

APPENDICES

APPENDIX 1. Platform Synopses

In this section, we give a brief summary of each of the California platforms. The platforms are listed from the most northwest, Irene, off Point Arguello, to Emmy in the southeast off Long Beach.

Wherever possible, we have included the following information on each platform: (1) the original operator; (2) the current operator of record; (3) the date the platform was installed; (4) the first production date; (5) the platform's distance from shore (including whether it is in state or outer continental shelf [OCS] waters); (6) the bottom depth of the platform; (7) the number of wells; (8) what the platform produces (oil and/or gas); (9) the platform jacket dimensions (generally at the seafloor [bottom]); (10) the size of the shell mound surrounding the platform; (11) the size of the platform's footprint. This data was taken from California Resources Agency (1971), Manago and Williamson (1998), Holbrook et al. (2000), and Sea Surveyor Inc. (2001). We have also included a photograph of most of the platforms and their locations including latitude and longitude.

We follow this with a synopsis of the fish assemblages around each platform. When these summaries are based on our scuba and submersible surveys we include the years these surveys were conducted. Scuba surveys are midwater surveys except at the shallow water Platform Gina. Because of funding limitations, a number of platforms were surveyed only once and in a number of instances poor water visibility prevented complete coverage. Neither ExxonMobil nor Aera gave us permission to survey their platforms. In some instances, we were able to review videos that were taken during mandatory platform inspections. From these, we made a qualitative estimate of platform bottom fish assemblages for those platforms we were unable to survey.



IRENE

Original operator: Union; current operator of record: Nuevo Energy; date installed: 1985; first production: 1987; distance from shore (miles): 4.7 (OCS); water depth: 73 m (242 ft.); number of well slots 72; produces: oil and gas; platform jacket dimensions: 47 x 56 m (155 x 185 ft.) (bottom); platform footprint (m²): 2,633; location: 120°43.45'N, 34°36.37'W.

Dates and types of surveys:

Scuba: 1995–2000

Submersible:

	Midwater	Bottom	Shell Mound
1995	x		
1996	x	x	x
1997	x	x	x
1998	x	x	x
1999	x	x	x
2000	x	x	x
2001	x	x	x



Platform Irene's midwaters consistently harbored large numbers of YOY (young-of-the-year) and older juvenile rockfishes. Bocaccio, blue, shortbelly, squarespot, treefish, and widow rockfishes, and the complex comprised of young black-and-yellow, copper, gopher, and kelp rockfishes, were abundant. Densities of these fishes were usually among the highest we observed around either platforms or natural outcrops. Young painted greenling, living on the jacket, were also quite abundant. During the 1998 El Niño, YOY blacksmith settled on the platform in large numbers. However, they were gone by the following year. Kelp greenling recruited as young-of-the-year in 1999; they swam to the platform bottom during the next year and were there through 2001. Two pelagic species, jack mackerel and Pacific sardine, were also occasionally seen in high numbers. The platform bottom had particularly high densities of halfbanded rockfish and YOY rockfishes, as well as subadult and adult copper, vermilion, calico, and brown rockfishes. Juvenile lingcod, pile perch and painted greenling were also very abundant and Pacific sanddab, canary and yellowtail rockfishes were frequently seen. On the shell mound, halfbanded and copper rockfish, as well as young lingcod were very common. Platform Irene is particularly noteworthy as it harbored far higher densities of young lingcod than did any other site (platform or natural outcrop) that we surveyed.

HIDALGO

Original operator: Chevron; current operator of record: Arguello Inc.; date installed: 1986; first production: 1991; distance from shore (miles): 5.9 (OCS); water depth: 130 m (430 ft.); number of well slots: 56; produces: oil and gas; platform jacket dimensions: 78 x 53 m (257 x 176 ft.) (bottom); platform footprint (m²): 4,154; location: 34°29'N, 120°42'W.

Dates and types of surveys:

Scuba: 1996–2000

Submersible:

	Midwater	Bottom	Shell Mound
1996	x	x	x
1997	x	x	x
1998	x	x	x
1999	x	x	x
2000	x	x	x
2001	x	x	x



We observed high densities of YOY and older juvenile rockfishes in the midwaters of Platform Hidalgo. A number of rockfishes, including blue, copper, gopher, kelp, olive, rosy, squarespot, and widow rockfishes and bocaccio were abundant. Halfmoon and young painted greenling were also common. Large numbers of YOY blacksmith recruited to the platform during 1998 and remained there through 2001. Similarly, kelp greenling young settled during 1999, and some remained through 2001. Jack mackerel and northern anchovy were occasional visitors. The bottom of this platform was dominated by halfbanded, greenspotted, and flag rockfishes, YOY rockfishes, and lingcod. Flag rockfish density was higher than at any natural outcrop or other platform. Other important species included canary, greenstriped, vermilion, and widow rockfishes and painted greenling. On the shell mounds, we noted extremely large numbers of halfbanded rockfish. Both juvenile and adult lingcod were also abundant.

HARVEST

Original operator: Texaco; current operator of record: Arguello Inc.; date installed: 1985; first production: 1991; distance from shore (miles): 6.7 (OCS); water depth: 205 m (675 ft.); number of well slots: 50; produces: oil and gas; platform jacket dimensions: 61 x 97 m (200 x 319 ft.) (bottom); platform footprint (m²): 5,859; location: 34°28'N, 120°40'W.

Dates and types of surveys:

Scuba: 1996–2000

Submersible:

	Midwater	Bottom	Shell Mound
1996	x		
1997	x	x	x
1998	x	x	x
1999	x	x	x
2000	x	x	x
2001			



As on most of the other platforms we surveyed, YOY and somewhat older rockfishes characterized the midwaters of Platform Harvest. Of these, bocaccio, as well as blue, olive, squarespot, and widow rockfishes were most abundant. Young painted greenling, as well as halfmoon, also were seen frequently. Blacksmith were abundant, they had recruited in 1998 as YOY and remained at the platform through 2001. Large numbers of kelp greenling settled from the plankton in 1999. Pelagic species, such as northern anchovy and Pacific sardine, were occasional visitors. In the deeper midwaters, we saw many sharpchin and whitespeckled rockfishes. Stripetail, greenstriped, greenspotted, and greenblotched rockfishes and lingcod were commonly seen on the bottom. Stripetail, greenstriped and sharpchin rockfishes were most abundant on the shell mounds.

HERMOSA

Original operator: Chevron; current operator of record: Arguello Inc.; date installed: 1985; first production: 1991; distance from shore (miles): 6.8 (OCS); water depth: 183 m (603 ft.); number of well slots: 48; produces: oil and gas; platform jacket dimensions: 61 x 85 m (200 x 280 ft.) (bottom); platform footprint (m²): 5,142; location: 34°27'N, 120°38'W.

Dates and types of surveys:

Scuba: 1996–2000

Submersible:

	Midwater	Bottom	Shell Mound
1996	x	x	
1997	x	x	x
1998	x	x	x
1999	x	x	x
2000	x	x	x
2001			



Platform Hermosa's midwaters are noteworthy as rockfish nursery grounds. They harbored the second highest densities of YOY rockfishes of any site we surveyed (second only to Hidden Reef) (Table 5). Bocaccio, blue, olive, squarespot, widow, and whitespeckled rockfishes, as well as painted greenling were very abundant. Blacksmith and halfmoon were also typical species. As at many other platforms, in 1999 kelp greenling settled out of the plankton at Platform Hermosa. Jack mackerel and northern anchovy were also common. While halfbanded rockfish dominated the bottom assemblage, greenspotted rockfish were also abundant. Halfbanded rockfish also were the most abundant species on the shell mound.

HONDO

Original operator: Exxon; current operator of record: ExxonMobil; date installed: 1976; first production: 1981; distance from shore (miles): 5.1 (OCS); water depth: 255 m (842 ft.); number of well slots: 28; produces: oil and gas; platform jacket dimensions: 68 x 68 m (225 x 225 ft.) (bottom); platform footprint (m²): 4,649; location: 34°23'N, 120°07'W.

Exxon and ExxonMobil did not allow us to survey this platform. However, we were able to review part of an inspection tape made at and near the bottom of Platform Hondo (Divecon International, 3 August 2002). Based on this, a number of rockfishes, including bank, darkblotched, pinkrose, widow and probably blackgill, live around the bottom of Platform Hondo. Darkblotched rockfish appeared to be particularly abundant.

HARMONY

Original operator: Exxon; current operator of record: ExxonMobil; date installed: 1989; first production: 1993; distance from shore (miles): 6.4 (OCS); water depth: 363 m (1,198 ft.); number of well slots: 60; produces: oil and gas; platform jacket dimensions: 91 x 117 m (300 x 385 ft.) (bottom); platform footprint (m²): 10,606; location: 34°22'N, 120°10'W.

Exxon and ExxonMobil did not allow us to survey this platform.

HERITAGE

Original operator: Exxon; current operator of record: ExxonMobil; distance from shore (miles): 8.2 (OCS); water depth: 326 m (1,075 ft.); number of well slots: 60; produces: oil and gas; location: 34°21'N, 120°16'W.

Exxon and ExxonMobil did not allow us to survey this platform. We reviewed part of an ROV inspection of this platform (Divecon International, 2 August 2002) and noted blackgill, darkblotch, pinkrose, and widow rockfish at or near the bottom.

HOLLY

Original operator: Atlantic Richfield, current operator of record: Venoco, date installed: 1966; first production: 1966; distance from shore (miles): 1.8 (state); water depth: 64 m (211 ft.); number of well slots: 30; produces: oil and gas; platform jacket dimensions: 18 x 30 m (60 by 100 ft.) (surface), 36 x 48 m (119 by 158 ft.) (bottom); location: 34°22'N, 119° 52'W.

Dates and types of surveys:

Scuba: 1995–2000

Submersible:

	Midwater	Bottom	Shell
Mound			
1995	x		
1996	x	x	
1997	x	x	x
1998	x	x	x
1999		x	
2000			
2001	x	x	x



The midwaters around Platform Holly were populated by large numbers of blue, copper, kelp, olive, squarespot, and widow rockfishes and bocaccio. With the exception of kelp rockfishes, most of these fishes were juveniles. Blacksmith, halfmoon, kelp bass, painted greenling, pile perch, and sharpnose seaperch were also abundant. Schools of jack mackerel and Pacific sardines were also noted. The platform bottom fish assemblage was characterized by YOY widow rockfish, calico, vermilion, halfbanded, and copper rockfishes, sharpnose seaperch and blackeye goby. Most of the vermilion and copper rockfishes were juveniles and subadults. Calico, vermilion, and copper rockfishes were the most abundant species on the shell mound.

C

Original operator: Union Oil; current operator of record: Nuevo Energy; date installed: 1977; first production: 1977; distance from shore (miles): 5.7 (OCS); water depth: 58 m (192 ft.); number of well slots: 60; produces: oil and gas; platform jacket dimensions: 40 x 48 m (133 x 158 ft.) (bottom); platform footprint (m²): 1,930; location: 34°19'N, 119°37'W.

Dates and types of surveys:

Submersible:

	Midwater	Bottom	Shell Mound
2000	x (partial)		x

Only part of the platform midwater was surveyed and olive rockfish were most abundant. On the shell mound, vermilion, halfbanded, and calico rockfishes were most common, and blackeye goby, copper rockfish and painted greenling were also frequently encountered. A platform inspection video made on 23 September 1999 (Stolt Comex Seaway) around the platform bottom showed large numbers of juvenile blue, brown, copper, olive, vermilion, and widow rockfishes and lingcod. Both juvenile and adult calico, gopher, halfbanded and kelp rockfishes and painted greenling were also present.



B

Original operator: Union Oil; current operator of record: Nuevo Energy; date installed: 1968; first production: 1969; distance from shore (miles): 5.7 (OCS); water depth: 58 m (190 ft.); number of well slots: 63; produces: oil and gas; platform jacket dimensions: 40 x 48 m (133 x 158 ft.) (bottom); platform footprint (m²): 1,930; location: 34°19'N, 119°37'W.

