 (BK16)	3.5	2.1	1.3	5
HA-B2-M-17 (BK16)	3.1	1.8	1.1	3
HA-B2-M-17 (BK16)	3.3	1.8	1.1	3
HA-B2-M-17 (BK16)	2.7	1.6	1	2
HA-B2-M-17 (BK16)	2.6	1.6	1	3
HA-B2-M-17 (BK16)	2.4	1.5	1	2
HA-B2-M-17 (BK16)	2.4	1.4	0.9	2
HA-B2-M-17 (BK16)	2.6	1.6	0.9	2
HA-B2-M-17 (BK16)	2.5	1.5	0.9	2
HA-B2-M-17 (BK16)	3.3	1.4	0.9	2
HA-B2-M-17 (BK16)	1.7	0.9	0.7	1
HA-B2-M-17 (BK16)	2.1	1.5	0.7	1
HA-B2-M-17 (BK16)	1.6	1.1	0.6	0.1
HA-B2-M-17 (BK16)	1.5	0.9	0.6	1
HA-B2-M-17 (BK16)	1.5	1	0.6	1
HA-B2-M-17 (BK16)	1.5	1	0.5	0.1
HA-B2-M-17 (BK16)	1.4	0.8	0.5	0.1
HA-B2-M-17 (BK16)	1.4	0.8	0.5	0.1
HA-B2-M-17 (BK16)	1.2	0.7	0.4	0.1
HA-B2-M-19 (BK14)	18.4	7.9	7.5	642
HA-B2-M-19 (BK14)	16.6	7.2	6.1	295
HA-B2-M-19 (BK14)	18.4	8	6.7	523
HA-B2-M-19 (BK14)	13.4	6.1	4.6	150
HA-B2-M-19 (BK14)	14.2	6.5	5	211
HA-B2-M-19 (BK14)	11.8	5.6	3.9	100
HA-B2-M-19 (BK14)	13.6	6.1	4.6	151
HA-B2-M-19 (BK14)	11.5	5.8	3.2	43
HA-B2-M-19 (BK14)	9.9	4.5	3	59
HA-B2-M-19 (BK14)	10.1	5.4	3.5	89
HA-B2-M-19 (BK14)	8	4.1	2.9	38
HA-B2-M-19 (BK14)	10.7	5	4.5	64
HA-B2-M-19 (BK14)	9.5	5	3.6	51
HA-B2-M-19 (BK14)	8.4	4.3	3.8	38
HA-B2-M-19 (BK14)	8.5	4.6	2.6	44
HA-B2-M-19 (BK14)	7	3.5	2.6	30
HA-B2-M-19 (BK14)	8.7	4.2	2.8	31
HA-B2-M-19 (BK14)	8.8	4.7	3.6	51
HA-B2-M-19 (BK14)	7.4	3.4	2.4	28
HA-B2-M-19 (BK14)	7.4	4	2.4	31

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-19 (BK14)	7.1	3.4	2.5	21
HA-B2-M-19 (BK14)	6.1	3.5	2.8	27
HA-B2-M-19 (BK14)	6.2	3.6	2.1	14
HA-B2-M-19 (BK14)	6.7	3.3	2.1	23
HA-B2-M-19 (BK14)	6.5	3.7	2.6	25
HA-B2-M-19 (BK14)	6.1	3.1	2	16
HA-B2-M-19 (BK14)	6.4	3.8	2.7	28
HA-B2-M-19 (BK14)	6.9	3.6	2.3	24
HA-B2-M-19 (BK14)	7	3.3	2.3	23
HA-B2-M-19 (BK14)	6.3	3	2.2	16
HA-B2-M-19 (BK14)	5.4	3	1.8	13
HA-B2-M-19 (BK14)	4.9	2.9	1.6	13
HA-B2-M-19 (BK14)	5.4	2.9	1.9	13
HA-B2-M-19 (BK14)	5.4	2.6	1.8	11
HA-B2-M-19 (BK14)	5.3	2.5	1.7	10
HA-B2-M-19 (BK14)	4.8	2.8	1.8	9
HA-B2-M-19 (BK14)	4.2	2.6	1.8	7
HA-B2-M-19 (BK14)	4.6	2.4	1.3	7
HA-B2-M-19 (BK14)	6	2.2	1.8	9
HA-B2-M-19 (BK14)	4.9	2.3	1.8	10
HA-B2-M-19 (BK14)	4.5	2.3	1.5	8
HA-B2-M-19 (BK14)	4.5	2.1	1.5	7
HA-B2-M-19 (BK14)	3.8	2.1	1.3	5
HA-B2-M-19 (BK14)	4.1	2	1.3	5
HA-B2-M-19 (BK14)	3.9	2.7	1.5	6
HA-B2-M-19 (BK14)	3.9	2.2	1.4	5
HA-B2-M-19 (BK14)	3.8	2	1.2	5
HA-B2-M-19 (BK14)	4.5	2.3	1.5	6
HA-B2-M-19 (BK14)	3.4	1.9	0.9	3
HA-B2-M-19 (BK14)	3.5	1.9	1.2	3
HA-B2-M-19 (BK14)	3.2	1.8	1	2
HA-B2-M-19 (BK14)	3.4	1.7	1.2	4
HA-B2-M-19 (BK14)	3.5	2	1.2	4
HA-B2-M-19 (BK14)	2.7	1.7	1	2
HA-B2-M-19 (BK14)	2.8	1.8	1	2
HA-B2-M-19 (BK14)	2.8	1.6	1	1
HA-B2-M-19 (BK14)	2.6	1.6	0.8	2
HA-B2-M-19 (BK14)	2.4	1.4	0.9	2
HA-B2-M-19 (BK14)	2.4	1.5	0.9	2
HA-B2-M-19 (BK14)	1.9	1.2	0.7	1
HA-B2-M-19 (BK14)	2.2	1.4	0.8	1
HA-B2-M-19 (BK14)	1.5	1	0.6	0.1
HA-B2-M-19 (BK14)	1.8	1	0.7	0.1
HA-B2-M-19 (BK14)	1.7	1	0.7	1
HA-B2-M-19 (BK14)	1.2	0.9	0.5	0.1
HA-B2-M-19 (BK14)	1.2	0.7	0.4	0.1
HA-B2-M-19 (BK14)	1.8	1.2	0.6	1
HA-B2-M-19 (BK15)	6.3	3	2.2	20

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-19 (BK15)	10.1	5.2	3.4	70
HA-B2-M-19 (BK15)	8.1	4.4	3.3	41
HA-B2-M-19 (BK15)	19.3	7.8	7.2	532
HA-B2-M-19 (BK15)	18.8	7.5	6.7	450
HA-B2-M-19 (BK15)	18.6	6.9	6.7	366
HA-B2-M-19 (BK15)	17.4	7.2	7.2	397
HA-B2-M-19 (BK15)	17.1	7	5.5	382
HA-B2-M-19 (BK15)	16.6	7	5.5	284
HA-B2-M-19 (BK15)	17.8	7.4	6.3	366
HA-B2-M-19 (BK15)	14.6	6.7	4.4	169
HA-B2-M-19 (BK15)	11.7	5.7	4.2	110
HA-B2-M-19 (BK15)	13.2	6.3	4.5	131
HA-B2-M-19 (BK15)	12.2	6.8	4.3	104
HA-B2-M-19 (BK15)	10.8	3.3	3.8	68
HA-B2-M-19 (BK15)	11.2	5.4	3.8	82
HA-B2-M-19 (BK15)	9.7	4.4	3.5	64
HA-B2-M-19 (BK15)	9.9	4.4	3.2	68
HA-B2-M-19 (BK15)	10.1	5.2	3.4	78
HA-B2-M-19 (BK15)	8.1	4.5	3.3	47
HA-B2-M-19 (BK15)	8.6	4.3	3.1	45
HA-B2-M-19 (BK15)	8.9	4.8	3.4	59
HA-B2-M-19 (BK15)	8.2	4.2	3.8	46
HA-B2-M-19 (BK15)	8.2	3.3	3.1	67
HA-B2-M-19 (BK15)	9.1	4.5	3.1	52
HA-B2-M-19 (BK15)	8.1	3.6	2.6	35
HA-B2-M-19 (BK15)	6.7	3.8	2.4	22
HA-B2-M-19 (BK15)	7.6	3.8	2.6	29
HA-B2-M-19 (BK15)	7.6	3.9	2.9	36
HA-B2-M-19 (BK15)	7.6	3.6	2.8	33
HA-B2-M-19 (BK15)	6.9	3.9	2.9	28
HA-B2-M-19 (BK15)	5.6	3	2.4	23
HA-B2-M-19 (BK15)	5.4	3.1	2.2	20
HA-B2-M-19 (BK15)	6.4	3.2	2.1	21
HA-B2-M-19 (BK15)	8	3.7	2.3	33
HA-B2-M-19 (BK15)	6.4	3.2	2.1	22
HA-B2-M-19 (BK15)	5.8	3.1	2.2	18
HA-B2-M-19 (BK15)	5.7	3.2	2.1	18
HA-B2-M-19 (BK15)	6.3	3.2	2.2	20
HA-B2-M-19 (BK15)	6.2	2.8	2.2	15
HA-B2-M-19 (BK15)	7.7	4.2	3	39
HA-B2-M-19 (BK15)	5.5	3	1.9	13
HA-B2-M-19 (BK15)	5.9	3	2.1	14
HA-B2-M-19 (BK15)	6.3	3.5	2.5	22
HA-B2-M-19 (BK15)	5.6	3	2	15
HA-B2-M-19 (BK15)	5.6	2.8	1.7	12
HA-B2-M-19 (BK15)	5.7	3.2	2.2	17
HA-B2-M-19 (BK15)	4.4	1.9	1.2	12
HA-B2-M-19 (BK15)	3.7	2.6	1.6	5