Dates and types of surveys:

Submersible:

	Midwater	Bottom	Shell Mound
2000	x		



Juvenile widow rockfish, which had probably settled from the plankton in 1999, were abundant in the platform midwaters in 2000. Blacksmith, young blue, olive and kelp rockfishes, senorita and painted greenling were also common. We reviewed a video of a platform inspection (Stolt Comex Seaway, 21 September 1999) and noted large numbers of juvenile lingcod, blue, flag, and vermilion rockfishes as well as many juvenile and adult calico, gopher, halfbanded, kelp and rosy rockfishes and painted greenling.

A

Original operator: Union Oil; current operator of record: Nuevo Energy; date installed: 1968; first production: 1969; distance from shore (miles): 5.8 (OCS); water depth: 57 m (188 ft.); number of well slots: 57; produces: oil and gas; platform jacket dimensions: 40 x 48 m (133 x 158 ft.) (bottom); platform footprint (m²): 1,930; location: 34°19'N, 119°36'W.

Dates and types of surveys:

Submersible:

	Midwater	Bottom	Shell Mound
2000	x		



Blacksmith, blue and olive rockfishes were most abundant in the platform midwaters during 2000. Halfmoon, kelp bass and painted greenling were also common. Due to poor visibility, we were unable to survey the bottom and shell mound of Platform A during 2000. However, we reviewed a 2001 platform inspection video tape (Divecon International 2001) conducted with a remotely operated vehicle. That tape showed that there were large numbers of fishes, primarily rockfishes, around the platform bottom. These included many subadult vermilion and copper rockfishes, as well as blue, calico, gopher, kelp, and juvenile widow rockfishes, lingcod and painted greenling.

HILLHOUSE

Original operator: Sun Oil; current operator of record: Nuevo Energy; date installed: 1969; first production: 1970; distance from shore (miles): 5.5 (OCS); water depth: 58 m (190 ft.); number of well slots: 60; produces: oil and gas; platform jacket dimensions: 49 x 40 m (163 x 133 ft.) (bottom); location: 34°19'N, 119°36'W.

Dates and types of surveys:

Submersible:

	Midwater	Bottom	Shell Mound
2000	x		



Blacksmith and painted greenling were the most abundant species in the platform midwaters. Poor water visibility prevented us from surveying the platform bottom and shell mound. We reviewed a videotape made during an ROV platform inspection survey (Divecon International, 26 August 2001) and, although this too was conducted during poor visibility, noted juvenile copper, flag, and vermilion rockfishes, as well as painted greenling and pile perch.

HENRY

Current operator of record: Nuevo Energy; date installed: 1979; first production: 1980; distance from shore (miles): 4.3 (OCS); water depth: 52 m (173 ft.); number of well slots: 24; produces: oil and gas; platform jacket dimensions: 45 x 33 m (149 x 110 ft.) (bottom); size of shell mound: 9 m (19 ft) high, circular and 76 m (250 ft.) in diameter; platform footprint (m²): 1,505; location: 34°19'N, 119°33'W.

Dates and types of surveys:

Submersible:	Midwater	Bottom	Shell Mound
2000	x		



Halfmoon, blacksmith and kelp bass were common in the midwaters of Platform Henry.

HOUCHIN

Original operator: Phillips Petroleum/Continental Oil/Cities Services Oil; current operator of record: Pacific Operators Offshore; date installed: 1968; first production: 1969; distance from shore (miles): 4.1 (OCS); water depth: 49 m (163 ft.); number of well slots: 60; produces: oil and gas; platform jacket dimensions: 38 x 38 m (125 x 125 ft.) (bottom); size of shell mound: 6 m (21 ft.) high, circular and 85 m (280 ft.) in diameter; 1,435; location: 34°20'N, 119°33'W.

Dates and types of surveys:

Submersible:	Midwater	Bottom	Shell Mound
2000	x		



Painted greenling and halfmoon were the most abundant species in the platform midwaters.

HOGAN

Original operator: Phillips Petroleum/Continental Oil/Cities Services Oil; current operator of record: Pacific Operators Offshore; date installed: 1967; first production: 1968; distance from shore (miles): 3.7 (OCS); water depth: 47 m (154 ft.); number of well slots: 66; produces: oil and gas; platform jacket dimensions: 38 x 38 m (125 x 125 ft.) (bottom); platform footprint (m²): 1,435; location: 34°20'N, 119°32'W.

Dates and types of surveys:

Submersible:	Midwater	Bottom	Shell Mound
2000	x		

The midwaters around Platform Hogan were important habitat for a diverse fish assemblage. Blacksmith, blue and olive rockfishes, painted greenling, sharpnose seaperch, pile perch and California sheephead were all common species.



HABITAT

Original operator: Texaco; current operator of record: Nuevo Energy; date installed: 1981; first production: 1993; distance from shore (miles): 7.8 (OCS); water depth: 88 m (290 ft.); number of well slots: 24; produces: gas; platform jacket dimensions: 60 x 38 m (199 x 125 ft.) (bottom); platform footprint (m²): 2,284; location: 34°17'N, 119°35'W.

Dates and types of surveys:

Submersible:	Midwater	Bottom	Shell Mound
1995	x (partial)		
2000	x		



YOY widow rockfish, blacksmith, and one-year-old widow rockfish dominated the midwater at Platform Habitat. Blue and kelp rockfishes and painted greenling were also common species.

GRACE

Original operator: Standard Oil; current operator of record: Venoco; date installed: 1979; first production: 1980; distance from shore (miles): 10.5 (OCS); water depth: 96 m (318 ft.); number of well slots: 48; produces: Grace is a non-producing platform; platform jacket dimensions (at surface and at bottom): 27 x 44 m (90 by 145 ft.) (surface), 48 x 65 m (158 x 213 ft.) (bottom); size of shell mound: 4 m (13 ft.) high, oval, 61 x 118 m (200 x 390 ft.), oriented in a northwest-southeast direction; platform footprint (m²): 3,090; location: 34°10'N, 119°28'W.

Dates and types of surveys:

Submersible:	Midwater	Bottom	Shell Mound
1996	x	x	
1997	x	x	x
1998	x		x
1999	x	x	x
2000	x	x	x
2001	x	x	x

The midwaters around Platform Grace contained very large numbers of young rockfishes. Most of these rockfishes recruited between 1999 and 2001. YOY widow rockfish and bocaccio, juvenile squarespot, blue and widow rockfishes, bocaccio and juvenile and adult blacksmith were very common. Painted greenling, sharpnose seaperch, jack mackerel and young flag rockfish were also frequently encountered. Halfbanded rockfish were the most abundant species around the platform bottom. Juvenile widow, vermilion, and flag rockfishes and bocaccio were also abundant. Many of these individuals had settled out of the plankton at the platform in 1999 and had remained there. Squarespot and greenspotted rockfishes, young lingcod, and sanddabs were also common. Over the shell mounds, halfbanded rockfish and shiner perch were the most abundant species. Pink seaperch, sanddabs, YOY bocaccio, young lingcod, juvenile greenspotted, flag and vermilion rockfishes were also characteristic species.



GILDA

Original operator: Union Oil; Current operator of record: Nuevo Energy; date installed: 1981; first production: 1981; distance from shore (miles): 8.8 (OCS); water depth: 62 m (205 ft.); number of well slots: 96; produces: oil and gas; platform jacket dimensions: 45 x 52 m (150 x 170 ft.) (bottom); platform footprint (m²): 2,342. location: 34°10'N, 119°25'W.

Dates and types of surveys:

Scuba: 1995–2000

Submersible:

	Midwater	Bottom	Shell Mound
2000	x		



Blacksmith, halfmoon, kelp bass, opaleye, seniorita, as well as YOY and juvenile blue, olive, squarespot and widow rockfishes and bocaccio were abundant in the midwater of this platform. Many of these rockfishes recruited from the plankton as YOYs during 1999. Due to poor visibility, we were unable to survey the bottom and shell mound of Platform Gilda during 2000. However, we reviewed a 2001 platform inspection video tape (Divecon International 2001) conducted with a remotely operated vehicle. That tape showed high densities of calico and juvenile vermilion rockfishes, as well as blue, brown, copper, halfbanded, olive, and widow rockfishes. Kelp greenling, lingcod, Pacific sanddab, and painted greenling were also noted.

GAIL

Original operator: Standard Oil; current operator of record: Venoco; date installed: 1987; first production: 1988; distance from shore (miles): 9.9 (OCS); water depth: 224 m (739 ft.); number of well slots: 36; produces: oil and gas; platform jacket dimensions: 21 x 52 m (70 x 170 ft.) (surface), 60 x 90 m (197 x 297 ft.) (bottom); platform footprint (m²): 5,327; location: 34°07'N, 119°24'W.

Dates and types of surveys:

Scuba: 1996–2000

Submersible:

	Midwater	Bottom	Shell Mound
1996	x	x	
1997	x	x	x
1998	x		
1999	x	x	x
2000	x	x	x
2001	x	x	x



Blacksmith, halfmoon, kelp bass and a variety of young rockfishes, including bocaccio, blue, flag, olive, and widow, characterized the midwaters of this platform. Most of the young rockfishes settled from the plankton in 1999. The platform bottom fish assemblage was dominated by adult bocaccio, greenblotched, greenspotted, stripetail and pinkrose rockfishes. Of particular interest, we observed higher densities of both adult cowcod and bocaccio at the bottom of Platform Gail than at any natural outcrop or other platform. The shell mound at Platform Gail was characterized by stripetail, pinkrose, greenblotched and greenstriped rockfishes. On one occasion, large numbers of juvenile hake were observed, on another northern anchovies were abundant.

GINA

Original operator: Union Oil; current operator of record: Nuevo Energy; date installed: 1980; first production: 1982; distance from shore (miles): 3.7 (OCS); water depth: 29 m (95 ft.); number of well slots: 15; produces: oil and gas; platform jacket dimensions: 28 x 20 m (94 x 65 ft.) (bottom); shell mound: 4 m (13 ft.) high, oval, 45 x 64 m (150 x 210 ft.), oriented in a northwest-southeast direction; platform footprint (m²): 561; location: 34°07'N, 119°16'W.

Dates and types of surveys:

Scuba: 1995–2000

Platform Gina had the highest species richness (47) of any platform surveyed using scuba. Blacksmith dominated the assemblage, comprising 38% of all fishes observed. A close second was kelp bass, which counted for 31% of all fishes observed. Platform Gina had the highest number and density of surfperches of any platform, and was the only site where rubberlip surfperch formed part of the assemblage. The shell mound habitat at this platform provided excellent habitat for many species of recruiting rockfishes, where 13 species were observed. However, despite being present at every other surveyed platform, no widow or bocaccio juveniles were observed at Platform Gina. Pelagic species that characterized this assemblage include yellowtail, barracuda, and jackmackerel.

EDITH

Original operator: Standard Oil; current operator of record: Nuevo Energy; date installed: 1983; first production: 1984; distance from shore (miles): 8.5 (OCS); water depth: 49 m (161 ft.); number of well slots: 72; produces: oil and gas; platform jacket dimensions: 58 x 50 m (190 x 165 ft.) (bottom); platform footprint (m²): 2,879; location: 33°35'N, 118°08'W.

Dates and types of surveys:

Submersible:

	Midwater	Bottom	Shell Mound
1998	x	x	x



Blacksmith, halfmoon, opaleye, sheephead and garibaldi characterized the midwater fish assemblage at Platform Edith. Very high densities of California scorpionfish, along with sharpnose seaperch, blacksmith and blackeye goby were found at the platform bottom. California scorpionfish were also extremely abundant on the shell mound.

ELLEN

Original operator: Shell Oil; current operator of record: Aera Energy; date installed: 1980; first production: 1981; distance from shore (miles): 8.6 (OCS); water depth: 80 m (265 ft.); number of well slots: 80; produces: oil and gas; platform jacket dimensions: 45 x 56 m (147 x 186 ft.) (bottom); platform footprint (m²): 2,511; location: 33°34'N, 118°07'W.