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-19 (BK15)	5.2	3	1.8	13
HA-B2-M-19 (BK15)	4.3	2.2	1.4	7
HA-B2-M-19 (BK15)	4.6	2.2	1.6	8
HA-B2-M-19 (BK15)	3.6	2	1.2	5
HA-B2-M-19 (BK15)	3.5	1.4	1.3	3
HA-B2-M-19 (BK15)	3.1	1.8	1.1	4
HA-B2-M-19 (BK15)	2.7	1.4	1	2
HA-B2-M-19 (BK15)	3.4	1.7	1.2	4
HA-B2-M-19 (BK15)	3.5	1.9	1.2	3
HA-B2-M-19 (BK15)	2.3	1.4	0.9	2
HA-B2-M-19 (BK15)	2.3	1.3	0.9	1
HA-B2-M-19 (BK15)	2.2	1.2	0.8	0.1
HA-B2-M-19 (BK15)	1.7	1	0.6	1
HA-B2-M-19 (BK15)	1.7	1	0.5	0.1
HA-B2-M-21 (BK12)	19.4	7.3	6.4	328
HA-B2-M-21 (BK12)	18.7	7.8	6.6	321
HA-B2-M-21 (BK12)	20.4	7.7	7.2	457
HA-B2-M-21 (BK12)	18.9	6.7	7.1	270
HA-B2-M-21 (BK12)	21.1	8.1	8	431
HA-B2-M-21 (BK12)	18	6.1	6.8	289
HA-B2-M-21 (BK12)	15.4	6.7	4.9	158
HA-B2-M-21 (BK12)	18	7.3	6.2	286
HA-B2-M-21 (BK12)	14.6	6.4	4.7	129
HA-B2-M-21 (BK12)	15.6	6.2	4.7	185
HA-B2-M-21 (BK12)	11	5.5	4.5	90
HA-B2-M-21 (BK12)	12.6	5	4.3	120
HA-B2-M-21 (BK12)	11.1	5.2	3.7	69
HA-B2-M-21 (BK12)	9.9	4.8	3.2	49
HA-B2-M-21 (BK12)	9.9	4.9	3.4	60
HA-B2-M-21 (BK12)	9.9	5	3.1	47
HA-B2-M-21 (BK12)	10.4	4.7	3.6	67
HA-B2-M-21 (BK12)	9.9	4.7	3.4	54
HA-B2-M-21 (BK12)	9.3	4.5	3	43
HA-B2-M-21 (BK12)	8.8	4.5	3	38
HA-B2-M-21 (BK12)	8.9	4.3	3.1	41
HA-B2-M-21 (BK12)	10.9	5.4	3.8	73
HA-B2-M-21 (BK12)	11.9	5.5	3.9	87
HA-B2-M-21 (BK12)	6.9	3.6	2.6	22
HA-B2-M-21 (BK12)	6.4	3.5	2.7	24
HA-B2-M-21 (BK12)	5.4	2.7	1.7	10
HA-B2-M-21 (BK12)	9.4	4.3	3.3	46
HA-B2-M-21 (BK12)	8.5	4.2	2.8	36
HA-B2-M-21 (BK12)	8.3	4.3	2.6	29
HA-B2-M-21 (BK12)	6.4	3.8	2.8	24
HA-B2-M-21 (BK12)	6.9	3.4	2.3	22
HA-B2-M-21 (BK12)	7.4	4.2	3.7	32
HA-B2-M-21 (BK12)	7.1	3.9	2.7	30

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-21 (BK12)	7.5	3.6	2.5	25
HA-B2-M-21 (BK12)	6.8	3.5	2.3	20
HA-B2-M-21 (BK12)	6.9	3.1	2.2	19
HA-B2-M-21 (BK12)	7.5	3.8	2.3	24
HA-B2-M-21 (BK12)	6.5	4.1	2.2	20
HA-B2-M-21 (BK12)	6.6	3.2	1.8	16
HA-B2-M-21 (BK12)	5.7	4.4	2.1	16
HA-B2-M-21 (BK12)	6.6	3	2.3	21
HA-B2-M-21 (BK12)	6.8	3.2	2.2	20
HA-B2-M-21 (BK12)	5.9	3.2	2.3	18
HA-B2-M-21 (BK12)	6	3.2	2	14
HA-B2-M-21 (BK12)	4.9	2.7	1.7	6
HA-B2-M-21 (BK12)	5.3	3.1	2.5	15
HA-B2-M-21 (BK12)	6	3.3	2.2	16
HA-B2-M-21 (BK12)	5.4	3.4	1.9	20
HA-B2-M-21 (BK12)	4.5	2.6	1.6	9
HA-B2-M-21 (BK12)	4.6	2.4	1.5	8
HA-B2-M-21 (BK12)	4.4	2.4	1.4	8
HA-B2-M-21 (BK12)	4.4	2.2	1.5	7
HA-B2-M-21 (BK12)	4.4	2.1	1.4	6
HA-B2-M-21 (BK12)	4	2	1.4	5
HA-B2-M-21 (BK12)	3.6	2.2	1.6	7
HA-B2-M-21 (BK12)	4	2	1.3	6
HA-B2-M-21 (BK12)	3.1	1.7	1	3
HA-B2-M-21 (BK12)	3.1	1.7	1.1	4
HA-B2-M-21 (BK12)	2.4	1.4	0.9	2
HA-B2-M-21 (BK12)	2.1	1.3	0.7	2
HA-B2-M-21 (BK12)	2.1	1.4	0.8	0.1
HA-B2-M-21 (BK12)	1.7	1.1	0.7	0.1
HA-B2-M-21 (BK12)	1.6	1	0.6	0.1
HA-B2-M-22 (BK10)	19.8	8	7.9	466
HA-B2-M-22 (BK10)	20.7	8.8	7.6	563
HA-B2-M-22 (BK10)	17.4	7	7.2	276
HA-B2-M-22 (BK10)	19.5	7.6	7.8	377
HA-B2-M-22 (BK10)	14.4	7.5	6.2	172
HA-B2-M-22 (BK10)	12.7	7	5.6	126
HA-B2-M-22 (BK10)	12.8	5.8	5.1	107
HA-B2-M-22 (BK10)	12.2	5.7	3.6	86
HA-B2-M-22 (BK10)	12.8	5.6	4.9	106
HA-B2-M-22 (BK10)	11.9	5.8	4.6	105
HA-B2-M-22 (BK10)	12.3	5.5	4.1	89
HA-B2-M-22 (BK10)	11.3	5.4	3.7	85
HA-B2-M-22 (BK10)	12.2	5.4	4.4	98
HA-B2-M-22 (BK10)	11	5.3	3.7	69
HA-B2-M-22 (BK10)	10.9	5.1	3.7	81
HA-B2-M-22 (BK10)	10.4	5.1	3.7	70
HA-B2-M-22 (BK10)	10.1	5.1	3.7	83

PLATFORM HARVEST - Mussel Measurements				
Station/Quadrat	Length (cm)	Width (cm)	Height (cm)	Weight (gms)
HA-B2-M-22 (BK10)	8.9	4.4	3.2	45
HA-B2-M-22 (BK10)	8.5	4.3	2.7	34
HA-B2-M-22 (BK10)	9.3	4.7	3.2	47
HA-B2-M-22 (BK10)	7.8	3.7	2.8	28
HA-B2-M-22 (BK10)	7.5	4.1	2.8	38
HA-B2-M-22 (BK10)	8.9	4.3	3	53
HA-B2-M-22 (BK10)	7.5	3.8	2.7	29
HA-B2-M-22 (BK10)	8.4	4	2.6	34
HA-B2-M-22 (BK10)	7.6	3.7	2.3	30
HA-B2-M-22 (BK10)	7.9	3.8	2.8	32
HA-B2-M-22 (BK10)	6.9	3.6	2.3	20
HA-B2-M-22 (BK10)	7.2	3.7	2.3	25
HA-B2-M-22 (BK10)	6.8	3.7	2.2	22
HA-B2-M-22 (BK10)	5.9	3.4	2.2	13
HA-B2-M-22 (BK10)	5.9	3.2	2	18
HA-B2-M-22 (BK10)	5.9	3	1.9	15
HA-B2-M-22 (BK10)	5.9	3	2.1	16
HA-B2-M-22 (BK10)	5.4	2.6	1.7	10
HA-B2-M-22 (BK10)	5.4	2.8	1.7	14
HA-B2-M-22 (BK10)	4.7	2.4	1.4	9
HA-B2-M-22 (BK10)	4.6	2.5	1.4	8
HA-B2-M-22 (BK10)	4.3	2.2	1.6	7
HA-B2-M-22 (BK10)	3.8	2.3	1.3	4
HA-B2-M-22 (BK10)	4.4	2.3	1.5	8
HA-B2-M-22 (BK10)	4.3	2.3	1.4	6
HA-B2-M-22 (BK10)	3.7	1.2	1.3	5
HA-B2-M-22 (BK10)	3.9	2.1	1.3	5
HA-B2-M-22 (BK10)	3.3	1.8	1.1	3
HA-B2-M-22 (BK10)	2.3	1.3	0.3	1
HA-B2-M-22 (BK10)	2.3	1.5	0.8	1
HA-B2-M-22 (BK10)	2.2	1.2	0.8	1
HA-B2-M-22 (BK10)	1.8	0.1	0.7	1

MUSSEL MEASUREMENTS - STATISTICS				
<i>Quadrat/Parameter</i>	<i>Length (cm)</i>	<i>Width (cm)</i>	<i>Height (cm)</i>	<i>Weight (gms)</i>
HA-B1-M-18:				
Mean	7.23	3.68	2.69	55.51
Standard Error	0.55	0.22	0.21	11.80
Median	7.2	4	2.6	28
Mode	8.3	4.2	3.7	1
Standard Deviation	4.40	1.78	1.69	93.65
Sample Variance	19.34	3.18	2.84	8770.86
Kurtosis	0.149706745	-0.749250115	1.028096656	10.30707924
Skewness	0.708772082	0.154299079	0.93116508	3.147967186
Range	17.5	6.9	7.2	465.9
Minimum	1.4	1	0.5	0.1
Maximum	18.9	7.9	7.7	466
Sum	455.8	232.1	169.6	3497.4
Count	63	63	63	63
Confidence Level(95.0%)	1.11	0.45	0.42	23.59
HA-B1-M-20:				
Mean	4.13	2.25	1.58	10.78
Standard Error	1.37	0.68	0.48	6.41
Median	4.1	2.35	1.7	7
Mode	#N/A	#N/A	1.7	#N/A
Standard Deviation	2.73	1.36	0.95	12.81
Sample Variance	7.47	1.84	0.90	164.20
Kurtosis	-0.113953843	1.366951267	1.834270762	2.005156132
Skewness	0.048608574	-0.431536903	-0.771249453	1.433864847
Range	6.5	3.3	2.3	28.9
Minimum	0.9	0.5	0.3	0.1
Maximum	7.4	3.8	2.6	29
Sum	16.5	9	6.3	43.1
Count	4	4	4	4
Confidence Level(95.0%)	4.35	2.16	1.51	20.39
HA-B1-M-24:				
Mean	3.81	2.25	1.67	19.17
Standard Error	0.61	0.30	0.23	6.77
Median	2.65	1.55	1.15	2.5
Mode	5.4	1.4	1.1	2
Standard Deviation	3.10	1.53	1.19	34.53
Sample Variance	9.61	2.35	1.42	1192.64
Kurtosis	0.187012975	0.273587781	0.860081563	4.302013949
Skewness	1.126419561	1.177719254	1.323222297	2.258829386
Range	10.3	5.1	4.1	125.9
Minimum	0.7	0.7	0.4	0.1
Maximum	11	5.8	4.5	126
Sum	99	58.4	43.3	498.4
Count	26	26	26	26
Confidence Level(95.0%)	1.25	0.62	0.48	13.95

MUSSEL MEASUREMENTS - STATISTICS				
<i>Quadrat/Parameter</i>	<i>Length (cm)</i>	<i>Width (cm)</i>	<i>Height (cm)</i>	<i>Weight (gms)</i>
HA-B1-M-25:				
Mean	4.92	2.67	1.80	21.78
Standard Error	0.71	0.33	0.26	8.55
Median	4.3	2.5	1.75	9.5
Mode	5.3	4.7	0.6	1
Standard Deviation	3.34	1.54	1.22	40.08
Sample Variance	11.16	2.36	1.49	1606.44
Kurtosis	2.347923874	0.342423955	2.62702799	14.47868564
Skewness	1.320932704	0.863525544	1.387838789	3.585475394
Range	13.5	5.7	5	185.9
Minimum	1.4	0.9	0.5	0.1
Maximum	14.9	6.6	5.5	186
Sum	108.3	58.8	39.6	479.2
Count	22	22	22	22
Confidence Level(95.0%)	1.48	0.68	0.54	17.77
HA-B1-M-32:				
Mean	5.42	2.94	1.96	25.36
Standard Error	0.71	0.36	0.25	9.74
Median	5.3	2.7	1.95	13.5
Mode	6.4	3.9	2.6	1
Standard Deviation	3.18	1.60	1.11	43.55
Sample Variance	10.14	2.57	1.23	1896.97
Kurtosis	3.120295248	0.533221648	2.59345907	15.18890291
Skewness	1.267176194	0.67994094	1.113368113	3.708845105
Range	13.4	6.1	4.7	199.9
Minimum	1.6	0.9	0.5	0.1
Maximum	15	7	5.2	200
Sum	108.4	58.7	39.1	507.2
Count	20	20	20	20
Confidence Level(95.0%)	1.49	0.75	0.52	20.38
HA-B2-M-11:				
Mean	8.67	4.02	2.93	78.94
Standard Error	0.43	0.16	0.15	9.24
Median	7.8	4	2.7	31
Mode	8.9	4.4	2.8	2
Standard Deviation	5.24	1.98	1.78	112.80
Sample Variance	27.46	3.93	3.16	12723.13
Kurtosis	-0.397724006	-1.042871215	-0.362198636	5.880506061
Skewness	0.643020016	0.191055845	0.663083304	2.278660866
Range	21.1	7.4	7.1	633.9
Minimum	1.3	0.8	0.4	0.1
Maximum	22.4	8.2	7.5	634
Sum	1291.9	599.2	437.3	11762.2
Count	149	149	149	149
Confidence Level(95.0%)	0.85	0.32	0.29	18.26

MUSSEL MEASUREMENTS - STATISTICS				
<i>Quadrat/Parameter</i>	<i>Length (cm)</i>	<i>Width (cm)</i>	<i>Height (cm)</i>	<i>Weight (gms)</i>
HA-B2-M-13:				
Mean	9.90	4.48	3.42	111.42
Standard Error	0.54	0.19	0.19	16.36
Median	8.9	4.4	3.05	45
Mode	1.9	3.6	3	2
Standard Deviation	5.44	1.96	1.89	165.26
Sample Variance	29.65	3.82	3.57	27310.61
Kurtosis	-0.435074615	-0.663078831	-0.069904367	8.281295882
Skewness	0.557638611	-0.039343764	0.638138054	2.675405903
Range	20.8	8.3	8.3	927.9
Minimum	1.6	0.8	0.5	0.1
Maximum	22.4	9.1	8.8	928
Sum	1010.1	457.4	348.8	11364.4
Count	102	102	102	102
Confidence Level(95.0%)	1.07	0.38	0.37	32.46
HA-B2-M-14:				
Mean	8.55	4.12	2.99	108.12
Standard Error	0.84	0.34	0.31	24.79
Median	6.9	3.55	2.4	25.5
Mode	10.4	2.9	1.7	1
Standard Deviation	5.95	2.38	2.17	175.30
Sample Variance	35.39	5.65	4.69	30729.25
Kurtosis	-0.232103023	-0.705126191	-0.01431437	2.690628472
Skewness	0.933315772	0.562832362	0.954046708	1.912224491
Range	20.5	8.6	8.3	715
Minimum	1.2	0.6	0.3	1
Maximum	21.7	9.2	8.6	716
Sum	427.6	205.8	149.5	5406
Count	50	50	50	50
Confidence Level(95.0%)	1.69	0.68	0.62	49.82
HA-B2-M-15:				
Mean	7.53	3.69	2.67	61.40
Standard Error	0.33	0.13	0.12	8.97
Median	6.4	3.3	2.3	20
Mode	4.9	3	2	11
Standard Deviation	4.27	1.71	1.54	115.97
Sample Variance	18.26	2.91	2.36	13449.34
Kurtosis	0.394239661	-0.500005078	1.682091388	22.84287362
Skewness	1.012640442	0.560494941	1.26489547	4.214344122
Range	18.7	7.2	8.3	897.9
Minimum	1.2	0.7	0.5	0.1
Maximum	19.9	7.9	8.8	898
Sum	1257.8	615.6	445.4	10254.4
Count	167	167	167	167
Confidence Level(95.0%)	0.65	0.26	0.23	17.72

MUSSEL MEASUREMENTS - STATISTICS				
<i>Quadrat/Parameter</i>	<i>Length (cm)</i>	<i>Width (cm)</i>	<i>Height (cm)</i>	<i>Weight (gms)</i>
HA-B2-M-17:				
Mean	6.80	3.40	2.46	50.44
Standard Error	0.47	0.18	0.17	10.17
Median	5.9	3.3	2.2	17
Mode	6.9	4.3	0.9	2
Standard Deviation	4.39	1.72	1.59	94.86
Sample Variance	19.26	2.97	2.53	8999.01
Kurtosis	2.019493814	-0.116844004	1.42490753	15.51374235
Skewness	1.263042824	0.539420941	1.158642617	3.673085426
Range	22	7.6	7.5	598.9
Minimum	1.2	0.7	0.4	0.1
Maximum	23.2	8.3	7.9	599
Sum	591.5	295.8	213.9	4388.5
Count	87	87	87	87
Confidence Level(95.0%)	0.94	0.37	0.34	20.22
HA-B2-M-19:				
Mean	7.05	3.93	2.51	59.54
Standard Error	0.38	0.51	0.14	10.12
Median	6.2	3.2	2.2	20
Mode	6.3	3	1.2	2
Standard Deviation	4.34	5.85	1.58	115.44
Sample Variance	18.88	34.20	2.51	13325.82
Kurtosis	0.891526258	106.849472	1.395254956	9.860544779
Skewness	1.149494357	9.87609095	1.256025045	3.133181947
Range	18.1	66.3	7.1	641.9
Minimum	1.2	0.7	0.4	0.1
Maximum	19.3	67	7.5	642
Sum	916.9	510.7	326.1	7739.6
Count	130	130	130	130
Confidence Level(95.0%)	0.75	1.01	0.28	20.03
HA-B2-M-21:				
Mean	8.44	3.98	2.95	68.32
Standard Error	0.63	0.22	0.22	13.39
Median	6.9	3.8	2.5	24
Mode	9.9	3.2	2.3	20
Standard Deviation	4.97	1.77	1.76	106.25
Sample Variance	24.72	3.13	3.08	11289.30
Kurtosis	0.369299546	-0.294812527	0.899981009	4.612027153
Skewness	1.033804999	0.488831859	1.167515881	2.295114932
Range	19.5	7.1	7.4	456.9
Minimum	1.6	1	0.6	0.1
Maximum	21.1	8.1	8	457
Sum	531.7	250.5	185.8	4304.3
Count	63	63	63	63
Confidence Level(95.0%)	1.25	0.45	0.44	26.76

MUSSEL MEASUREMENTS - STATISTICS				
<i>Quadrat/Parameter</i>	<i>Length (cm)</i>	<i>Width (cm)</i>	<i>Height (cm)</i>	<i>Weight (gms)</i>
HA-B2-M-22:				
Mean	8.48	4.06	3.04	72.27
Standard Error	0.67	0.28	0.27	16.60
Median	7.6	3.8	2.7	30
Mode	5.9	3.7	3.7	1
Standard Deviation	4.66	1.95	1.91	116.23
Sample Variance	21.67	3.81	3.66	13509.70
Kurtosis	0.484709989	-0.224871212	0.709903003	8.815968167
Skewness	0.881437802	0.38698279	1.097189705	2.920676156
Range	18.9	8.7	7.6	562
Minimum	1.8	0.1	0.3	1
Maximum	20.7	8.8	7.9	563
Sum	415.6	198.7	148.9	3541
Count	49	49	49	49
Confidence Level(95.0%)	1.34	0.56	0.55	33.39
Mussels Measured by Quadrat				
Station	Count			
HA-B1-M-18	63			
HA-B1-M-20	4			
HA-B1-M-24	26			
HA-B1-M-25	22			
HA-B1-M-32	20			
HA-B2-M-11	149			
HA-B2-M-13	102			
HA-B2-M-14	50			
HA-B2-M-15	167			
HA-B2-M-17	87			
HA-B2-M-19	130			
HA-B2-M-21	63			
HA-B2-M-22	49			
Total	932			