Aera did not allow us to survey this platform. We reviewed a tape of a platform inspection carried out with a remotely operated vehicle (Divecon International, 7 September 2001) and observed very high densities of flag, halfbanded, squarespot and honeycomb rockfishes. We also saw a number of young vermilion rockfish. In the platform midwater, from about 61 m (200 ft) and deeper, there were very large numbers of young rockfishes, including both squarespots and widows.

ELLY

Original operator: Shell Oil; current operator of record: Aera Energy; date installed: 1980; first production: n/a; distance from shore (miles): 8.6 (OCS); water depth: 77 m (255 ft.); number of well slots: n/a; produces: Elly is a processing facility for Ellen and Eureka; platform jacket dimensions: 48 x 61 m (159 x 202 ft.) (bottom); platform footprint (m²): 2,949; location: 33°35'N, 118°07'W.



Aera did not allow us to survey this platform. We reviewed a tape of a platform inspection carried out with a remotely operated vehicle (Divecon International, 9 September 2001) and observed high densities of young vermilion and young widow rockfishes, as well as many flag, honeycomb, olive, and squarespot rockfishes, and lingcod.



EUREKA

Original operator: Shell Oil; current operator of record: Aera Energy; date installed: 1984; first production: 1985; distance from shore (miles): 9.0 (OCS); water depth: 212 m (700 ft.); number of well slots: 60; produces: oil and gas; platform jacket dimensions: 54 x 85 m (179 x 282 ft.) (bottom); platform footprint (m²): 4,635; location: 33°33'N, 118°06'W.

Aera did not allow us to survey this platform. We reviewed a tape of a platform inspection carried out with a remotely operated vehicle (Divecon International, 5 September 2001) and observed large numbers of pink-rose and juvenile darkblotched rockfishes, as well as juvenile and subadult bocaccio and widow rockfish. Also present were flag, greenblotched and greenspotted, and perhaps speckled, rockfishes and lingcod.

EVA

Original operator: Union Oil Company; current operator of record: Nuevo Energy; date installed: 1964; first production: 1966; distance from shore (miles): 1.8 (state); water depth: 17 m (57 ft.); number of well slots: 39; produces: oil and gas; location: 33°39'N, 118°03'W.



EMMY

Original operator: Signal Oil and Gas Company; current operator of record: Aera Energy; date installed: 1963; first production: 1963; distance from shore (miles): 1.2 (state); water depth: 14 m (47 ft.); number of well slots: 53; produces: oil and gas; location: 33°39'N, 118°02'W.

Aera did not allow us to survey this platform.



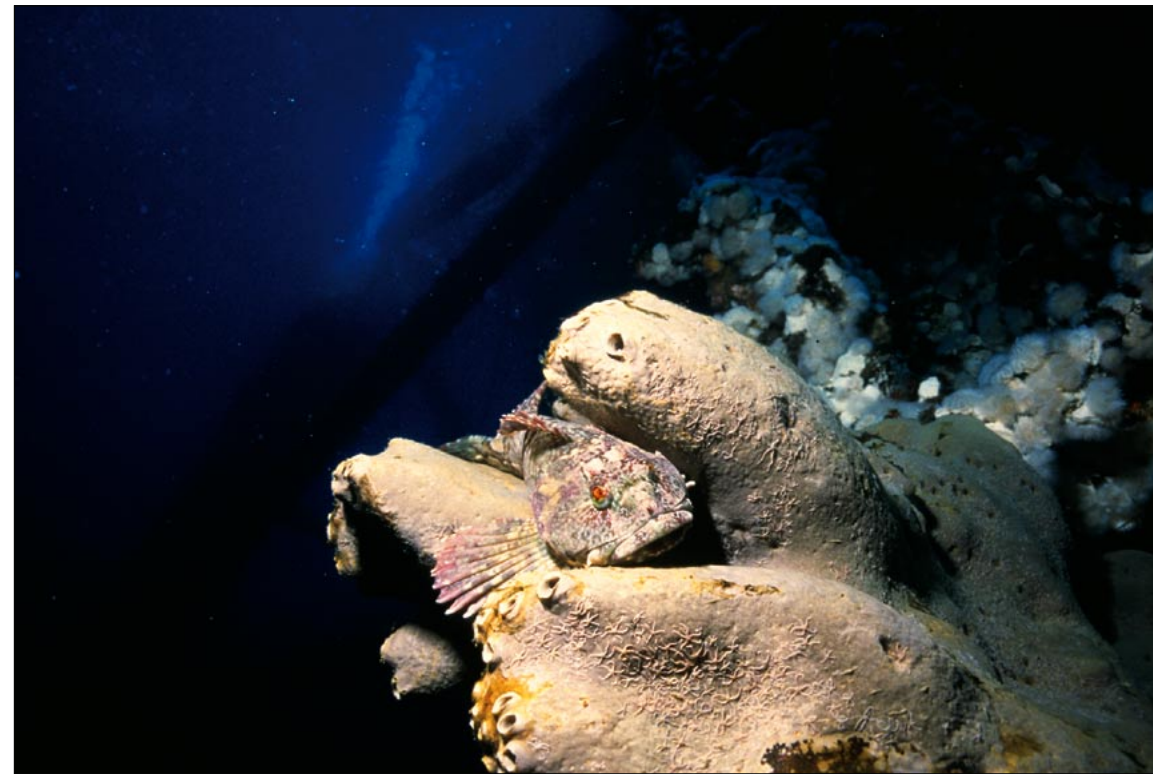
APPENDIX 2

Density of fishes observed during the oil/gas platform scuba surveys off central and southern California. Platforms are listed from northwest to southeast. Density is in fish per 100 m², “<” means “less than.”

Common name	Irene	Hidalgo	Harvest	Hermosa	Holly	Grace	Gilda	Gail	Gina
Barred sand bass					0.8				
Black rockfish		<0.1		<0.1		<0.1			<0.1
Black-and-yellow rockfish			<0.1	<0.1		<0.1			
Blackeye goby		<0.1	<0.1			<0.1		0.2	4.0
Blacksmith	1.6	16.2	20.0	8.5	20.9	71.3	57.4	77.4	51.3
Blue rockfish	32.3	3.8	18.9	7.5	36.3	5.3	9.8	3.9	1.3
Bluebanded goby									<0.1
Bocaccio	9.5	0.1	3.7	0.8	36.6	2.7	5.0	5.9	
Brown rockfish		<0.1			<0.1		<0.1		<0.1
Bull sculpin							<0.1		
Cabazon	0.1	0.1	0.2	0.2	0.1	<0.1	0.1	<0.1	1.1
Calico rockfish							<0.1		0.6
California barracuda						0.4	<0.1		0.8
California scorpionfish	<0.1				<0.1				0.1
California sheephead			<0.1			<0.1	0.1	<0.1	0.3
C-O turbot									<0.1
Copper rockfish	0.2	0.2	0.1	0.1	0.8	0.1	<0.1	<0.1	<0.1
Copper	6.1	4.7	3.1	1.5	0.7	0.8	0.4	0.1	0.2
-complex juv. rockfishes									
Garibaldi						<0.1	0.1	<0.1	0.1
Giant kelpfish					<0.1				
Gopher rockfish	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Grass rockfish					<0.1	<0.1	<0.1	0.2	<0.1
Halfbanded rockfish									0.6
Halfmoon	<0.1	1.3	0.3	0.9	3.1	2.2	16.7	13.7	2.4
Jackmackerel	69.3	22.1		8.0	34.5	6.1	6.3	0.2	9.6
Kelp bass					<0.1	0.5	6.1	1.8	42.9
Kelp greenling	0.1	0.4	0.6	0.4	0.1	0.1	0.1	0.1	<0.1
Kelp rockfish	<0.1	0.7	0.2	0.1	3.7	1.5	0.6	0.4	0.4
Lingcod	<0.1				0.1		<0.1		0.2
Mussel blenny							<0.1		
Northern anchovy		6.3	7.4	7.4					
Ocean sunfish	<0.1								
Ocean whitefish				0.0					0.8
Olive rockfish	0.6	0.7	4.5	3.8	2.5	0.3	1.6	0.9	0.2
Opaleye						<0.1	2.4	0.1	2.5
Pacific butterfish	<0.1								
Pacific mackerel						<0.1			
Painted greenling	3.4	1.6	1.5	2.9	1.9	1.0	0.5		1.7
Pile perch	0.1				0.7		0.2		3.4
Rock wrasse							0.1		0.1
Rosy rockfish	<0.1	0.5	<0.1		<0.1			<0.1	0.1
Rubberlip seaperch									0.6
Sarcastic fringehead						<0.1			
Sardine	7.1		0.2		169.3	36.4	1.2	6.8	
Senorita							3.6	0.2	
Sharprnose seaperch					1.9		0.7		2.3

APPENDIX 2

Common name	Irene	Hidalgo	Harvest	Hermosa	Holly	Grace	Gilda	Gail	Gina
Shortbelly rockfish	57.0								
Spotted sand bass									<0.1
Squarespot rockfish	4.7	8.4	3.3		49.0	5.4	13.3	0.2	4.2
Starry rockfish									<0.1
Stripetail rockfish									1.2
Treefish	0.4	0.1	0.2	<0.1	0.1	0.2	0.1	0.1	0.1
Unidentified Atherinidae					12.3				
Unidentified Blenniidae					<0.1	<0.1		<0.1	
Unidentified Bothidae									<0.1
Unidentified Clinidae					<0.1				
Unidentified Cottidae	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1
Unidentified fish species	<0.1	<0.1	<0.1		<0.1		<0.1	<0.1	<0.1
Unidentified rockfish juveniles	4.9	8.6	1.2	0.1	1.6	0.5	0.2	0.1	0.6
Vermilion rockfish									0.1
White seaperch	<0.1				<0.1		<0.1		1.5
Widow rockfish	141.4	10.8	46.9	15.5	54.9	2.7	1.5	<0.1	
Wolf eel	<0.1								<0.1
Yellowtail									0.1



Cabezon in the midwater of Platform Holly.

DAN DUGAN

APPENDIX 3

Number and density of fishes observed in the midwaters, bottoms and shell mounds of oil/gas platforms off central and southern California. Platforms are listed geographically, from northwest to southeast. Species are ranked by number observed. YOY means “young-of-the-year”, those are fish that are less than one year old. Density is in fish per 100 m², “<” means “less than”.

PLATFORM MIDWATERS

Because we could not estimate the lengths of the transects around Platforms Habitat and Gilda, no fish densities are presented.

PLATFORM IRENE (Surveyed 1995–2001)

Species	Number	Density
Shortbelly rockfish YOY	7,300	378
Unidentified rockfish YOY	4,133	214
Widow rockfish YOY	2,310	120
Pacific sardine	1,600	83
Bocaccio YOY	989	51
Widow rockfish	372	19
Yellowtail rockfish	133	7
Blacksmith	120	6
Painted greenling	26	1
Copper rockfish	24	1
Pile surfperch	11	<1
Blue rockfish	5	<1
Unidentified rockfish	2	<1
Kelp greenling	1	<1
Lingcod	1	<1
Olive rockfish	1	<1

TOTAL	17,028	880
Minimum number of species	14	
Total rockfish YOY	14,732	763
Total rockfishes	15,269	790

Rockfish YOY comprised 86.5% of all fishes surveyed.
All rockfishes comprised 89.7% of all fishes surveyed.

PLATFORM HIDALGO (Surveyed 1996–2001)

Species	Number	Density
Unidentified rockfish YOY	13,134	186
Widow rockfish YOY	794	11
Painted greenling	136	2
Bocaccio YOY	87	1
Halfbanded rockfish	34	<1
Widow rockfish	26	<1
Flag rockfish	6	<1
Kelp greenling	5	<1
Yellowtail rockfish	5	<1
Squarespot rockfish	5	<1
Pygmy rockfish	3	<1
Unidentified fish	3	<1
Greenspotted rockfish	2	<1
Unidentified sculpin	1	<1
Copper rockfish	1	<1
Cabezon	1	<1

TOTAL	14,243	200
Minimum number of species	13	
Total rockfish YOY	14,015	198
Total rockfishes	14,097	198

Rockfish YOY comprised 98.3% of all fishes surveyed.
All rockfishes comprised 98.9% of all fishes surveyed.

PLATFORM MIDWATERS, cont.

PLATFORM HARVEST (Surveyed 1996–2000)			PLATFORM HERMOSA (Surveyed 1996–2000)		
Species	Number	Density	Species	Number	Density
Unidentified rockfish YOY	5,000	54	Unidentified rockfish YOY	17,242	199
Widow rockfish YOY	1,474	16	Widow rockfish YOY	1,140	16
Squarespot rockfish	1,246	14	Painted greenling	480	7
Painted greenling	289	3	Blue rockfish	436	5
Sharpchin rockfish	171	2	Widow rockfish	256	3
Whitespeckled rockfish	134	1	Squarespot rockfish	148	2
Widow rockfish	113	1	Whitespeckled rockfish	47	<1
Chilipepper	50	<1	<i>Sebastomus</i> sp.	42	<1
<i>Sebastomus</i> sp.	47	<1	Blacksmith	30	<1
Bocaccio YOY	43	<1	Bocaccio YOY	29	<1
Flag rockfish	26	<1	Unidentified rockfish	22	<1
Unidentified rockfish	23	<1	Pacific hake	19	<1
Unidentified fish	22	<1	Greenspotted rockfish	12	<1
Greenspotted rockfish	21	<1	Halfbanded rockfish	10	<1
Blue rockfish	18	<1	Flag rockfish	8	<1
Blacksmith	13	<1	Copper rockfish	5	<1
Kelp rockfish	5	<1	Cowcod	5	<1
Cabazon	2	<1	Unidentified fish	4	<1
Kelp greenling	2	<1	Unidentified sculpin	3	<1
Pacific sardine	2	<1	Cabazon	3	<1
Rosy rockfish	2	<1	Lingcod	3	<1
Shortbelly rockfish	2	<1	Sharpchin rockfish	3	<1
Blackeye goby	1	<1	Chilipepper	2	<1
Bocaccio	1	<1	Stripetail rockfish	2	<1
Calico rockfish	1	<1	Treefish	2	<1
Halfbanded rockfish	1	<1	Yelloweye rockfish	2	<1
Pygmy rockfish	1	<1	TOTAL	19,955	232
Shortspine combfish	1	<1	Minimum number of species	21	
Starry rockfish	1	<1	Total rockfish YOY	18,411	215
Treefish	1	<1	Total rockfishes	19,413	225
Wolf-eel	1	<1	Rockfish YOY comprised 92.2% of all fishes surveyed.		
Yellowtail rockfish	1	<1	All rockfishes comprised 97.3% of all fishes surveyed.		
TOTAL	8,715	91			
Minimum number of species	26				
Total rockfish YOY	6,517	70			
Total rockfishes	8,382	88			
Rockfish YOY comprised 74.8% of all fishes surveyed.					
All rockfishes comprised 96.2% of all fishes surveyed.					

PLATFORM MIDWATERS, cont.

PLATFORM HOLLY (Surveyed 1995–1998, 2001)			PLATFORM A (Surveyed 2000)		
Species	Number	Density	Species	Number	Density
Pacific sardine	1,506	78	Blacksmith	421	28
Squarespot rockfish	315	16	Blue rockfish	336	22
Jack mackerel	287	15	Olive rockfish	126	8
Unidentified rockfish YOY	129	6	Halfmoon	25	2
Painted greenling	120	6	Kelp bass	17	1
Kelp rockfish	43	2	Painted greenling	11	<1
Copper rockfish	31	2	Unidentified seaperch	9	<1
Sharpnose seaperch	31	1	Sharpnose seaperch	9	<1
Yellowtail rockfish	22	1	Kelp rockfish	8	<1
Blacksmith	8	<1	Garibaldi	7	<1
Pile perch	7	<1	Unidentified rockfish YOY	6	<1
Brown rockfish	7	<1	Pile perch	5	<1
Calico rockfish	6	<1	California sheephead	4	<1
Gopher rockfish	6	<1	Blackeye goby	3	<1
Unidentified rockfish	6	<1	Unidentified fish	1	<1
<i>Sebastomus</i> sp.	4	<1	Unidentified rockfish	1	<1
Treefish	3	<1	TOTAL	989	61
Unidentified sculpin	2	<1	Minimum number of species	13	
Widow rockfish	2	<1	Total rockfish YOY	6	<1
Blue rockfish	2	<1	Total rockfishes.	477	30
Bocaccio YOY	2	<1	Rockfish YOY comprised <1% of all fishes surveyed.		
Unidentified fish	2	<1	All rockfishes comprised 48.2% of all fishes surveyed.		
Lingcod	1	<1			
Olive rockfish	1	<1			
Rubberlip seaperch	1	<1			
Widow rockfish YOY	1	<1			
Unidentified seaperch	1	<1			
TOTAL	2,546	127			
Minimum number of species	22				
Total rockfish YOY	122	6			
Total rockfishes	580	27			
Including the one time occurrence of Pacific sardine, YOY rockfishes comprised 4.8%, and all rockfishes comprised 22.8% of all fishes surveyed.					
Excluding Pacific sardines, YOY rockfishes comprised 11.7%, and all rockfishes comprised 55.8% of all fishes surveyed.					

PLATFORM MIDWATERS, cont.

PLATFORM B (Surveyed 2000)

Species	Number	Density
Widow rockfish	180	12
Blacksmith	124	8
Blue rockfish	44	3
Olive rockfish	26	2
Kelp rockfish	16	1
Senorita	13	<1
Painted greenling	13	<1
California sheephead	9	<1
Kelp bass	6	<1
Sharpnose seaperch	6	<1
Halfmoon	5	<1
Pile perch	4	<1
Bluebanded goby	2	<1
Cabezon	1	<1
Copper rockfish	1	<1
Gopher rockfish	1	<1
Lingcod	1	<1
Unidentified rockfish YOY	1	<1

TOTAL	453	26
Minimum number of species	17	
Total rockfish YOY	1	<1
Total rockfishes	269	18
Rockfish YOY comprised <1.0% of all fishes surveyed.		
All rockfishes comprised 59.4% of all fishes surveyed.		

PLATFORM HILLHOUSE (Surveyed 2000)

Species	Number	Density
Blacksmith	23	2
Painted greenling	22	2
Kelp bass	7	<1
Olive rockfish	7	<1
Pile perch	3	<1
Kelp rockfish	1	<1
Lingcod	1	<1
<i>Phanerodon</i> sp.	1	<1
Unidentified rockfish	1	<1

TOTAL	66	4
Minimum number of species	8	
Total rockfishes	9	<1

PLATFORM C (Partially Surveyed 2000)

Species	Number	Density
Olive rockfish	13	3
Kelp rockfish	7	2
Pile perch	4	<1
Blue rockfish	4	<1
<i>Phanerodon</i> sp.	3	<1
Vermilion rockfish	2	<1
Unidentified rockfish	2	<1
Lingcod	1	<1
Unidentified fish	1	<1
Unidentified rockfish YOY	1	<1
TOTAL	38	5
Minimum number of species	7	
Total rockfish YOY	1	<1
Total rockfishes	27	5
All rockfishes comprised 71.1% of all fishes surveyed.		

PLATFORM HENRY (Surveyed 2000)

Species	Number	Density
Halfmoon	57	6
Blacksmith	20	2
Kelp bass	12	1
Painted greenling	8	<1
Kelp rockfish	1	<1
Unidentified rockfish YOY	1	<1
TOTAL	99	9
Minimum number of species	5	
Total rockfish YOY	1	<1
Total rockfishes	2	<1
Rockfish YOY comprised 1% of all fishes surveyed.		
All rockfishes comprised 2% of all fishes surveyed.		
All rockfishes comprised 13.6% of all fishes surveyed.		

PLATFORM MIDWATERS, cont.

PLATFORM HOUCHIN (Surveyed 2000)

Species	Number	Density
Painted greenling	41	4
Halfmoon	12	1
Kelp rockfish	9	<1
Blacksmith	4	<1
Unidentified rockfish YOY	4	<1
Garibaldi	3	<1
Pile perch	2	<1
California sheephead	1	<1
Olive rockfish	1	<1
Sharpnose seaperch	1	<1
Unidentified sculpin	1	<1
TOTAL	99	6
Minimum number of species	10	
Total rockfish YOY	4	<1
Total rockfishes	14	<1
Rockfish YOY comprised 4% of all fishes surveyed.		
All rockfishes comprised 14% of all fishes surveyed.		

PLATFORM HABITAT (Partially Surveyed 1995, Surveyed 2000)

Species	Number	Density
Widow rockfish YOY	470	
Blacksmith	122	
Widow rockfish	111	
Unidentified rockfish YOY	41	
Blue rockfish	25	
Painted greenling	14	
Kelp rockfish	14	
Bocaccio YOY	12	
Flag rockfish	7	
Halfmoon	5	
Olive rockfish	5	
Copper rockfish	4	
Garibaldi	4	
Kelp bass	1	
<i>Sebastes</i> sp.	1	
TOTAL	836	
Minimum number of species	13	
Total rockfish YOY	523	
Total rockfishes	690	
Rockfish YOY comprised 62.6% of all fishes surveyed.		
All rockfishes comprised 82.5% of all fishes surveyed.		

PLATFORM MIDWATERS, cont.

PLATFORM GRACE (Surveyed 1996–2001)			PLATFORM GILDA (Surveyed 2000)		
Species	Number	Density	Species	Number	Density
Unidentified rockfish YOY	5,454	79	Widow rockfish	650	
Widow rockfish YOY	2,768	40	Blue rockfish	23	
Squarespot rockfish	1,554	22	Olive rockfish	15	
Blue rockfish	1,029	15	Kelp bass	6	
Widow rockfish	633	9	Kelp rockfish	6	
Bocaccio YOY	396	6	Painted greenling	5	
Blacksmith	313	4	Squarespot rockfish	3	
Bocaccio	142	2	Blacksmith	2	
Painted greenling	86	1	Bocaccio	2	
Sharpnose seaperch	54	<1	Lingcod	1	
Jack mackerel	54	<1	Mola	1	
Flag rockfish	46	<1	Opaleye	1	
Kelp rockfish	35	<1	Pile perch	1	
Olive rockfish	30	<1	Senorita	1	
Pacific mackerel	30	<1	Sharpnose seaperch	1	
Unidentified rockfish	28	<1			
Halfmoon	26	<1	TOTAL	718	
Chilipepper	25	<1	Minimum number of species	15	
<i>Sebastomus</i> sp.	15	<1	Total rockfishes	699	
Brown rockfish	10	<1	All rockfishes comprised 97.4% of all fishes surveyed.		
Copper rockfish	10	<1			
Lingcod	7	<1			
Whitespeckled rockfish	5	<1			
Unknown fish	4	<1			
Unknown sculpin	3	<1			
Greenspotted rockfish	3	<1			
Rosy rockfish	2	<1			
Swordspine rockfish	2	<1			
Treefish	2	<1			
Calico rockfish	1	<1			
Cowcod	1	<1			
Kelp greenling	1	<1			
Pink seaperch	1	<1			
Vermilion rockfish	1	<1			
White seaperch	1	<1			
Unidentified seaperch	1	<1			
TOTAL	12,773	178			
Minimum number of species	29				
Total rockfish YOY	8,618	125			
Total rockfishes	12,192	173			
Rockfish YOY comprised 67.5% of all fishes surveyed.					
All rockfishes comprised 95.5% of all fishes surveyed.					

PLATFORM MIDWATERS, cont.