PLATFORM GAIL - Taxa vs. All Stations/Quadrats																			Occurrence	Mean														
Species or Taxon	GA-A1-B/S-49	GA-A1-B/S-56	GA-A1-B/S-63	GA-A1-B/S-68	GA-A1-B/S-75	GA-A1-B/S-78	GA-A1-1-1	GA-A1-1-2	GA-A1-1-3	GA-A1-1-4	GA-A1-1-5	GA-A1-M-10	GA-A1-M-19	GA-A1-M-22	GA-A1-M-34	GA-A1-M-35	GA-A1-M-37	GA-B1-B/S-5			GA-B1-B/S-6	GA-B1-1-1	GA-B1-1-2	GA-B1-1-3	GA-B1-M-9	GA-B1-M-12	GA-B1-M-18	GA-B1-M-24	GA-B1-M-25	GA-B1-M-29	GA-B1-M-30	GA-B1-M-33	GA-B1-M-34	
<i>Heterosiphonia japonica?</i>																																0	0.00	
<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1				1	1		1	1	1	1		1	1		1			1			1		1	1	1	1	1	1	1	1	1	19	1.00
<i>Anthopleura elegantissima</i>							1																										1	1.00
<i>Metridium senile</i>		1		1	2	1						1					1	1						1	1					1	1		13	1.08
<i>Spirobranchus spinosus</i>			1	1			1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1		21	1.10	
<i>Ophiothrix spiculata</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	2	1	2	30	1.10
<i>Elasmopus hologurus</i>	2	1	1	1	1	1	1	2	2	1	1	1	1	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	31	1.19
<i>Diadumene cincta</i>																	1	1													2	4	1.25	
<i>Balanus trigonus</i>	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	1	2	1	1	2	1	1	2	1	2	31	1.32
<i>Metridium exilis</i>	1				2		3	1	1	1	1	2	1	1	2		1	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	25	1.36
<i>Tetraclita rubescens</i>							1	2	2	2	2					2				1	1	1										9	1.56	
<i>Chama arcana</i>	3	1	2		3		1	2	1	2	2	1	1	1	1	1	1	1	1	1	1	2		3	1	2	1			3	24	1.58		
<i>Ophiactis simplex</i>	2	2				2	2	2		1			2	2	2	2	2	2	2	2	1	1	2	2	2	2	2	1	1	2	1	24	1.75	
<i>Haplosclerida nr. Haliclona</i> sp	1	1	1	2	1	2	2		3	1			2	2	2	2	2	2	2	2	3		3	2	2	2	2	2	2	1	1	1	23	1.78
<i>Phyllococe medipapillata</i>	1	1	2	2			2	2	1	2	2		2	2		2	2			2		2		2	2	2	2	2	2	2	2	20	1.85	
<i>Caprella equilibra</i>	1	2			2	1	3					3	2	1	2	2		2	2	2	2	2	2	2	1	1	2	2	2	1	3	22	1.86	
<i>Nereis mendocinana</i>	2	2			1	2	2		2				2		2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	16	1.94	
<i>Lithophaga plumula</i>	1						2				3	3	3	2	2	2	2	2	2					3	1	1	2		1	2	1	3	18	2.00
<i>Antithamnion hubbsii</i> Dawson	2				2	2	2	2		2	2		2		2	2	2	2			2											10	2.00	
<i>Pododesmus cepio</i>	3	1	1		3	1											2						3									7	2.00	
<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hollenb.					2	2		2						2	2											2						6	2.00	
<i>Crassadoma gigantea</i>														2																		1	2.00	
<i>Obelia</i> nr. <i>surcularis</i>								2																								1	2.00	
<i>Strongylocentrotus purpuratus</i>												2																				1	2.00	
<i>Hiatella arctica</i>	2					2	3	1		2	1	2	3	2	2	2	2	2	2				1	1	3	2		2	3	3	20	2.05		
<i>Mytilus</i> spp						3	3	3	1		3	3	3	3	3	3	3	3		1	1	1	2	1	2	1	2	1	3	3	1	22	2.14	
<i>Megabalanus californicus</i>	2	2	3	3	1	2	3	2	2	2	2	3	3	3	3		2			1	1	1	3	3	1	3					23	2.22		
<i>Jassa slatteryi</i>		3		3							2	3	2	2							1	2	2	1	2	3		2	3	3	15	2.27		
<i>Aplidium</i> sp	3					3						3						1	1						3		2	2	3	3	1	11	2.27	
<i>Gammaropsis thompsoni</i>	2	2	3	3	2	2				2	3	3	2	2		3	2							2	2		3	2	2		18	2.33		
<i>Erichthonius brasiliensis</i>				2	3	2									3		2															5	2.40	
<i>Leucothoe alata</i>	2	2		2	2	3					3	3		3		3	2	3	3	3				3	2		2	3	2	2	2	21	2.48	
<i>Kellia suborbicularis</i>	3										3	3				2		3						2	3	2		3	1	3	2	12	2.50	
<i>Balanus nubilus</i>	2	2		3	3		1					3		3		3		3							3							9	2.56	
<i>Monocorophium</i> sp	3	2	3	3				3				2	3		3	3									2	2	3	3	2	1	3	16	2.56	
<i>Halosydna brevisetosa</i>	2	3			3	2		2			3	3		2	2		3		2	3	2	3	3	3	3	3	2	2	3	3	3	22	2.59	
<i>Ostrea conchaphila</i>												3					2		3	2	3											5	2.60	
<i>Dulichieilla appendiculata</i>			2	3	3													3														4	2.75	
<i>Phascolosoma agassizi</i>							3			3	3		3		3		3	3					3	2	3		3	1	3	3	3	13	2.77	
<i>Pachygrapsus crassipes</i>								3		3		3				3	3			2	2	3		3	3						11	2.82		
<i>Parapleutes pugettensis</i>						2															3	3		3	3					3	6	2.83		
<i>Phyllochaetopterus prolifica</i>			3		2	3		3	3	3	3	3	3			3						3		3		3	3	3	3	3	15	2.93		
<i>Aplousobranchia</i> (<i>Diplosoma</i>)	3				3										3							3		3	3			3		3	8	3.00		
<i>Filicisia</i> sp	3				3	3			3											3				3	3	3					8	3.00		
<i>Syllis gracilis</i>					3											3								3	3	3		3			8	3.00		
<i>Ceramium camouii</i> Dawson						3										3									3	3	3				6	3.00		
<i>Paraxanthias taylori</i>															3				3						3	3	3				3	6	3.00	
<i>Acrosorium venulosum</i> (Zanardini) Kylin						3								3												3			3	3	5	3.00		
<i>Harmothoe ? hirsuta</i>																	3												3	3	3	5	3.00	
<i>Arabella iricolor</i>								3		3																3						4	3.00	
<i>Branchioglossum bipinnatifidum</i> (Mont.) Wynne					3									3							3						3				4	3.00		

PLATFORM GAIL - Taxa vs. All Stations/Quadrats																																					
Species or Taxon	Stations/Quadrats																											Mean									
	GA-A1-B/S-49	GA-A1-B/S-56	GA-A1-B/S-63	GA-A1-B/S-68	GA-A1-B/S-75	GA-A1-B/S-78	GA-A1-1-1	GA-A1-1-2	GA-A1-1-3	GA-A1-1-4	GA-A1-1-5	GA-A1-M-10	GA-A1-M-19	GA-A1-M-22	GA-A1-M-34	GA-A1-M-35	GA-A1-M-37	GA-B1-B/S-5	GA-B1-B/S-6	GA-B1-1-1	GA-B1-1-2	GA-B1-1-3	GA-B1-M-9	GA-B1-M-12	GA-B1-M-18	GA-B1-M-24	GA-B1-M-25		GA-B1-M-29	GA-B1-M-30	GA-B1-M-33	GA-B1-M-34	Occurrence				
<i>Crisia</i> sp	3																															4	3.00				
<i>Obelia dichotoma</i>	3			3																												4	3.00				
<i>Trypanosyllis</i> sp.										3										3	3											4	3.00				
<i>Callophyllis</i> sp.	3																								3								3	3.00			
<i>Modiolus capax</i>																																	3	3.00			
<i>Pilumnus spinohirsutus</i>	3																															3	3.00				
<i>Stenothoe estacola</i>																																	3	3.00			
<i>Aoroides</i> sp				3	3																												2	3.00			
<i>Gregariella coarctata</i>											3																						2	3.00			
<i>Janiropsis tridens</i>																																		2	3.00		
<i>Naineris dentritica</i>																																	3	3.00			
<i>Obelia geniculata</i>																																		2	3.00		
<i>Pachycheles pubescens</i>																																		2	3.00		
<i>Paleonotus bellis</i>																																		2	3.00		
Syllidae																																		2	3.00		
<i>Amphissa reticulata</i> (dead)																																		1	3.00		
<i>Campanularia</i> sp				3																														1	3.00		
cf. <i>Sinocorophium</i> sp																																		1	3.00		
<i>Corynactis californica</i>																																			1	3.00	
<i>Crassostrea gigas</i>																																			1	3.00	
<i>Dodecaceria concharum</i>																																			1	3.00	
Doridacea																																			1	3.00	
<i>Harmothoe</i> sp.																																			1	3.00	
<i>Holothuroidea</i> juv unid																																			1	3.00	
<i>Iselica</i> sp																																			3	1	3.00
<i>Lineus rubescens</i>																																			1	3.00	
<i>Lytechinus pictus</i>																																				1	3.00
<i>Musculus</i> sp damaged																																			1	3.00	
Mysidacea frag																																			1	3.00	
<i>Obelia plicata</i>																																				1	3.00
<i>Ophiopteris papillosa</i>																																				1	3.00
<i>Ophiozoidea</i> juv unid	3																																			1	3.00
<i>Phyllodoce</i> sp.																																				1	3.00
<i>Procerarea</i> sp.																																				1	3.00
<i>Pugettia</i> sp juv																																				1	3.00
<i>Pycnogonida</i> juv																																				1	3.00
<i>Quadrimaera reishi</i>																																				1	3.00
<i>Seila montereyensis</i>																																				1	3.00
<i>Tetrastemma signifer</i>																																				1	3.00
Count:	30	18	13	18	27	18	23	22	16	20	23	22	19	31	25	29	20	20	36	20	19	20	19	28	41	27	23	25	23	27	21						

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-A1-B/S-49	<i>Balanus trigonus</i>	1	Key:
	<i>Caprella equilibra</i>	1	1 = abundant
	<i>Haplosclerida nr. Haliclona</i> sp	1	2 = moderately abundant
	<i>Lithophaga plumula</i>	1	3 = limited, sparse
	<i>Metridium exilis</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Phyllodoce medipapillata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Balanus nubilus</i>	2	
	<i>Elasmopus hologurus</i>	2	
	<i>Gammaropsis thompsoni</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Hiatella arctica</i>	2	
	<i>Leucothoe alata</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Nereis mendocinana</i>	2	
	<i>Ophiactis simplex</i>	2	
	<i>Aplidium</i> sp	3	
	<i>Aplousobranchia (Diplosoma)</i>	3	
	<i>Callophyllis</i> sp.	3	
<i>Chama arcana</i>	3		
<i>Crisia</i> sp	3		
<i>Filicrisia</i> sp	3		
<i>Kellia suborbicularis</i>	3		
<i>Monocorophium</i> sp	3		
<i>Obelia dichotoma</i>	3		
Ophioroidea juv unid	3		
<i>Pilumnus spinohirsutus</i>	3		
<i>Pododesmus cepio</i>	3		
GA-A1-B/S-56	<i>Balanus trigonus</i>	1	
	<i>Chama arcana</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Haplosclerida nr. Haliclona</i> sp	1	
	<i>Metridium senile</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Phyllodoce medipapillata</i>	1	
	<i>Pododesmus cepio</i>	1	
	<i>Balanus nubilus</i>	2	
	<i>Caprella equilibra</i>	2	
	<i>Gammaropsis thompsoni</i>	2	
	<i>Leucothoe alata</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Monocorophium</i> sp	2	
	<i>Nereis mendocinana</i>	2	
	<i>Ophiactis simplex</i>	2	
	<i>Halosydna brevisetosa</i>	3	
<i>Jassa slatteryi</i>	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-A1-B/S-63	<i>Elasmopus hologurus</i>	1	
	<i>Haplosclerida nr. Haliclona</i> sp	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pododesmus cepio</i>	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Balanus trigonus</i>	2	
	<i>Chama arcana</i>	2	
	<i>Dulichella appendiculata</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Gammaropsis thompsoni</i>	3	
	<i>Megabalanus californicus</i>	3	
	<i>Monocorophium</i> sp	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	GA-A1-B/S-68	<i>Elasmopus hologurus</i>	1
<i>Metridium senile</i>		1	
<i>Ophiothrix spiculata</i>		1	
<i>Spirobranchus spinosus</i>		1	
<i>Balanus trigonus</i>		2	
<i>Erichthonius brasiliensis</i>		2	
<i>Haplosclerida nr. Haliclona</i> sp		2	
<i>Leucothoe alata</i>		2	
<i>Phyllodoce medipapillata</i>		2	
<i>Aoroides</i> sp		3	
<i>Balanus nubilus</i>		3	
<i>Campanularia</i> sp		3	
<i>Dulichella appendiculata</i>		3	
<i>Gammaropsis thompsoni</i>		3	
<i>Jassa slatteryi</i>		3	
<i>Megabalanus californicus</i>		3	
<i>Monocorophium</i> sp		3	
<i>Obelia dichotoma</i>	3		
GA-A1-B/S-75	<i>Balanus trigonus</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Haplosclerida nr. Haliclona</i> sp	1	
	<i>Megabalanus californicus</i>	1	
	<i>Nereis mendocinana</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Antithamnion hubbsii</i> Dawson	2	
	<i>Caprella equilibra</i>	2	
	<i>Gammaropsis thompsoni</i>	2	
	<i>Leucothoe alata</i>	2	
	<i>Metridium exilis</i>	2	
	<i>Metridium senile</i>	2	
	<i>Phyllochaetopterus prolifica</i>	2	
	<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hol	2	
	<i>Aoroides</i> sp	3	
<i>Aplousobranchia (Diplosoma)</i>	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-A1-B/S-75	<i>Balanus nubilus</i>	3	
(continued)	<i>Branchioglossum bipinnatifidum</i> (Mont.) Wynne	3	
	<i>Chama arcana</i>	3	
	<i>Dodecaceria concharum</i>	3	
	<i>Dulichella appendiculata</i>	3	
	<i>Erichthonius brasiliensis</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Halosydna brevisetosa</i>	3	
	<i>Pododesmus cepio</i>	3	
	<i>Syllis gracilis</i>	3	
GA-A1-B/S-78	<i>Balanus trigonus</i>	1	
	<i>Caprella equilibra</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Metridium senile</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pododesmus cepio</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Erichthonius brasiliensis</i>	2	
	<i>Gammaropsis thompsoni</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2	
	<i>Hiatella arctica</i>	2	
	<i>Leucothoe alata</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hol	2	
	<i>Acrosorium venulosum</i> (Zanardini) Kylin	3	
	<i>Lytechinus pictus</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
GA-A1-I-1	<i>Anthopleura elegantissima</i>	1	
	<i>Balanus nubilus</i>	1	
	<i>Balanus trigonus</i>	1	
	<i>Chama arcana</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Antithamnion hubbsii</i> Dawson	2	
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2	
	<i>Nereis mendocinana</i>	2	
	<i>Ophiactis simplex</i>	2	
	<i>Parapleutes pugettensis</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Aplidium</i> sp	3	
	<i>Ceramium camouii</i> Dawson	3	
	<i>Filicrisia</i> sp	3	
	<i>Hiatella arctica</i>	3	
	<i>Leucothoe alata</i>	3	
	<i>Megabalanus californicus</i>	3	
	<i>Metridium exilis</i>	3	