PLATFORM GAIL (Surveyed 1996–2001)			PLATFORM EDITH (Surveyed 1998)		
Species	Number	Density	Species	Number	Density
Unidentified rockfish YOY	2,371	24	Blacksmith	1,241	265
Blacksmith	241	2	Halfmoon	59	13
Flag rockfish YOY	102	1	Opaleye	37	8
Widow rockfish YOY	93	<1	Sheephead	23	5
Painted greenling	46	<1	Garibaldi	20	4
Bocaccio YOY	28	<1	Sharpnose seaperch	8	1
Unidentified fish	23	<1	Kelp bass	5	1
Pinkrose rockfish	12	<1	Painted greenling	4	1
Widow rockfish	8	<1			
Squarespot rockfish	7	<1	TOTAL	1,397	298
Whitespeckled rockfish	6	<1	Minimum number of species	8	
Bank rockfish	4	<1	No rockfishes observed.		
Unidentified rockfish	4	<1			
Greenblotched rockfish	3	<1			
Blue rockfish	2	<1			
Cabezon	2	<1			
Greenspotted rockfish	2	<1			
Olive rockfish	2	<1			
Bocaccio	1	<1			
Chilipepper	1	<1			
Kelp greenling	1	<1			
Pacific hake	1	<1			
<i>Sebastomus</i> sp.	1	<1			
Swordspine rockfish	1	<1			
TOTAL	2,962	26			
Minimum number of species	19				
Total rockfish YOY	2,593	25			
Total rockfishes	2,648	25			
Rockfish YOY comprised 87.5% of all fishes surveyed.					
All rockfishes comprised 89.4% of all fishes surveyed.					

PLATFORM BOTTOMS

PLATFORM IRENE (Surveyed 1996–2001)			PLATFORM HIDALGO (Surveyed 1996–2001)		
Species	Number	Density	Species	Number	Density
Halfbanded rockfish	5,393	217	Halfbanded rockfish	9,664	305
Unidentified rockfish YOY	1,411	57	Greenspotted rockfish	587	19
Copper rockfish	1,187	47	Unidentified rockfish YOY	307	10
Vermilion rockfish	799	40	Flag rockfish	256	8
Lingcod	468	19	Lingcod	97	3
Calico rockfish	381	15	Greenblotched rockfish	69	2
Widow rockfish YOY	335	13	Widow rockfish	69	2
Pile perch	115	5	Greenstriped rockfish	60	2
Painted greenling	105	4	Bocaccio	56	2
Pacific sanddab	96	4	Painted greenling	47	1
Brown rockfish	78	3	Vermilion rockfish	43	1
Yellowtail rockfish	30	1	Canary rockfish	39	1
Canary rockfish	28	1	Rosy rockfish	36	1
Blue rockfish	25	1	Widow rockfish YOY	34	1
Rosy rockfish	21	<1	Squarespot rockfish	28	<1
Kelp greenling	20	<1	<i>Sebastomus</i> sp.	26	<1
Rubberlip seaperch	19	<1	Sharpchin rockfish	15	<1
Bocaccio YOY	17	<1	Pygmy rockfish	12	<1
<i>Sebastomus</i> sp.	12	<1	Yelloweye rockfish	12	<1
Olive rockfish	8	<1	Swordspine rockfish	10	<1
Unidentified seaperch	5	<1	Cowcod	8	<1
Gopher rockfish	5	<1	Unidentified rockfish	8	<1
Sharpnose seaperch	4	<1	Starry rockfish	6	<1
Squarespot rockfish	4	<1	Unidentified combfish	6	<1
Widow rockfish	4	<1	Kelp greenling	5	<1
Unidentified fish	4	<1	Bocaccio YOY	4	<1
Greenspotted rockfish	3	<1	Shortspine combfish	2	<1
Unidentified rockfish	3	<1	Bank rockfish	1	<1
Bocaccio	2	<1	Stripetail rockfish	1	<1
Flag rockfish	2	<1	Unidentified poacher	1	<1
Kelp rockfish	2	<1			
Honeycomb rockfish	1	<1	TOTAL	11,509	358
Yelloweye rockfish	1	<1	Minimum number of species	24	
Unidentified ronquill	1	<1	Total rockfish YOY	345	11
Unidentified sanddab	1	<1	Total rockfishes	11,351	354
Unidentified flatfish	1	<1	Rockfish YOY comprised 3.0% of all fishes surveyed.		
			All rockfishes comprised 98.6% of all fishes surveyed.		
TOTAL	10,591	427			
Minimum number of species	29				
Total rockfish YOY	1,766	70			
Total rockfishes	9,748	395			
Rockfish YOY comprised 16.7% of all fishes surveyed.					
All rockfishes comprised 92% of all fishes surveyed.					

PLATFORM BOTTOMS, cont.

PLATFORM HARVEST (Surveyed 1997–2000)			PLATFORM HERMOSA (Surveyed 1996–2000)		
Species	Number	Density	Species	Number	Density
Stripetail rockfish	250	10	Halfbanded rockfish	6,718	262
Greenstriped rockfish	207	8	Greenspotted rockfish	321	13
Greenspotted rockfish	78	3	Flag rockfish	42	2
Greenblotched rockfish	67	3	<i>Sebastomus</i> sp.	26	1
Sharpchin rockfish	44	2	Lingcod	24	1
Lingcod	35	1	Unidentified rockfish YOY	9	<1
<i>Sebastomus</i> sp.	24	<1	Pinkrose rockfish	7	<1
Flag rockfish	17	<1	Shortspine combfish	7	<1
Unidentified rockfish	12	<1	Cowcod	6	<1
Unidentified combfish	10	<1	Greenstriped rockfish	6	<1
Unidentified rockfish YOY	6	<1	Greenblotched rockfish	5	<1
Chilipepper	5	<1	Shortbelly rockfish	4	<1
Halfbanded rockfish	4	<1	Unidentified rockfish YOY	4	<1
Shortspine combfish	4	<1	Pacific hake	2	<1
Unidentified flatfish	3	<1	Ratfish	2	<1
Cowcod	2	<1	Swordspine rockfish	2	<1
Pinkrose rockfish	2	<1	Unidentified rockfish	2	<1
Unidentified poacher	2	<1	Bocaccio YOY	1	<1
Bank rockfish	1	<1	Canary rockfish	1	<1
Bocaccio	1	<1	Darkblotched rockfish	1	<1
Swordspine rockfish	1	<1	Pink seaperch	1	<1
			Sharpchin rockfish	1	<1
TOTAL	775	27	Starry rockfish	1	<1
Minimum number of species	17		Whitespeckled rockfish	1	<1
Total rockfish YOY	6	<1	Widow rockfish	1	<1
Total rockfishes	721	26	Unidentified combfish	1	<1
Rockfish YOY comprised <1% of all fishes surveyed.			Unidentified fish	1	<1
All rockfishes comprised 93.0% of all fishes surveyed.			Unidentified flatfish	1	<1
			Unidentified poacher	1	<1
			TOTAL	7,195	279
			Minimum number of species	23	
			Total rockfish YOY	14	<1
			Total rockfishes	7,159	278
			Rockfish YOY comprised <1% of all fishes surveyed.		
			All rockfishes comprised 99.5% of all fishes surveyed.		

PLATFORM BOTTOMS, cont.

PLATFORM HOLLY (Surveyed 1996–1999, 2001)

Species	Number	Density
Widow rockfish YOY	1,028	49
Calico rockfish	726	35
Vermilion rockfish	444	21
Sharpnose seaperch	407	19
Halfbanded rockfish	405	19
Copper rockfish	285	13
Squarespot rockfish	221	10
Blackeye goby	67	3
Unidentified seaperch	66	3
Unidentified rockfish YOY	54	3
Pink seaperch	53	3
Painted greenling	51	2
Rosy rockfish	43	2
Brown rockfish	38	2
Pile perch	37	2
Lingcod	36	2
Widow rockfish	29	1
Flag rockfish	24	1
<i>Sebastomus</i> sp.	24	1
Unidentified flatfish	20	<1
Honeycomb rockfish	19	<1
Canary rockfish	18	<1
Unidentified rockfish	13	<1
Blue rockfish	12	<1
Unidentified ronquill	10	<1
Rubberlip seaperch	9	<1
Treefish	9	<1
Kelp rockfish	8	<1
Olive rockfish	8	<1
Gopher rockfish	7	<1
Kelp greenling	5	<1
Unidentified fish	4	<1
California scorpionfish	3	<1
Bocaccio YOY	2	<1
<i>Rathbunella</i> sp.	2	<1
Yellowtail rockfish	2	<1
Unidentified combfish	2	<1
Cowcod	1	<1
Greenspotted rockfish	1	<1
Shortspine combfish	1	<1
Shortspine thornyhead	1	<1
TOTAL	4,195	191
Minimum number of species	33	
Total rockfish YOY	1,084	52
Total rockfishes	3,421	157

PLATFORM GRACE (Surveyed 1996, 1997, 1999–2001)

Species	Number	Density
Halfbanded rockfish	11,078	408
Widow rockfish	413	15
Squarespot rockfish	220	8
Vermilion rockfish	205	8
Bocaccio YOY	203	7
Bocaccio	183	7
Shiner perch	130	5
Flag rockfish	103	4
Unidentified sanddab	79	3
Greenspotted rockfish	66	2
Lingcod	41	2
Painted greenling	29	1
Unidentified rockfish YOY	28	1
Chilipepper	26	<1
<i>Sebastomus</i> sp.	24	<1
Rosy rockfish	21	<1
Pink seaperch	19	<1
Unidentified flatfish	12	<1
Blue rockfish	9	<1
Kelp greenling	9	<1
Copper rockfish	8	<1
Unidentified rockfish	8	<1
Canary rockfish	7	<1
Unidentified fish	6	<1
Treefish	5	<1
Greenblotched rockfish	4	<1
Unidentified combfish	4	<1
Whitespeckled rockfish	3	<1
Widow rockfish	3	<1
Shortspine combfish	3	<1
Yellowtail rockfish	2	<1
Pink rockfish	1	<1
<i>Rathbunella</i> sp.	1	<1
Yelloweye rockfish	1	<1
Unidentified sculpin	1	<1
TOTAL	12,955	471
Minimum number of species	28	
Total rockfish YOY	231	8
Total rockfishes	12,621	460
Rockfish YOY comprised 1.8% of all fishes surveyed.		
All rockfishes comprised 97.4% of all fishes surveyed.		
Rockfish YOY comprised 25.8% of all fishes surveyed.		
All rockfishes comprised 81.5% of all fishes surveyed.		

PLATFORM BOTTOMS, cont.

PLATFORM GAIL (Surveyed 1996, 1997, 1999–2001)

Species	Number	Density
Greenblotched rockfish	369	12
Bocaccio	328	11
Greenspotted rockfish	278	9
Stripetail rockfish	200	7
Pinkrose rockfish	168	6
<i>Sebastomus</i> sp.	63	2
Greenstriped rockfish	61	2
Cowcod	34	1
Mexican rockfish	22	<1
Lingcod	17	<1
Unidentified rockfish	14	<1
Flag rockfish	11	<1
Chilipepper	7	<1
Unidentified rockfish YOY	5	<1
Unidentified poachers	4	<1
Swordspine rockfish	3	<1
Dover sole	2	<1
Unidentified fish	2	<1
Unidentified flatfish	2	<1
Bank rockfish	1	<1
Bocaccio YOY	1	<1
Darkblotched rockfish	1	<1
surveyed.		
Northern anchovy	1	<1
Painted greenling	1	<1
Pink rockfish	1	<1
Redbanded rockfish	1	<1
Sharpchin rockfish	1	<1
Widow rockfish	1	<1
Unidentified combfish	1	<1
TOTAL	1,600	50
Minimum number of species	23	
Total rockfish YOY	5	<1
Total rockfishes	1,570	50
Rockfish YOY comprised <1% of all fishes surveyed.		
All rockfishes comprised 98.2% of all fishes surveyed.		

PLATFORM EDITH (Surveyed 1998)

Species	Number	Density
California scorpionfish	274	63
Sharpnose seaperch	71	16
Blacksmith	35	8
Blackeye goby	22	5
Treefish	9	2
Unidentified seaperch	8	2
Painted greenling	6	1
Unidentified rockfish YOY	5	1
Pile perch	3	<1
Cabezon	3	<1
Unidentified fish	3	<1
Honeycomb rockfish	2	<1
Squarespot rockfish	1	<1
<i>Sebastomus</i> sp.	1	<1
California sheephead	1	<1
Unidentified rockfish	1	<1
TOTAL	445	98
Minimum number of species	12	
Total rockfish YOY	5	<1
Total rockfishes	19	
Rockfish YOY comprised 1.1% of all fishes		

All rockfishes comprised 1% of all fishes surveyed.