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-A1-I-1	<i>Mytilus</i> spp	3	
(continued)	<i>Obelia plicata</i>	3	
	<i>Pachygrapsus crassipes</i>	3	
GA-A1-I-2	<i>Balanus trigonus</i>	1	
	<i>Hiatella arctica</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Tetraclita rubescens</i>	1	
	<i>Antithamnion hubbsii</i> Dawson	2	
	<i>Chama arcana</i>	2	
	<i>Elasmopus hologurus</i>	2	
	<i>Lithophaga plumula</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Nereis mendocinana</i>	2	
	<i>Ophiactis simplex</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hol	2	
	<i>Caprella equilibra</i>	3	
	<i>Crassostrea gigas</i>	3	
	<i>Monocorophium</i> sp	3	
	<i>Mytilus</i> spp	3	
	<i>Obelia geniculata</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
GA-A1-I-3	<i>Balanus trigonus</i>	1	
	<i>Chama arcana</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Phyllodoce medipapillata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Elasmopus hologurus</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Obelia</i> nr. <i>surcularis</i>	2	
	<i>Tetraclita rubescens</i>	2	
	<i>Arabella iricolor</i>	3	
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	3	
	<i>Mytilus</i> spp	3	
	<i>Pachygrapsus crassipes</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
GA-A1-I-4	<i>Balanus trigonus</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	1	
	<i>Metridium exilis</i>	1	
	<i>Mytilus</i> spp	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-A1-I-4	<i>Spirobranchus spinosus</i>	1	
(continued)	<i>Antithamnion hubbsii</i> Dawson	2	
	<i>Chama arcana</i>	2	
	<i>Hiatella arctica</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Nereis mendocinana</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Tetraclita rubescens</i>	2	
	<i>Filicrisia</i> sp	3	
	<i>Janiropsis tridens</i>	3	
	<i>Pachycheles pubescens</i>	3	
	<i>Phascolosoma agassizi</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
GA-A1-I-5	<i>Balanus trigonus</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Hiatella arctica</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Ophiactis simplex</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Antithamnion hubbsii</i> Dawson	2	
	<i>Chama arcana</i>	2	
	<i>Megabalanus californicus</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Tetraclita rubescens</i>	2	
	<i>Arabella iricolor</i>	3	
	<i>Gregariella coarctata</i>	3	
	<i>Halosydna brevisetosa</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Leucothoe alata</i>	3	
	<i>Lithophaga plumula</i>	3	
	<i>Pachygrapsus crassipes</i>	3	
	<i>Phascolosoma agassizi</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Trypanosyllis</i> sp.	3	
GA-A1-M-10	<i>Balanus trigonus</i>	1	
	<i>Caprella equilibra</i>	3	
	<i>Chama arcana</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Gammaropsis thompsoni</i>	2	
	<i>Halosydna brevisetosa</i>	3	
	<i>Hiatella arctica</i>	2	
	<i>Jassa slatteryi</i>	2	
	<i>Kellia suborbicularis</i>	3	
	<i>Leucothoe alata</i>	3	
	<i>Lithophaga plumula</i>	3	
	<i>Megabalanus californicus</i>	3	

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-A1-M-10	<i>Metridium exilis</i>	2		
(continued)	<i>Metridium senile</i>	1		
	<i>Monocorophium</i> sp	2		
	<i>Mytilus</i> spp	3		
	<i>Ophiothrix spiculata</i>	1		
	<i>Phyllochaetopterus prolifica</i>	3		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Spirobranchus spinosus</i>	1		
	<i>Stronglyocentrotus purpuratus</i>	2		
	<i>Tetraclita rubescens</i>	2		
GA-A1-M-19	<i>Balanus trigonus</i>	1		
	<i>Chama arcana</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Caprella equilibra</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Gammaropsis thompsoni</i>	3		
	<i>Hiatella arctica</i>	3		
	<i>Lithophaga plumula</i>	3		
	<i>Megabalanus californicus</i>	3		
	<i>Monocorophium</i> sp	3		
	<i>Ostrea conchaphila</i>	3		
	<i>Pachygrapsus crassipes</i>	3		
	<i>Phascolosoma agassizi</i>	3		
	<i>Phyllodoce</i> sp.	3		
GA-A1-M-22	<i>Balanus trigonus</i>	1		
	<i>Caprella equilibra</i>	1		
	<i>Chama arcana</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Antithamnion hubbsii</i> Dawson	2		
	<i>Crassadoma gigantea</i>	2		
	<i>Elasmopus hologurus</i>	2		
	<i>Halosydna brevisetosa</i>	2		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2		
	<i>Hiatella arctica</i>	2		
	<i>Lithophaga plumula</i>	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hol	2		
	<i>Acrosorium venulosum</i> (Zanardini) Kylin	3		
	<i>Aplidium</i> sp	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-A1-M-22	<i>Balanus nubilus</i>	3		
(continued)	<i>Branchioglossum bipinnatifidum</i> (Mont.) Wynne	3		
	<i>Callophyllis</i> sp.	3		
	<i>Corynactis californica</i>	3		
	<i>Crisia</i> sp	3		
	<i>Gammaropsis thompsoni</i>	3		
	<i>Jassa slatteryi</i>	3		
	<i>Leucothoe alata</i>	3		
	<i>Megabalanus californicus</i>	3		
	<i>Modiolus capax</i>	3		
	<i>Mytilus</i> spp	3		
	<i>Obelia dichotoma</i>	3		
GA-A1-M-34:	<i>Balanus trigonus</i>	1		
	<i>Chama arcana</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Metridium senile</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Caprella equilibra</i>	2		
	<i>Gammaropsis thompsoni</i>	2		
	<i>Halosydna brevisetosa</i>	2		
	<i>Haplosclerida nr. Haliclona</i> sp	2		
	<i>Hiatella arctica</i>	2		
	<i>Jassa slatteryi</i>	2		
	<i>Lithophaga plumula</i>	2		
	<i>Metridium exilis</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Aplousobranchia (Diplosoma)</i>	3		
	<i>Erichthonius brasiliensis</i>	3		
	<i>Lineus rubescens</i>	3		
	<i>Megabalanus californicus</i>	3		
	<i>Monocorophium</i> sp	3		
	<i>Mytilus</i> spp	3		
	<i>Obelia dichotoma</i>	3		
	<i>Paraxanthias taylori</i>	3		
	<i>Phascolosoma agassizi</i>	3		
	Syllidae	3		
GA-A1-M-35	<i>Balanus trigonus</i>	1		
	<i>Chama arcana</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Antithamnion hubbsii</i> Dawson	2		
	<i>Caprella equilibra</i>	2		
	<i>Gammaropsis thompsoni</i>	2		
	<i>Hiatella arctica</i>	2		
	<i>Jassa slatteryi</i>	2		

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-A1-M-35	<i>Kellia suborbicularis</i>	2		
(continued)	<i>Lithophaga plumula</i>	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hol	2		
	<i>Tetraclita rubescens</i>	2		
	<i>Amphissa reticulata</i> (dead)	3		
	<i>Balanus nubilus</i>	3		
	<i>Ceramium camouii</i> Dawson	3		
	<i>Harmothoe ? hirsuta</i>	3		
	<i>Leucothoe alata</i>	3		
	<i>Monocorophium</i> sp	3		
	<i>Mytilus</i> spp	3		
	<i>Pachygrapsus crassipes</i>	3		
	<i>Phyllochaetopterus prolifica</i>	3		
	<i>Procerarea</i> sp.	3		
	<i>Syllis gracilis</i>	3		
GA-A1+A796-M-3	<i>Balanus trigonus</i>	1		
	<i>Chama arcana</i>	1		
	<i>Diadumene cincta</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Metridium senile</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2		
	<i>Hiatella arctica</i>	2		
	<i>Leucothoe alata</i>	2		
	<i>Lithophaga plumula</i>	2		
	<i>Megabalanus californicus</i>	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Pododesmus cepio</i>	2		
	<i>Halosydna brevisetosa</i>	3		
	<i>Mytilus</i> spp	3		
	<i>Paleonotus bellis</i>	3		
GA-B1-B/S-5	<i>Aplidium</i> sp	1		
	<i>Balanus trigonus</i>	1		
	<i>Chama arcana</i>	1		
	<i>Metridium senile</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2		
	<i>Hiatella arctica</i>	2		
	<i>Lithophaga plumula</i>	2		
	<i>Metridium exilis</i>	2		
	<i>Ophiactis simplex</i>	2		