PLATFORM SHELL MOUNDS

PLATFORM IRENE (SURVEYED 1996–2001)			PLATFORM HIDALGO (SURVEYED 1996–2001)		
Species	Number	Density	Species	Number	Density
Halfbanded rockfish	965	45	Halfbanded rockfish	3,496	124
Lingcod	404	19	Lingcod	127	4
Copper rockfish	215	10	Painted greenling	35	1
Pacific sanddab	92	4	Greenspotted rockfish	28	<1
Vermilion rockfish	76	4	Greenstriped rockfish	24	<1
Painted greenling	72	3	Unidentified rockfish YOY	21	<1
Calico rockfish	32	2	Rosy rockfish	20	<1
Pile perch	18	<1	Pacific sanddab	17	<1
Rosy rockfish	9	<1	Swordspine rockfish	17	<1
Kelp greenling	8	<1	Unidentified combfish	8	<1
Unidentified rockfish YOY	8	<1	Unidentified sanddab	7	<1
Olive rockfish	5	<1	Cowcod	4	<1
Unidentified fish	5	<1	Flag rockfish	4	<1
Canary rockfish	3	<1	Pink seaperch	4	<1
Unidentified flatfish	3	<1	Shortspine combfish	4	<1
Unidentified sanddab	3	<1	Unidentified poacher	4	<1
Bocaccio YOY	2	<1	Canary rockfish	2	<1
Brown rockfish	2	<1	Unidentified fish	2	<1
<i>Sebastomus</i> sp.	2	<1	Bank rockfish	1	<1
Widow rockfish	2	<1	Longspine combfish	1	<1
Wolf-eel	2	<1	Pygmy rockfish	1	<1
Yellowtail rockfish	2	<1	Ratfish	1	<1
Unidentified ronquill	2	<1	<i>Rathbunella</i> sp.	1	<1
Flag rockfish	1	<1	<i>Sebastomus</i> sp.	1	<1
Pink seaperch	1	<1	Sharpchin rockfish	1	<1
Unidentified rockfish	1	<1	Starry rockfish	1	<1
Unidentified sculpin	1	<1	Vermilion rockfish	1	<1
			Unidentified rockfish	1	<1
			Unidentified ronquill	1	<1
TOTAL	1,936	87	TOTAL	3,835	129
Minimum number of species	23		Minimum number of species	22	
Total rockfish YOY	8	<1	Total rockfish YOY	21	<1
Total rockfishes	1,341	61	Total rockfishes	3,623	124
Rockfish YOY comprised <1% of all fishes surveyed.			Rockfish YOY comprised <1% of all fishes surveyed.		
All rockfishes comprised 69.3% of all fishes surveyed.			All rockfishes comprised 94.5% of all fishes surveyed.		

PLATFORM SHELL MOUNDS, cont.

PLATFORM HARVEST (Surveyed 1997–2000)			PLATFORM HERMOSA (Surveyed 1997–2000)		
Species	Number	Density	Species	Number	Density
Stripetail rockfish	373	14	Halfbanded rockfish	3,572	188
Greenstriped rockfish	136	5	Shortbelly rockfish	114	6
Sharpchin rockfish	91	3	Stripetail rockfish	64	3
Greenspotted rockfish	41	2	Shortspine combfish	38	2
Unidentified poacher	18	<1	Greenspotted rockfish	27	1
<i>Sebastomus</i> sp.	17	<1	Greenstriped rockfish	14	<1
Lingcod	16	<1	Unidentified sanddab	11	<1
Greenblotched rockfish	9	<1	Lingcod	9	<1
Unidentified rockfish	8	<1	Unidentified combfish	9	<1
Unidentified flatfish	7	<1	Flag rockfish	6	<1
Shortspine combfish	7	<1	<i>Sebastomus</i> sp.	6	<1
Unidentified combfish	6	<1	Cowcod	4	<1
Pinkrose rockfish	5	<1	Unidentified poacher	3	<1
Unidentified rockfish YOY	5	<1	Greenblotched rockfish	3	<1
Halfbanded rockfish	4	<1	Unidentified fish	3	<1
Unidentified fish	3	<1	Longspine combfish	2	<1
Chilipepper	2	<1	Pink seaperch	2	<1
Bank rockfish	1	<1	Rosy rockfish	2	<1
Cowcod	1	<1	Unidentified rockfish YOY	2	<1
Flag rockfish	1	<1	Blackeye goby	1	<1
Pacific hake	1	<1	Ratfish	1	<1
Ratfish	1	<1	Widow rockfish	1	<1
<i>Rathbunella</i> sp.	1	<1	Unidentified rockfish	1	<1
Swordspine rockfish	1	<1			
Unidentified sanddab	1	<1	TOTAL	3,895	200
			Minimum number of species	17	
TOTAL	756	24	Total rockfish YOY	2	<1
Minimum number of species	18		Total rockfishes	3,814	
Total rockfish YOY	5	<1	Rockfish YOY comprised <1% of all fishes surveyed.		
Total rockfishes	695	24	All rockfishes comprised 97.9% of all fishes surveyed.		
Rockfish YOY comprised <1% of all fishes surveyed.					
All rockfishes comprised 91.9% of all fishes surveyed.					

PLATFORM SHELL MOUNDS, cont.

PLATFORM HOLLY (Surveyed 1997, 1998, 2001)

Species	Number	Density
Pacific sardine	200	25
Calico rockfish	129	16
Vermilion rockfish	64	8
Copper rockfish	44	5
Halfbanded rockfish	35	4
Blackeye goby	31	4
Squarespot rockfish	21	3
Pink seaperch	18	2
Lingcod	14	2
Honeycomb rockfish	13	2
Painted greenling	13	2
Flag rockfish	11	1
Rosy rockfish	9	1
Canary rockfish	8	<1
Brown rockfish	6	<1
Kelp greenling	6	<1
Pile perch	6	<1
Unidentified fish	6	<1
<i>Rathbunella</i> sp.	5	<1
<i>Sebastomus</i> sp.	5	<1
Unidentified flatfish	4	<1
Unidentified ronquill	4	<1
Olive rockfish	3	<1
Pacific hake	3	<1
Unidentified combfish	3	<1
Unidentified rockfish	2	<1
California halibut	1	<1
California scorpionfish	1	<1
Sharpnose seaperch	1	<1
Treefish	1	<1
Widow rockfish	1	<1
<i>Sebastomus</i> sp.	1	<1
Unidentified seaperch	1	<1
Unidentified rockfish YOY	1	<1
TOTAL	670	75
Minimum number of species	26	
Total rockfish YOY	1	<1
Total rockfishes	354	40

Including the one-time observation of Pacific sardine, YOY rockfishes comprised <1%, and all rockfishes comprised 52.8% of all fishes surveyed.

Excluding sardines, YOY rockfishes comprised <1%, and all rockfish comprised 75.3% of all fishes.

PLATFORM C (Surveyed 2000)

Species	Number	Density
Vermilion rockfish	153	74
Halfbanded rockfish	59	29
Calico rockfish	33	16
Olive rockfish	19	9
Blackeye goby	16	8
Copper rockfish	15	7
Painted greenling	10	5
Kelp rockfish	9	4
Lingcod	8	4
Brown rockfish	1	<1
Canary rockfish	1	<1
Widow rockfish	1	<1
Yellowtail rockfish	1	<1
TOTAL	326	156
Minimum number of species	13	
Total rockfishes	292	139
All rockfishes comprised 89.5% of all fishes surveyed.		

PLATFORM SHELL MOUNDS, cont.

PLATFORM GRACE (Surveyed 1997–2001)

Species	Number	Density
Halfbanded rockfish	4,154	144
Shiner perch	1,031	36
Pink seaperch	171	6
Unidentified sanddab	148	5
Bocaccio YOY	91	3
Lingcod	88	3
Unidentified rockfish YOY	80	3
Greenspotted rockfish	38	1
Flag rockfish	35	1
Vermilion rockfish	34	1
Shortspine combfish	27	<1
Unidentified combfish	26	<1
Hornyhead turbot	15	<1
Painted greenling	10	<1
Blue rockfish	8	<1
<i>Sebastomus</i> sp.	5	<1
Bocaccio	4	<1
Canary rockfish	4	<1
Swordspine rockfish	4	<1
California scorpionfish	2	<1
Copper rockfish	2	<1
Kelp greenling	2	<1
<i>Rathbunella</i> sp.	2	<1
Rosy rockfish	2	<1
Unidentified flatfish	2	<1
Greenstriped rockfish	1	<1
Hornyhead turbot	1	<1
Squarespot rockfish	1	<1
Treefish	1	<1
Unidentified fish	1	<1
Unidentified rockfish	1	<1
Unidentified seaperch	1	<1
TOTAL	5,992	203
Minimum number of species	25	
Total rockfish YOY	171	6
Total rockfishes	4,464	153
Rockfish YOY comprised <1% of all fishes surveyed.		
All rockfishes comprised 74.5% of all fishes surveyed.		

PLATFORM GAIL (Surveyed 1997, 1999–2001)

Species	Number	Density
Pacific hake	470	15
Stripetail rockfish	242	8
Northern anchovy	158	5
Pinkrose rockfish	112	4
Greenblotched rockfish	65	2
Greenstriped rockfish	60	2
Unidentified poacher	46	2
Unidentified combfish	29	<1
Swordspine rockfish	25	<1
Shortbelly rockfish	23	<1
Sharpchin rockfish	18	<1
Darkblotched rockfish	12	<1
Dover sole	11	<1
Unidentified fish	11	<1
<i>Sebastomus</i> sp.	9	<1
Unidentified rockfish	9	<1
Pacific sanddab	8	<1
Unidentified rockfish YOY	8	<1
Unidentified sculpin	8	<1
Greenspotted rockfish	8	<1
Jack mackerel	7	<1
Blackgill rockfish	5	<1
Chilipepper	4	<1
Unidentified flatfish	4	<1
Cowcod	3	<1
Flag rockfish	3	<1
Mexican rockfish	3	<1
Pacific electric ray	2	<1
Unidentified ronquill	2	<1
Bocaccio	1	<1
California smoothtongue	1	<1
California tonguefish	1	<1
Halfbanded rockfish	1	<1
Redbanded rockfish	1	<1
Rex sole	1	<1
TOTAL	1,371	38
Minimum number of species	30	
Total rockfish YOY	8	<1
Total rockfishes	603	16
Rockfish YOY comprised <1% of all fishes surveyed.		
All rockfishes comprised 44.0% of all fishes surveyed.		

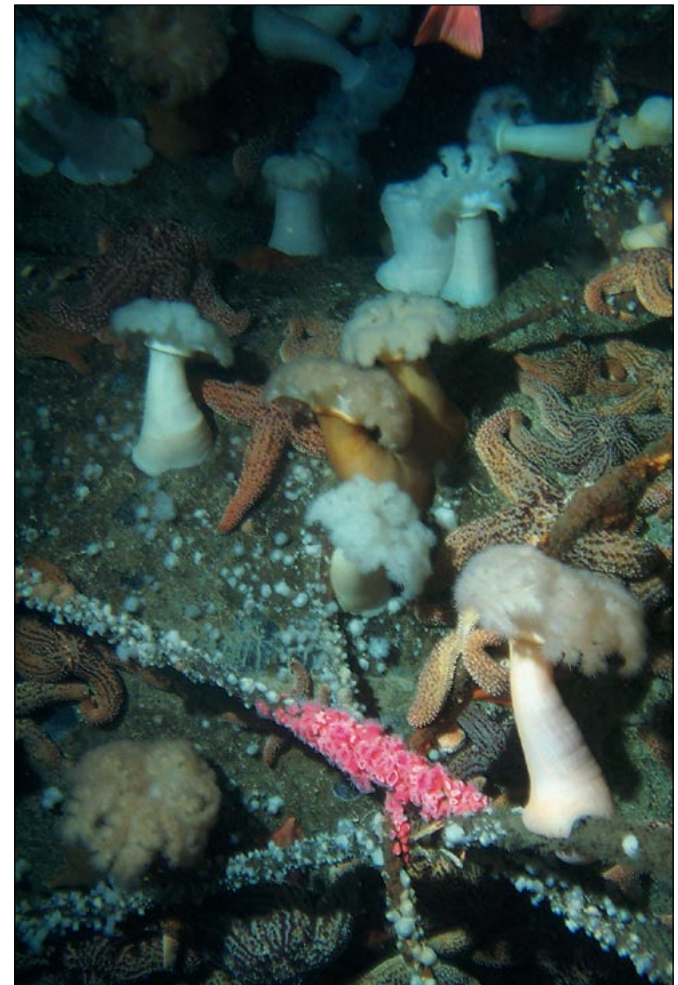
PLATFORM SHELL MOUNDS, cont.

PLATFORM EDITH (Surveyed 1998)

Species	Number	Density
California scorpionfish	280	67
Blackeye goby	81	19
Unidentified fish	3	<1
Unidentified rockfish YOY	3	<1
Unidentified seaperch	3	<1
Calico rockfish	2	<1
Sharpnose seaperch	2	<1
Painted greenling	1	<1
Pile seaperch	1	<1
Unidentified flatfish	1	<1
TOTAL	377	0.86
Minimum number of species	8	
Total rockfish YOY	3	<1
Total rockfishes	5	<1

Rockfish YOY comprised <1% of all fishes surveyed.

All rockfishes comprised <1% of all fishes surveyed.



DONNA SCHROEDER

An invertebrate tossed salad at the bottom of Platform Grace.

APPENDIX 4

Densities, at the top 20 sites, of some of the most abundant species in our deepwater surveys. Platforms are listed in blue, natural outcrops in red.

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)
Lingcod (adult)	Hidalgo	1996	Bottom	3.2
	Irene	1997	Bottom	1.7
	Irene	1997	Shell Mound	1.5
	Hermosa	1996	Bottom	1.0
	Footprint	2001	Natural	1.0
	Hermosa	1997	Bottom	0.9
	Reef "A"	1997	Natural	0.8
	Reef "A"	1998	Natural	0.7
	Hermosa	1999	Bottom	0.7
	Gail	2001	Bottom	0.7
	Santa Monica Bay	2001	Natural	0.7
	Santa Cruz I.	2000	Natural	0.6
	Santa Monica Bay	2001	Natural	0.5
	Hermosa	2000	Bottom	0.5
	Gail	1996	Bottom	0.5
	Gail	1997	Bottom	0.5
	Gail	1999	Bottom	0.5
	GAIL	2000	Bottom	0.5
	Irene	1998	Bottom	0.5
	Irene	2000	Bottom	0.5
Irene	2001	Bottom	0.5	
Lingcod (juvenile)	Irene	1996	Bottom	18.8
	Holly	1999	Bottom	6.1
	Grace	2000	Shell Mound	5.4
	Grace	2001	Platform pipe	4.6
	14 Mile Bank	2001	Natural	4.5
	Grace	2000	Bottom	3.8
	Hidalgo	1999	Shell mound	3.6
	Platform "C"	2000	Shell mound	3.4
	Grace	2001	Shell mound	3.2
	Irene	2001	Bottom	2.7
	Hidalgo	1997	Bottom	2.7
	Grace	1999	Shell Mound	2.3
	Harvest	2000	Bottom	2.2
	Grace	2001	Bottom	2.2
	Irene	1999	Bottom	2.2
	Hidalgo	2000	Bottom	2.1
	Harvest	1999	Bottom	1.9
	More Mesa	1995	Natural	1.9
	Irene	1997	Shell Mound	1.9
	12 Mile Reef	2000	Natural	1.8
Lingcod YOY	Irene	1998	Shell Mound	31.5
	Irene	2001	Shell Mound	29.2
	Irene	2001	Bottom	24.1
	Irene	1998	Bottom	19.6
	Irene	1996	Bottom	17.9
	Irene	2000	Shell Mound	12.0
	Irene	1997	Shell Mound	10.9
	Irene	2000	Bottom	10.6

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)	
Lingcod YOY (cont.)	Irene	1999	Shell Mound	9.7	
	Irene	1999	Bottom	7.5	
	Hidalgo	1999	Shell Mound	4.6	
	Hidalgo	2000	Shell Mound	4.3	
	Hidalgo	2000	Bottom	3.0	
	Irene	1997	Bottom	2.9	
	Hidalgo	2001	Shell Mound	2.6	
	Hidalgo	1998	Shell Mound	1.9	
	Hidalgo	1997	Shell Mound	1.8	
	Grace	1999	Shell Mound	1.2	
	Hidalgo	1998	Bottom	1.1	
	Hidalgo	1999	Bottom	1.1	
	Painted greenling	Holly	1998	Midwater	18.0
		Harvest	1999	Midwater	9.9
Harvest		1997	Midwater	9.9	
Holly		2001	Midwater	8.2	
Hermosa		1997	Midwater	8.1	
Irene		1997	Bottom	8.0	
Hermosa		1998	Midwater	6.9	
Hermosa		1999	Midwater	5.5	
Houchin		2000	Midwater	5.3	
Irene		1997	Shell Mound	5.3	
Irene		2000	Shell Mound	5.1	
Irene		1996	Bottom	4.8	
Harvest		1999	Midwater	4.7	
Holly		1998	Shell Mound	4.6	
Irene		2000	Bottom	4.6	
Irene		2000	Midwater	4.5	
Platform "C"		2000	Shell Mound	4.4	
Hermosa		2000	Midwater	4.4	
Irene		2001	Bottom	4.4	
Greenspotted rockfish		Hidalgo	2000	Midwater	4.2
	Hermosa	1996	Bottom	30.3	
	Hidalgo	2000	Bottom	21.8	
	Gail	1996	Bottom	21.3	
	Hidalgo	1996	Bottom	20.6	
	Hidalgo	1999	Bottom	19.9	
	Hidalgo	1998	Bottom	19.1	
	Hidalgo	1997	Bottom	17.6	
	Hidalgo	2001	Bottom	12.1	
	Gail	1997	Bottom	10.8	
	Hermosa	1997	Bottom	10.6	
	North Reef	1997	Natural	9.8	
	Gail	2000	Bottom	9.3	
	Hermosa	1998	Bottom	9.1	
	Hermosa	2000	Bottom	5.8	
Reef "A"	1997	Natural	5.0		
North Reef	1998	Natural	5.0		
Reef "C"	1999	Natural	4.9		

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)
Greenspotted rockfish (cont.)	Reef "A"	2000	Natural	4.8
	Hermosa	1999	Bottom	4.3
Copper rockfish	Grace	1996	Bottom	4.0
	Irene	2000	Bottom	88.5
	Irene	1996	Bottom	71.6
	Irene	1997	Bottom	53.6
	Irene	2001	Bottom	40.8
	Irene	2000	Shell Mound	27.1
	Holly	1997	Bottom	21.8
	Holly	1999	Bottom	21.5
	Irene	1999	Bottom	21.5
	Holly	1998	Shell Mound	12.0
	Holly	1996	Bottom	11.4
	Irene	2001	Shell Mound	10.4
	Irene	1998	Bottom	10.4
	Holly	1997	Shell Mound	9.3
	Holly	2001	Bottom	8.4
	Platform "C"	2000	Shell Mound	7.3
	Swordspine rockfish	Irene	1997	Shell Mound
Irene		1999	Shell Mound	4.5
Holly		1998	Bottom	4.4
Irene		2001	Midwater	3.9
Irene		2000	Midwater	3.7
14 Mile Bank		1996	Natural	94.4
14 Mile Bank		1996	Natural	47.4
14 Mile Bank		2001	Natural	45.8
Footprint		2000	Natural	41.0
Footprint		2000	Natural	39.6
Footprint		1999	Natural	29.7
Osborn Bank		2000	Natural	27.5
Footprint		2001	Natural	24.9
Catalina I.		1996	Natural	22.4
Santa Monica Bay		2001	Natural	21.9
Greenstriped rockfish	Tanner Bank	1997	Natural	20.1
	Footprint	2000	Natural	20.1
	Santa Barbara I.	2000	Natural	18.3
	Footprint	2001	Natural	15.3
	Footprint	2000	Natural	14.2
	Cortes Bank	1997	Natural	12.8
	Santa Monica Bay	1998	Natural	10.6
	Footprint	2001	Natural	9.9
	Footprint	2000	Natural	8.3
	Footprint	1999	Natural	8.2
	Harvest	2000	Bottom	14.7
	Harvest	1999	Bottom	9.2
Gail	2000	Bottom	7.5	
Harvest	1997	Shell Mound	7.1	
Harvest	1997	Shell Mound	6.1	
Harvest	2000	Shell Mound	5.9	

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)	
Greenstriped rockfish (cont.)	Harvest	1998	Bottom	5.2	
	Harvest	1999	Shell Mound	4.3	
	Harvest	1997	Bottom	3.6	
	Harvest	1998	Shell Mound	3.5	
	Hidalgo	1998	Bottom	3.4	
	Hidalgo	2000	Bottom	3.4	
	Reef "A"	2000	Natural	3.3	
	Gail	1997	Shell Mound	2.6	
	Reef "A"	1997	Natural	2.5	
	Gail	1999	Shell Mound	2.4	
	Hidalgo	2001	Bottom	2.3	
	Gail	2000	Shell Mound	2.2	
	Santa Rosa Passage	1995	Natural	2.2	
	Hidalgo	1998	Shell Mound	2.1	
	Widow rockfish (YOY)	Irene	1998	Midwater	344.0
		Irene	1996	Midwater	253.3
Holly		1999	Bottom	252.9	
Harvest		1999	Midwater	188.9	
Grace		2000	Midwater	175.7	
Irene		1997	Midwater	173.6	
San Nicholas I.		1996	Natural	173.5	
Catalina I.		1996	Natural	116.8	
Irene		1998	Bottom	79.1	
Grace		2001	Midwater	73.8	
San Nicolas I.		1996	Natural	68.1	
Grace		1997	Bottom	66.3	
Cortes Bank		1997	Natural	66.0	
Santa Cruz I.		2000	Natural	65.4	
North Reef		1999	Natural	63.6	
Hidalgo		1998	Midwater	52.9	
Footprint		1995	Natural	45.9	
Hermosa		2000	Midwater	44.4	
Footprint		2001	Natural	40.3	
Grace		1999	Midwater	39.6	
Squarespot rockfish	Santa Cruz I.	2000	Natural	282.5	
	Santa Barbara I.	2000	Natural	263.0	
	Santa Monica Bay	1998	Natural	196.4	
	Harvest	1999	Midwater	180.0	
	Cortes Bank	1997	Natural	149.6	
	Grace	2001	Midwater	130.6	
	San Miguel I.	1995	Natural	122.1	
	Footprint	1998	Natural	94.6	
	San Nicolas I.	1996	Natural	93.9	
	Anacapa Passage	1999	Natural	88.8	
	Santa Monica Bay	1998	Natural	85.0	
	Hidden Reef	1999	Natural	72.6	
	San Nicolas I.	1996	Natural	69.7	
	Guano Bank	1995	Natural	69.6	
	Footprint	2000	Natural	61.8	