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
	<i>Ostrea conchaphila</i>	2	
	<i>Balanus nubilus</i>	3	
	<i>Elasmopus hologurus</i>	3	
	<i>Gammaropsis thompsoni</i>	3	
	<i>Kellia suborbicularis</i>	3	
	<i>Leucothoe alata</i>	3	
	<i>Mytilus</i> spp	3	
	<i>Pachygrapsus crassipes</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Phascolosoma agassizi</i>	3	
GA-B1-B/S-6	<i>Aplidium</i> sp	1	
	<i>Balanus trigonus</i>	1	
	<i>Chama arcana</i>	1	
	<i>Diadumene cincta</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Antithamnion hubbsii</i> Dawson	2	
	<i>Caprella equilibra</i>	2	
	<i>Erichthonius brasiliensis</i>	2	
	<i>Gammaropsis thompsoni</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2	
	<i>Nereis mendocinana</i>	2	
	<i>Ophiactis simplex</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Branchioglossum bipinnatifidum</i> (Mont.) Wynne	3	
	<i>Callophyllis</i> sp.	3	
	<i>Ceramium camouii</i> Dawson	3	
	<i>Crisia</i> sp	3	
	<i>Dulichchiella appendiculata</i>	3	
	<i>Filicrisia</i> sp	3	
	<i>Leucothoe alata</i>	3	
	<i>Modiolus capax</i>	3	
	<i>Ophiopteris papillosa</i>	3	
	<i>Phascolosoma agassizi</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
	<i>Pilumnus spinohirsutus</i>	3	
	<i>Pycnogonida</i> , juv	3	
	<i>Quadrimaera reishi</i>	3	
	<i>Stenothoe estacola</i>	3	
	Syllidae	3	
	<i>Syllis gracilis</i>	3	
	<i>Trypanosyllis</i> sp.	3	

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-B1-I-1	<i>Elasmopus hologurus</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Mytilus</i> spp	1	
	<i>Ophiactis simplex</i>	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Tetraclita rubescens</i>	1	
	<i>Caprella equilibra</i>	2	
	<i>Nereis mendocinana</i>	2	
	<i>Ophiothrix spiculata</i>	2	
	<i>Pachygrapsus crassipes</i>	2	
	<i>Aplousobranchia (Diplosoma)</i>	3	
	<i>Arabella iricolor</i>	3	
	<i>Balanus trigonus</i>	3	
	<i>Halosydna brevisetosa</i>	3	
	<i>Haplosclerida nr. Haliclona</i> sp	3	
	<i>Leucothoe alata</i>	3	
	<i>Obelia geniculata</i>	3	
	<i>Ostrea conchaphila</i>	3	
	<i>Trypanosyllis</i> sp.	3	
GA-B1-I-2	<i>Chama arcana</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Jassa slatteryi</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Mytilus</i> spp	1	
	<i>Ophiactis simplex</i>	1	
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Tetraclita rubescens</i>	1	
	<i>Caprella equilibra</i>	2	
	<i>Halosydna brevisetosa</i>	2	
	<i>Ostrea conchaphila</i>	2	
	<i>Pachygrapsus crassipes</i>	2	
	<i>Phyllodoce medipapillata</i>	2	
	<i>Balanus trigonus</i>	3	
	<i>Parapleutes pugettensis</i>	3	
	<i>Phyllochaetopterus prolifica</i>	3	
<i>Stenothoe estacola</i>	3		
GA-B1-I-3	<i>Balanus trigonus</i>	1	
	<i>Elasmopus hologurus</i>	1	
	<i>Megabalanus californicus</i>	1	
	<i>Metridium exilis</i>	1	
	<i>Mytilus</i> spp	1	
	<i>Ophiothrix spiculata</i>	1	
	<i>Spirobranchus spinosus</i>	1	
	<i>Tetraclita rubescens</i>	1	
	<i>Caprella equilibra</i>	2	

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-B1-I-3	<i>Chama arcana</i>	2		
(continued)	<i>Jassa slatteryi</i>	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Aplousobranchia (Diplosoma)</i>	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Ostrea conchaphila</i>	3		
	<i>Pachygrapsus crassipes</i>	3		
	<i>Parapleutes pugettensis</i>	3		
	<i>Pododesmus cepio</i>	3		
	<i>Stenothoe estacola</i>	3		
GA-B1-M-9	<i>Elasmopus hologurus</i>	1		
	<i>Hiatella arctica</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Metridium senile</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Balanus trigonus</i>	2		
	<i>Caprella equilibra</i>	2		
	<i>Jassa slatteryi</i>	2		
	<i>Mytilus</i> spp	2		
	<i>Ophiactis simplex</i>	2		
	<i>Aplousobranchia (Diplosoma)</i>	3		
	<i>Crisia</i> sp	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	3		
	<i>Lithophaga plumula</i>	3		
	<i>Megabalanus californicus</i>	3		
	<i>Phascolosoma agassizi</i>	3		
	<i>Spirobranchus spinosus</i>	3		
GA-B1-M-12	<i>Balanus trigonus</i>	1		
	<i>Caprella equilibra</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Hiatella arctica</i>	1		
	<i>Jassa slatteryi</i>	1		
	<i>Lithophaga plumula</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Metridium senile</i>	1		
	<i>Mytilus</i> spp	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Gammaropsis thompsoni</i>	2		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2		
	<i>Kellia suborbicularis</i>	2		
	<i>Monocorophium</i> sp	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phascolosoma agassizi</i>	2		

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-B1-M-12	<i>Phyllodoce medipapillata</i>	2		
(continued)	<i>Chama arcana</i>	3		
	<i>Filicrisia</i> sp	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Harmothoe ? hirsuta</i>	3		
	<i>Leucothoe alata</i>	3		
	<i>Modiolus capax</i>	3		
	<i>Paraxanthias taylori</i>	3		
	<i>Syllis gracilis</i>	3		
	<i>Trypanosyllis</i> sp.	3		
GA-B1-M-18	<i>Balanus trigonus</i>	1		
	<i>Caprella equilibra</i>	1		
	<i>Chama arcana</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Lithophaga plumula</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Gammaropsis thompsoni</i>	2		
	<i>Haplosclerida nr. Haliclona</i> sp	2		
	<i>Jassa slatteryi</i>	2		
	<i>Leucothoe alata</i>	2		
	<i>Monocorophium</i> sp	2		
	<i>Mytilus</i> spp	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Polysiphonia scopulorum</i> var. <i>villosum</i> (J. Ag.) Hol	2		
	<i>Aplidium</i> sp	3		
	<i>Arabella iricolor</i>	3		
	<i>Branchioglossum bipinnatifidum</i> (Mont.) Wynne	3		
	<i>Ceramium camouii</i> Dawson	3		
	Doridacea	3		
	<i>Filicrisia</i> sp	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Hiatella arctica</i>	3		
	<i>Holothuroidea</i> juv unid	3		
	<i>Janiropsis tridens</i>	3		
	<i>Kellia suborbicularis</i>	3		
	<i>Megabalanus californicus</i>	3		
	<i>Musculus</i> sp damaged	3		
	Mysidacea frag	3		
	<i>Pachygrapsus crassipes</i>	3		
	<i>Parapleutes pugettensis</i>	3		
	<i>Paraxanthias taylori</i>	3		
	<i>Phascolosoma agassizi</i>	3		
	<i>Phyllochaetopterus prolifica</i>	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-B1-M-18	<i>Pugettia</i> sp juv	3		
(continued)	<i>Syllis gracilis</i>	3		
	<i>Tetrastemma signifer</i>	3		
GA-B1-M-24	<i>Elasmopus hologurus</i>	1		
	<i>Megabalanus californicus</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Metridium senile</i>	1		
	<i>Mytilus</i> spp	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Antithamnion hubbsii</i> Dawson	2		
	<i>Balanus trigonus</i>	2		
	<i>Caprella equilibra</i>	2		
	<i>Chama arcana</i>	2		
	<i>Halosydna brevisetosa</i>	2		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2		
	<i>Hiatella arctica</i>	2		
	<i>Kellia suborbicularis</i>	2		
	<i>Lithophaga plumula</i>	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Ceramium camouii</i> Dawson	3		
	<i>Filicrisia</i> sp	3		
	<i>Gregariella coarctata</i>	3		
	<i>Jassa slatteryi</i>	3		
	<i>Monocorophium</i> sp	3		
	<i>Pachygrapsus crassipes</i>	3		
	<i>Paleonotus bellis</i>	3		
	<i>Parapleutes pugettensis</i>	3		
	<i>Syllis gracilis</i>	3		
GA-B1-M-25	<i>Balanus trigonus</i>	1		
	<i>Chama arcana</i>	1		
	<i>Diadumene cincta</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Metridium exilis</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Aplidium</i> sp	2		
	<i>Halosydna brevisetosa</i>	2		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	2		
	<i>Leucothoe alata</i>	2		
	<i>Mytilus</i> spp	2		
	<i>Nereis mendocinana</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Acrosorium venulosum</i> (Zanardini) Kylin	3		
	<i>Ceramium camouii</i> Dawson	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-B1-M-25	<i>Harmothoe</i> sp.	3		
(continued)	<i>Megabalanus californicus</i>	3		
	<i>Paraxanthias taylori</i>	3		
	<i>Phascolosoma agassizi</i>	3		
	<i>Phyllochaetopterus prolifica</i>	3		
GA-B1-M-29	<i>Balanus trigonus</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Lithophaga plumula</i>	1		
	<i>Mytilus</i> spp	1		
	<i>Ophiactis simplex</i>	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Phascolosoma agassizi</i>	1		
	<i>Spirobranchus spinosus</i>	1		
	<i>Aplidium</i> sp	2		
	<i>Caprella equilibra</i>	2		
	<i>Hiatella arctica</i>	2		
	<i>Jassa slatteryi</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Aplousobranchia (Diplosoma)</i>	3		
	<i>Balanus nubilus</i>	3		
	cf. <i>Sinocorophium</i> sp	3		
	<i>Gammaropsis thompsoni</i>	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Kellia suborbicularis</i>	3		
	<i>Leucothoe alata</i>	3		
	<i>Monocorophium</i> sp	3		
	<i>Pachycheles pubescens</i>	3		
	<i>Phyllochaetopterus prolifica</i>	3		
	<i>Seila montereyensis</i>	3		
	<i>Syllis gracilis</i>	3		
GA-B1-M-30	<i>Elasmopus hologurus</i>	1		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	1		
	<i>Kellia suborbicularis</i>	1		
	<i>Metridium senile</i>	1		
	<i>Ophiactis simplex</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Balanus trigonus</i>	2		
	<i>Caprella equilibra</i>	2		
	<i>Gammaropsis thompsoni</i>	2		
	<i>Leucothoe alata</i>	2		
	<i>Lithophaga plumula</i>	2		
	<i>Metridium exilis</i>	2		
	<i>Monocorophium</i> sp	2		
	<i>Ophiothrix spiculata</i>	2		
	<i>Acrosorium venulosum</i> (Zanardini) Kylin	3		
	<i>Aplidium</i> sp	3		
	<i>Harmothoe ? hirsuta</i>	3		
	<i>Hiatella arctica</i>	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat				
Station/Quadrat	Species or Taxon	Relative Abundance		
GA-B1-M-30	<i>Jassa slatteryi</i>	3		
(continued)	<i>Mytilus</i> spp	3		
	<i>Naineris dentritica</i>	3		
	<i>Phascolosoma agassizi</i>	3		
	<i>Phyllochaetopterus prolifica</i>	3		
GA-B1-M-33	<i>Balanus trigonus</i>	1		
	<i>Caprella equilibra</i>	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	1		
	<i>Lithophaga plumula</i>	1		
	<i>Metridium senile</i>	1		
	<i>Monocorophium</i> sp	1		
	<i>Ophiothrix spiculata</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Diadumene cincta</i>	2		
	<i>Gammaropsis thompsoni</i>	2		
	<i>Leucothoe alata</i>	2		
	<i>Metridium exilis</i>	2		
	<i>Ophiactis simplex</i>	2		
	<i>Phyllodoce medipapillata</i>	2		
	<i>Acrosorium venulosum</i> (Zanardini) Kylin	3		
	<i>Aplidium</i> sp	3		
	<i>Aplousobranchia</i> (<i>Diplosoma</i>)	3		
	<i>Chama arcana</i>	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Harmothoe ? hirsuta</i>	3		
	<i>Hiatella arctica</i>	3		
	<i>Kellia suborbicularis</i>	3		
	<i>Mytilus</i> spp	3		
	<i>Naineris dentritica</i>	3		
	<i>Pilumnus spinohirsutus</i>	3		
	<i>Syllis gracilis</i>	3		
GA-B1-M-34	<i>Aplidium</i> sp	1		
	<i>Elasmopus hologurus</i>	1		
	<i>Haplosclerida</i> nr. <i>Haliclona</i> sp	1		
	<i>Mytilus</i> spp	1		
	<i>Ophiactis simplex</i>	1		
	<i>Pterosiphonia dendroidea</i> (Mont.) Falk.	1		
	<i>Balanus trigonus</i>	2		
	<i>Kellia suborbicularis</i>	2		
	<i>Leucothoe alata</i>	2		
	<i>Metridium exilis</i>	2		
	<i>Ophiothrix spiculata</i>	2		
	<i>Caprella equilibra</i>	3		
	<i>Halosydna brevisetosa</i>	3		
	<i>Harmothoe ? hirsuta</i>	3		
	<i>Iselica</i> sp	3		
	<i>Jassa slatteryi</i>	3		