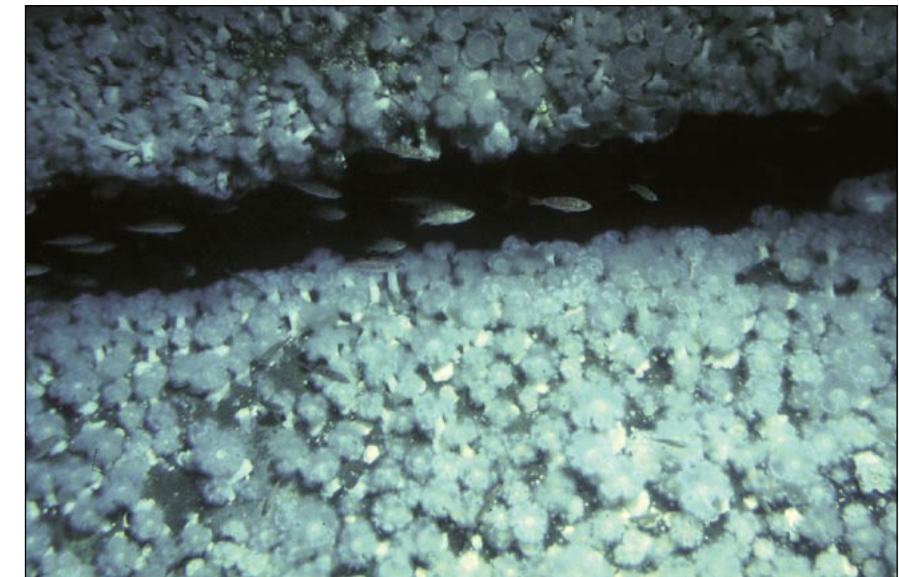
Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)
Squarespot rockfish (cont.)	Osborn Bank	2000	Natural	54.9
	Osborn Bank	2000	Natural	51.9
Vermilion rockfish	Anacapa Passage	1995	Natural	50.5
	Santa Monica Bay	2001	Natural	44.3
	Santa Rosa I.	1995	Natural	43.4
	Platform "C"	2000	Shell Mound	74.5
	Holly	2001	Bottom	58.1
	Irene	2000	Bottom	55.2
	Irene	1996	Bottom	47.8
	Irene	1997	Bottom	32.8
	Grace	2001	Platform pipe	30.8
	Irene	1999	Bottom	30.4
	Anacapa Passage	1995	Natural	30.1
	Grace	2001	Bottom	29.9
	Holly	1999	Bottom	23.8
	Holly	1996	Bottom	22.0
	Irene	2001	Bottom	14.0
	Irene	1998	Bottom	12.5
Holly	2001	Shell Mound	11.9	
Irene	2000	Shell Mound	10.6	
Grace	2001	Bottom	8.8	
Holly	1998	Shell Mound	8.3	
Irene	2001	Shell Mound	6.1	
Santa Cruz I.	2000	Natural	5.2	
Holly	1997	Bottom	4.5	
Bocaccio (adult)	Gail	1997	Bottom	18.2
	Gail	1999	Bottom	11.0
	Gail	1996	Bottom	10.8
	Gail	2000	Bottom	6.2
	Gail	2001	Bottom	3.5
	Hidalgo	2001	Bottom	3.0
	Hidalgo	1996	Bottom	2.7
	Reef "A"	1997	Natural	1.9
	Reef "D"	1999	Natural	1.6
	Hidalgo	1997	Bottom	1.3
	Santa Rosa Passage	1995	Natural	1.2
	Footprint	1995	Natural	1.1
	Hidalgo	1998	Bottom	0.9
	Footprint	2001	Natural	0.9
	Footprint	2001	Natural	0.9
	Footprint	2000	Natural	0.8
Footprint	2000	Natural	0.7	
Catalina I.	1996	Natural	0.6	
Footprint	1999	Natural	0.6	
San Nicolas I.	1996	Natural	0.6	
Bocaccio (juvenile)	Grace	2000	Bottom	39.6
	Grace	2000	Midwater	13.0
	Santa Cruz I.	2000	Natural	5.6
	14 Mile Bank	2001	Natural	5.1

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)	
Bocaccio (juvenile) (cont.)	Santa Barbara I.	2000	Natural	2.5	
	Santa Monica Bay	2001	Natural	2.4	
	Gail	2001	Bottom	2.3	
	Osborn Bank	2000	Natural	2.3	
	12 Mile Reef	2000	Natural	2.0	
	Gail	2000	Bottom	1.8	
	Footprint	2000	Natural	1.2	
	Grace	2001	Platform pipe	0.9	
	Reef "A"	1997	Natural	0.9	
	Footprint	2000	Natural	0.8	
	Hidalgo	2000	Bottom	0.8	
	Gail	1997	Bottom	0.7	
	Footprint	2000	Natural	0.6	
	Grace	2000	Shell Mound	0.6	
	Hidalgo	1996	Bottom	0.6	
	Hidalgo	2001	Bottom	0.6	
	Bocaccio (YOY)	Irene	1999	Midwater	166.4
		Irene	1996	Midwater	91.8
		Grace	1999	Bottom	44.9
		Grace	1999	Midwater	24.1
Irene		1997	Midwater	17.2	
Grace		1999	Shell Mound	15.9	
Hidalgo		1996	Midwater	5.6	
Harvest		1999	Midwater	4.0	
Grace		2001	Midwater	3.0	
Hidden Reef		1999	Natural	2.3	
Irene		1999	Bottom	2.2	
Grace		2001	Midwater	1.5	
Harvest		1999	Midwater	1.3	
Santa Barbara I.		1996	Natural	1.3	
Irene		1997	Bottom	1.2	
Harvest		1997	Midwater	1.1	
Grace		2000	Midwater	1.0	
Hidalgo		1997	Midwater	0.9	
Canary rockfish		Santa Monica Bay	2001	Natural	0.9
		Hidalgo	2000	Bottom	0.8
	Irene	2001	Bottom	5.5	
	Holly	2001	Bottom	3.4	
	Hidalgo	1999	Bottom	1.9	
	Holly	2001	Shell Mound	1.7	
	Hidalgo	1998	Bottom	1.7	
	North Reef	1999	Natural	1.7	
	Reef "D"	1999	Natural	1.6	
	Hidalgo	1996	Bottom	1.3	
	Reef "A"	1999	Natural	1.2	
	Irene	1997	Bottom	1.2	
	Reef "B"	1997	Natural	1.1	
	Hidalgo	1997	Bottom	0.9	
	Hidalgo	2001	Bottom	0.9	

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)
Greenblotched rockfish	Grace	2000	Bottom	0.9
	Holly	1996	Bottom	0.8
	North Reef	2000	Natural	0.7
	Reef "C"	1998	Natural	0.7
	Irene	2001	Shell Mound	0.7
	Reef "A"	1998	Natural	0.5
	Grace	1998	Shell Mound	0.5
	Gail	1997	Bottom	17.7
	Gail	1999	Bottom	13.7
	Gail	2001	Bottom	11.3
	Hidalgo	2001	Bottom	10.6
	Gail	1996	Bottom	9.7
	Gail	2000	Bottom	9.2
	Gail	1997	Shell Mound	5.9
	Harvest	1999	Bottom	4.6
	Harvest	1998	Bottom	3.8
	Gail	1999	Shell Mound	3.3
	Harvest	1997	Bottom	1.6
	San Miguel I.	1995	Natural	1.4
	Hidalgo	1999	Bottom	1.3
North Reef	1997	Natural	1.0	
Footprint	2001	Natural	1.0	
Reef "A"	1999	Natural	0.9	
Reef "B"	1997	Natural	0.8	
Hidalgo	2000	Bottom	0.8	
North Reef	2001	Natural	0.7	
Gail	2001	Shell Mound	0.7	
Flag rockfish	Hidalgo	1997	Bottom	15.5
	Hidalgo	1996	Bottom	11.0
	Hidalgo	1999	Bottom	7.2
	Grace	1996	Bottom	6.6
	Grace	2001	Bottom	5.7
	Hidalgo	1998	Bottom	5.5
	Hidalgo	2000	Bottom	5.1
	Grace	2000	Bottom	4.4
	Hidalgo	2001	Bottom	3.8
	Holly	2001	Bottom	3.1
	Grace	2001	Bottom	3.1
	Santa Barbara Point	1995	Natural	3.0
	Hermosa	1996	Bottom	2.7
	Grace	1999	Midwater	2.6
	Gail	1999	Midwater	2.5
	Hermosa	2000	Bottom	2.2
	Grace	2001	Shell Mound	2.2
	Santa Rosa Passage	1995	Natural	2.0
	Holly	1998	Shell Mound	1.8
	Holly	2001	Shell Mound	1.7

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)	
Halfbanded rockfish	Hidalgo	2000	Bottom	907.1	
	Grace	1997	Bottom	800.5	
	Anacapa I.	1999	Natural	703.1	
	Irene	1999	Bottom	621.2	
	Irene	1998	Bottom	595.9	
	Hidalgo	2000	Shell Mound	461.0	
	Grace	1999	Shell Mound	415.1	
	Hermosa	2000	Shell Mound	406.9	
	Grace	2000	Bottom	405.2	
	Hermosa	2000	Bottom	398.1	
	Grace	1996	Bottom	395.1	
	Hermosa	1997	Bottom	381.4	
	Grace	1999	Bottom	344.2	
	Hidalgo	2001	Bottom	318.4	
	Hermosa	1999	Bottom	313.2	
	E. End Anacapa I.	1995	Natural	284.9	
	Hidalgo	1999	Bottom	275.8	
	Grace	2001	Bottom	266.4	
	Grace	2001	Shell Mound	259.1	
	Grace	2001	Bottom	237.7	
	Pygmy rockfish	Hidden Reef	1999	Natural	263.7
		San Nicolas I.	1996	Natural	236.9
		Footprint	2001	Natural	125.7
Cortes Bank		1997	Natural	119.7	
North Reef		2000	Natural	93.8	
Santa Monica Bay		1998	Natural	93.7	
San Miguel I.		1995	Natural	87.3	
Santa Monica Bay		2001	Natural	84.1	
Cortes Bank		1997	Natural	76.7	
Footprint		2000	Natural	72.2	
Santa Cruz I.		2000	Natural	71.9	
Osborn Bank		2000	Natural	71.2	
San Nicolas I.		1996	Natural	64.6	
14 Mile Bank		2001	Natural	64.5	
San Nicolas I.		1996	Natural	64.2	
Santa Rosa I.		1995	Natural	60.6	
Footprint		2000	Natural	54.6	
Reef "D"		1999	Natural	47.0	
Footprint		1999	Natural	42.3	
Santa Monica Bay		2001	Natural	38.3	
Pink seaperch		Santa Monica Bay	1998	Natural	304.5
		Grace	1998	Shell Mound	39.2
		Holly	1998	Shell Mound	11.1
	Holly	1999	Bottom	9.1	
	Catalina I.	1996	Natural	4.0	
	Grace	1997	Shell Mound	2.9	
	Grace	1997	Bottom	2.7	
	Holly	1996	Bottom	1.8	

Species	Site	Year	Habitat Type	Density(Fish per 100 m ²)
Pink seaperch (cont.)	Reef "D"	1999	Natural	1.7
	Santa Monica Bay	1997	Natural	1.3
	Holly	1997	Bottom	1.3
	Catalina I.	1996	Natural	1.2
	Holly	1997	Shell Mound	1.2
	Santa Monica Bay	1997	Natural	1.2
	Santa Rosa I.	1995	Natural	1.2
	Grace	2000	Bottom	1.1
	Grace	2001	Platform pipe	1.0
	Reef "A"	1997	Natural	0.9
Yellowtail rockfish (adult)	Santa Cruz I.	1996	Natural	0.8
	North Reef	1998	Natural	0.8
	Reef "B"	1995	Natural	3.9
	San Miguel I.	1995	Natural	3.5
	North Reef	1996	Natural	2.8
	North Reef	1995	Natural	2.1
	Santa Rosa I.	1995	Natural	2.1
	San Miguel I.	1995	Natural	1.9
	San Miguel I.	1995	Natural	1.7
	Reef "D"	1999	Natural	1.6
	North Reef	2000	Natural	1.5
	Reef "A"	2000	Natural	1.0
	San Miguel I.	1995	Natural	0.7
	Reef "A"	1998	Natural	0.7
	Reef "B"	1997	Natural	0.5
	North Reef	1999	Natural	0.5
Santa Rosa I.	1995	Natural	0.4	
Reef "A"	1997	Natural	0.3	
North Reef	1997	Natural	0.3	
Santa Rosa I.	1995	Natural	0.2	
North Reef	1998	Natural	0.2	



Young-of-the-year rockfish in the platform midwater.

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