PLATFORM GAIL - Taxa by Individual Station/Quadrat			
Station/Quadrat	Species or Taxon	Relative Abundance	
GA-B1-M-34	<i>Lithophaga plumula</i>	3	
(continued)	<i>Monocorophium</i> sp	3	
	<i>Parapleutes pugettensis</i>	3	
	<i>Paraxanthias taylori</i>	3	
	<i>Phascolosoma agassizi</i>	3	

Appendix E
Data Appendix: PointCount'99[®] Analysis

Appendix E has been organized into three primary sections:

- Table E-1 – this one-page table summarizes the dominant species or taxa identified during the PointCount'99® analysis and indicates which taxa were also identified during either quantitative slide analysis or scraping analysis.
- Table E-2 – this four-page table summarizes the dominant taxa identified during PointCount'99® analysis. Summary data include mean, minimum, maximum, frequency of occurrence, and whether each taxon was also identified as a QSA dominant.
- PointCount'99® Data Appendix, Sum of Counts – separate spreadsheets (each containing four to six pages) have been developed for the 10 platform legs summarizing the observations from the PointCount'99® analysis. Separate spreadsheets are provided for each platform leg. Site identifiers are located in the upper left corner of each spreadsheet (e.g., Platform Gail, Leg A1: Sum of Counts). Within each spreadsheet, data are organized by water depth (i.e., from shallowest to deepest) in the horizontal plane. In the vertical plane, data are organized by dominant taxa (i.e., highest average counts), in descending order. Summary data (i.e., average, minimum, maximum, and frequency of occurrence) are provided on the last page of each separate set of spreadsheets.

Table E-1. Dominant species or taxa from the PointCount'99® analysis (31 taxa total) and their occurrence in quantitative slide analyses (QSA) or scraping samples.

PointCount'99® Taxa	Present in QSA	Present in Scrapings
<i>Aglaophenia</i> sp.	N	N
<i>Anthopleura elegantissima</i> (rosy morph)	Y	Y
<i>Balanus</i> spp.	Y	Y
Bryozoa erect	Y	Y
<i>Cancer</i> spp.	Y	Y
<i>Coenocyathus bowersi</i>	Y	N
<i>Corynactis californica</i>	Y	Y
<i>Desmophyllum dianthus</i>	Y	N
Encruster	Y	P
Fan Worm	Y - Sabellidae/Serpulidae unidentified	Y
<i>Florometra serratissima</i>	Y	N
<i>Galathea californiensis</i>	Y	N
Green Algae	Y	Y
Macroalgae	P	P
<i>Metridium exilis</i>	Y	Y
<i>Metridium farcimen</i>	Y	N
<i>Metridium senile</i>	Y	Y
<i>Mytilus</i> spp.	Y	Y
<i>Obelia</i> sp.	Y	Y
<i>Ophionereis</i> sp.	N	N
<i>Ophiothrix spiculata</i>	Y	Y
<i>Paracyathus stearnsii</i>	Y	N
<i>Pisaster</i> sp.	Y	N
<i>Pleurobranchaea californica</i>	Y	N
<i>Pollicipes polymerus</i>	Y	N
Porifera	Y - Sponge, [color descriptor]	Y
Porifera, erect	Y - Sponge, [form descriptor]	P
Red Algae	Y	Y
Rockfish	Y - <i>Sebastes</i> spp.	N
Turf	Y	N
Zoanthidea	Y	N

Key: Y - yes; N - no; P - possible

Notes:

- Dominant taxa included above represent the top 12 taxa found on each platform leg (see **Table 3-14**).
- Broader taxonomic categories may have been used on occasion during point count analysis; corresponding taxon/descriptor used during QSA noted, as appropriate.

Table E-2. Dominant taxa on the six platforms as determined by PointCount'99® analysis.

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Platform Gail:						
Leg A1 - 111 images	<i>Corynactis californica</i>	31.21	1	50	38/111	Y
	<i>Metridium senile</i>	18.88	1	47	67/111	Y
	<i>Desmophyllum dianthus</i>	15.29	1	30	17/111	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	14.85	1	50	13/111	Y
	Red Algae	14.62	2	33	26/111	Y
	<i>Mytilus</i> spp.	12.43	1	24	14/111	Y
	Zoanthidea	11.71	3	42	7/111	Y
	<i>Metridium farcimen</i>	10.20	1	34	5/111	Y
	Turf	9.86	1	35	83/111	Y
	<i>Metridium exilis</i>	8.90	1	30	30/111	Y
	<i>Ophiothrix spiculata</i>	4.25	1	10	88/111	Y
<i>Aglaophenia</i> sp.	4.00	4	4	1/111	N	
Leg B1 - 110 images	<i>Metridium exilis</i>	29.83	1	48	63/110	Y
	Turf	20.52	1	46	62/110	Y
	<i>Corynactis californica</i>	17.30	1	48	23/110	Y
	<i>Metridium senile</i>	14.31	1	34	35/110	Y
	<i>Pleurobranchaea californica</i>	9.00	9	9	1/110	N
	<i>Desmophyllum dianthus</i>	8.82	1	27	17/110	Y
	Red Algae	8.30	1	25	20/110	Y
	<i>Metridium farcimen</i>	8.00	8	8	1/110	N
	<i>Mytilus</i> spp.	7.47	1	22	17/110	Y
	Porifera	5.16	1	16	45/110	Y
	<i>Ophiothrix spiculata</i>	3.75	1	9	4/110	Y
Zoanthidea	3.75	1	6	4/110	Y	
Platform Grace:						
Leg C1 - 94 images	<i>Corynactis californica</i>	23.69	1	45	42/94	Y
	Turf	18.32	1	47	81/94	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	17.30	1	43	20/94	Y
	<i>Metridium farcimen</i>	13.50	13	14	2/94	N
	<i>Mytilus</i> spp.	12.37	1	26	19/94	Y
	<i>Obelia</i> sp.	11.83	1	26	18/94	N
	Red Algae	9.92	1	28	24/94	Y
	<i>Paracyathus stearnsii</i>	7.91	1	26	23/94	Y
	<i>Ophiothrix spiculata</i>	6.33	1	12	12/94	Y
	Rockfish	5.00	5	5	1/94	N
	<i>Metridium senile</i>	4.67	1	11	3/94	Y
	<i>Ophionereis</i> sp.	4.67	1	12	6/94	N

Table E-2. Dominant taxa on the six platforms as determined by PointCount'99® analysis (continued).

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Leg C4 - 94 images	<i>Corynactis californica</i>	39.14	5	50	37/94	Y
	Zoanthidea	21.17	4	42	6/94	Y
	<i>Metridium senile</i>	20.55	1	45	38/94	Y
	<i>Metridium farcimen</i>	18.89	1	40	9/94	Y
	<i>Mytilus</i> spp.	15.00	1	29	25/94	Y
	Turf	10.99	1	35	72/94	Y
	<i>Metridium exilis</i>	8.00	4	14	3/94	Y
	Red Algae	7.37	1	15	19/94	Y
	<i>Ophiothrix spiculata</i>	6.93	1	20	28/94	Y
	Green Algae	6.50	4	9	2/94	N
	<i>Anthopleura elegantissima</i> (rosy morph)	6.23	1	13	13/94	Y
	<i>Obelia</i> sp.	4.50	1	11	4/94	N
Platform Harvest:						
Leg B1 - 94 images	<i>Metridium senile</i>	23.65	1	48	79/94	Y
	<i>Metridium farcimen</i>	22.67	5	50	3/94	Y
	<i>Pisaster</i> sp.	20.00	20	20	1/94	N
	Turf	19.75	1	49	77/94	Y
	<i>Corynactis californica</i>	16.00	1	48	5/94	Y
	<i>Mytilus</i> spp.	12.50	1	25	18/94	Y
	Porifera	7.47	1	34	43/94	Y
	Red Algae	5.82	1	11	17/94	Y
	Macroalgae	5.00	2	8	2/94	N
	<i>Anthopleura elegantissima</i> (rosy morph)	4.91	1	11	11/94	Y
	Bryozoa erect	4.00	4	4	1/94	Y
	Encruster	3.84	1	14	25/94	Y
Leg B2 - 90 images	Turf	17.81	1	43	81/90	Y
	<i>Metridium senile</i>	17.09	1	38	76/90	Y
	<i>Mytilus</i> spp.	11.67	2	22	21/90	Y
	Porifera	10.73	1	32	37/90	Y
	<i>Corynactis californica</i>	8.33	1	21	6/90	Y
	Red Algae	7.67	1	19	9/90	Y
	Encruster	7.63	1	32	54/90	Y
	Porifera, erect	7.00	7	7	1/90	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	6.80	1	15	15/90	Y
	<i>Ophiothrix spiculata</i>	6.47	1	19	15/90	Y
	<i>Obelia</i> sp.	5.50	3	8	2/90	N
	<i>Galathea californiensis</i>	3.33	1	6	3/90	N

Table E-2. Dominant taxa on the six platforms as determined by PointCount'99® analysis (continued).

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Platform Hidalgo:						
Leg A1 - 64 images	<i>Metridium senile</i>	23.85	1	47	60/64	Y
	<i>Mytilus</i> spp.	18.23	4	31	13/64	Y
	Turf	13.57	1	30	37/64	Y
	<i>Metridium farcimen</i>	10.33	4	21	3/64	Y
	Porifera	8.76	1	32	46/64	Y
	Porifera, erect	7.50	5	10	2/64	Y
	<i>Corynactis californica</i>	6.40	2	17	5/64	Y
	<i>Ophiothrix spiculata</i>	5.09	1	21	33/64	Y
	<i>Pisaster</i> sp.	5.00	2	8	4/64	Y
	Encruster	4.57	1	26	35/64	Y
	Red Algae	4.50	3	6	2/64	Y
	Fan Worm	2.50	1	4	2/64	N
Leg B1 - 84 images	<i>Anthopleura elegantissima</i> (rosy morph)	28.50	2	45	8/84	Y
	<i>Mytilus</i> spp.	22.83	3	36	23/84	Y
	<i>Metridium senile</i>	19.82	1	47	66/84	Y
	Turf	18.40	1	50	65/84	Y
	<i>Metridium farcimen</i>	8.50	5	12	2/84	Y
	Porifera	7.93	1	23	44/84	Y
	<i>Ophiothrix spiculata</i>	6.11	1	19	28/84	Y
	Encruster	5.97	1	32	38/84	Y
	Porifera, erect	5.50	1	10	2/84	N
	<i>Cancer</i> sp.	5.00	5	5	1/84	N
	<i>Florometra serratissima</i>	5.00	5	5	1/84	N
	<i>Pisaster</i> sp.	4.50	1	7	4/84	Y
Platform Habitat:						
Leg A1 - 75 images	<i>Corynactis californica</i>	37.05	2	50	37/75	Y
	Zoanthidea	29.67	2	50	6/75	Y
	<i>Metridium farcimen</i>	27.55	1	50	11/75	Y
	<i>Mytilus</i> spp.	15.29	1	35	21/75	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	15.07	5	49	14/75	Y
	<i>Metridium senile</i>	11.44	1	39	27/75	Y
	Turf	7.90	1	47	60/75	Y
	Red Algae	6.81	1	24	21/75	Y
	Rockfish	4.00	1	7	2/75	N
	<i>Ophiothrix spiculata</i>	3.83	1	12	18/75	Y
	<i>Coenocyathus bowersi</i>	3.36	1	9	11/75	N
	<i>Paracyathus stearnsii</i>	3.33	1	8	9/75	Y

Table E-2. Dominant taxa on the six platforms as determined by PointCount'99® analysis (continued).

Platform and Leg	Dominant Taxa	Mean	Minimum	Maximum	Frequency	QSA Dominant
Platform Irene:						
Leg A1 - 67 images	<i>Metridium senile</i>	28.69	2	50	59/67	Y
	<i>Metridium farcimen</i>	21.00	21	21	1/67	Y
	<i>Mytilus</i> spp.	14.83	1	28	40/67	Y
	Porifera	9.03	1	24	31/67	Y
	Turf	7.33	1	27	48/67	Y
	Red Algae	5.91	1	24	11/67	Y
	<i>Balanus</i> spp.	5.12	1	14	17/67	Y
	Green Algae	4.00	4	4	1/67	Y
	<i>Pollicipes polymerus</i>	3.50	1	6	2/67	Y
	<i>Pisaster</i> sp.	3.11	1	6	9/67	Y
	<i>Anthopleura elegantissima</i> (rosy morph)	2.50	1	4	6/67	Y
	<i>Cancer</i> sp.	2.25	1	3	4/67	Y

Platform Irene, Leg A1: Sum of Counts		File Name and Water Depth (ft)																		
Taxon	I/AA0101.jpg	I/AA0112.jpg	I/AA0119.jpg	I/AA0111.jpg	I/AA0122.jpg	I/AA0113.jpg	I/AA0120.jpg	I/AA0110.jpg	I/AA0115.jpg	I/AA0116.jpg	I/AA0117.jpg	I/AA0121.jpg	I/AA0118.jpg	I/AA0109.jpg	I/AA0114.jpg	I/AA0108.jpg	I/AA0107.jpg	I/AA0106.jpg	I/AA0105.jpg	I/AA0104.jpg
	0	1	1.1	2	2.1	3	3.1	4	4.1	4.2	4.3	4.4	6	8	8.1	9	10	11	13	14
Voucher Shot	50																			
Metridium senile				25		10		21	10	3	8	2		18	29	12	27	27	28	35
Metridium farcimen																				
Mytilus spp		22	11	17	12	16	19	17	22	22	20	27	22	27	10	12	16	17	17	12
Porifera																				
Turf		8	10	7	9	20	6	3	17	9	19	5	10	3	11	22	7	6	4	3
Red Algae		10	13		24	1	8	1				4		1						
Balanus spp		10	13	1	3	2	9	7		7	3	12	14			1				
Green Algae							4													
Pollicipes polymerus							1			6										
Pisaster sp																				
Anthopleura elegantissima										3			1							
Cancer sp																				
Corynactis californica													2							
Fan Worm																				
Questionable/unknown			2		1		2	1	1				1							
Encruster			1		1		1							1		1				
Anthozoa						1														
Asterina																				
Macroalgae																				
Shadow																1			1	
Strongylocentrotus purpuratus																1				
Total	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Platform Irene, Leg A1: Sum of Counts																				
Taxon	IRA40528.jpg	IRA40526.jpg	IRA40527.jpg	IRA40525.jpg	IRA40524.jpg	IRA40523.jpg	IRA40522.jpg	IRA40521.jpg	IRA40520.jpg	IRA40519.jpg	IRA40518.jpg	IRA40517.jpg	IRA40516.jpg	IRA40515.jpg	IRA40514.jpg	IRA40513.jpg	IRA40512.jpg	IRA40511.jpg	IRA40510.jpg	IRA40509.jpg
	58	62	62.1	65	68	71	75	79	98	113	115	131	142	146	151	154	170	173	179	182
Voucher Shot																				
Metridium senile	40	43	37	44	44	32	29	34	32	23	37	26	40	37	31	32	28	30	33	39
Metridium farcimen																				
Mytilus spp		1						1												
Porifera	7	4	3	3	4	7	18	14	14	21	12	23	9	12	14	8	8	6	10	10
Turf		1	7			6									2	8	10	13	3	
Red Algae																				
Balanus spp			1		1					1										
Green Algae																				
Pollicipes polymerus																				
Pisaster sp										2									1	
Anthopleura elegantissima																				
Cancer sp				3																
Corynactis californica																				
Fan Worm						2														
Questionable/unknown			1		1		2	1	3	3		1	1	1	1	2	4	1	3	1
Encruster	3	1	1			3			1		1				2					
Anthozoa																				
Asterina																				
Macroalgae																				
Shadow						1														
Strongylocentrotus purpuratus																				
Total	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50

Platform Irene, Leg A1: Sum of Counts											
Taxon	IR440508.jpg	IR440507.jpg	IR440505.jpg	IR440506.jpg	IR440504.jpg	IR440503.jpg	IR440502.jpg	avg	min	max	freq
	189	201	206	206.1	215	221	232	67	images		
Voucher Shot							50	50.00	50	50	2
Metridium senile	45	47	37	50	37			28.69	2	50	59
Metridium farcimen						21		21.00	21	21	1
Mytilus spp								14.83	1	28	40
Porifera	1	2						9.03	1	24	31
Turf	4	1	11		11	27		7.33	1	27	48
Red Algae								5.91	1	24	11
Balanus spp								5.12	1	14	17
Green Algae								4.00	4	4	1
Pollicipes polymerus								3.50	1	6	2
Pisaster sp								3.11	1	6	9
Anthopleura elegantissima								2.50	1	4	6
Cancer sp								2.25	1	3	4
Corynactis californica								2.00	2	2	1
Fan Worm								2.00	2	2	1
Questionable/unknown			2		2	1		1.61	1	4	36
Encruster								1.50	1	3	18
Anthozoa								1.00	1	1	1
Asterina						1		1.00	1	1	1
Macroalgae								1.00	1	1	1
Shadow								1.00	1	1	3
Strongylocentrotus purpuratus								1.00	1	1	1
Total	50	50	50	50	50	50	50				

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (<i>Leave blank</i>)		2. REPORT DATE December 2005	3. REPORT TYPE AND DATES COVERED Final report	
4. TITLE AND SUBTITLE Survey of Invertebrate and Algal Communities on Offshore Oil and Gas Platforms in Southern California			5. FUNDING NUMBERS C: 1435-01-98-CT-30865	
6. AUTHORS Continental Shelf Associates, Inc.				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Continental Shelf Associates, Inc. 759 Parkway Street Jupiter, FL 33477			8. PERFORMING ORGANIZATION REPORT NUMBER 1665	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) Minerals Management Service Pacific OCS Region 770 Paseo Camarillo Camarillo, CA 93010			10. SPONSORING/MONITORING AGENCY REPORT NUMBER OCS Study MMS 2005-070	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT			12b. DISTRIBUTION CODE	
13. ABSTRACT (<i>Maximum 200 words</i>) The final report characterizes invertebrate and algal communities present on six oil/gas platforms and two natural hard bottom communities in OCS waters offshore southern California. Platforms were located at both shallow and deeper water sites in the Santa Barbara Channel and Santa Maria Basin. Photographic images (image area: 1/16 square meter) and videotape data were acquired via both remotely operated vehicle and scientific divers along one or two platform legs, between the intertidal zone and the platform base. Limited scraping of 1/16 square meter quadrats was also completed at two platforms, allowing for characterization of the complex interstitial community present in platform mussel (<i>Mytilus</i> spp.) beds. The structure of platform-associated communities was determined. More than 800 photographic images were subjected to whole slide and random point count analyses, producing both density and percent cover estimates. Dominant taxa were identified and depth zonation patterns were presented. Clustering and correspondence analyses were also completed. Wet weights and detailed enumerations of mussels were presented and discussed. Species diversity, dominant taxa, and depth patterns for platform-associated invertebrate and algal communities were summarized. Inter- and intra-platform variability was assessed, and platform taxa were compared to natural hard bottom communities.				
14. SUBJECT TERMS Oil and gas, platforms, Santa Barbara Channel, Santa Maria Basin, California, hard bottom, field surveys, invertebrates, algae, dominant, density, percent cover, zonation, photoquadrat, random point count analysis, whole slide analysis, scraping, mussels, <i>Mytilus</i> , wet weight, interstitial, correspondence analysis, clustering analysis			15. NUMBER OF PAGES 232 pp. + appendices	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT Unclassified	18. SECURITY CLASSIFICATION OF THIS PAGE Unclassified	19. SECURITY CLASSIFICATION OF ABSTRACT Unclassified	20. LIMITATION OF ABSTRACT SAR	



The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Minerals Revenue Management** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.