

Appendix 1. Kilometers surveyed by the ROV at both exploratory and quantitative sites from 2003 to 2007.

<b>Island</b> Site Name	Site Code	Nov 2003	May 2004	Sep 2004	Aug- Oct 2005	Aug- Oct 2006	Aug- Oct 2007
<b>San Miguel Island</b>							
Harris Point SMR	SMI-1	--	--	--	15	8	7
Castle Rock	SMI-2	--	--	--	10	5	4
<b>Santa Rosa Island</b>							
Carrington Point SMR	SRI-1	2	--	--	--	--	--
Carrington Point SMR	SRI-2	2	--	12	7	8	7
Rodes Reef	SRI-3	2	--	12	6	8	6
Cluster Point	SRI-4	1	--	--	--	--	--
South Point SMR	SRI-5	1	--	--	--	--	--
East Point	SRI-6	--	4	12	12	11	9
Cluster Point	SRI-7	--	--	--	10	9	6
South Point SMR	SRI-8	--	--	--	13	8	8
<b>Santa Cruz Island</b>							
Gull Island SMR	SCI-1	4	--	--	--	--	--
Gull Island SMR	SCI-2	4	--	12	13	11	11
Bowen Point	SCI-3	2	--	--	--	--	--
Blue Banks Arch	SCI-4	--	3	--	--	--	--
<b>Anacapa Island</b>							
Anacapa SCA	AI-1	--	3	9	12	9	7
Anacapa SMR	AI-2	--	3	--	--	--	--
Anacapa SMR	AI-3	--	3	--	19	8	9
Arch Rock	AI-4	--	3	--	--	--	--
	<b>Total</b>	<b>18</b>	<b>18</b>	<b>57</b>	<b>117</b>	<b>85</b>	<b>74</b>

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## Appendix 2. ROV data collection and post-processing complete methods for 2007.

### ROV Equipment

The basic ROV equipment used was similar to that described by Veisze and Karpov (2002) with some improvements. The ROV used in this study was a Deep Ocean Engineering model Phantom® HD 2+2<sup>1</sup>. The ROV was equipped with a three-axis autopilot including a rate gyro-damped compass card. Together, these allowed the pilot to maintain a constant heading ( $\pm 1$  degree) and constant depth ( $\pm 0.3$ m) with minimal corrections. In addition, a forward cruise control was added to help the pilot maintain a constant forward velocity.

A Trackpoint II® acoustic positioning system was used to reference the ROV position relative to the ship's Wide Area Augmentation System GPS (WAAS GPS). WAAS GPS has an accuracy of 3.2 m (Wilson unpublished <http://www.users.erols.com/dlwilson/gpswaas.htm>). The Trackpoint II® calculated the XY position of the ROV at approximately two-second intervals. The position was recorded in meters as X and Y using the WGS 1984 UTM coordinate system in both ARC VIEW® 8.4 and HYPAC® navigational software. Measurements of ROV heading and depth, water temperature, camera tilt, and sonar distance both forward and downward to the substrate were averaged over a one-second period and recorded by HYPAC®.

The ROV was equipped with two color cameras, one facing forward and set approximately 20° below the horizon and the other pointing downwards at 85°. The two-camera system provided a continuous, slightly overlapping view forward and downward. Digital video for both the forward and down facing cameras was captured using SONY® DSR 45s and Pioneer DVR510s. Data collection protocols require a minimum of 3 m of water visibility. In addition to capturing biological and habitat observations, the forward video captured redundant onscreen recordings of time code, depth, temperature, range, forward camera angle, and heading.

GPS time was used to provide a basis for linking position, field data, and video observations (Veisze and Karpov 2002). A Horita® GPS3 and WG-50 were used to generate on screen displays of GPS time, as well as output audio time code data for capture on SONY® DSR audio tracks at an interval of 1/30<sup>th</sup> of a second. This method was improved by customizing HYPAC® navigational software to link all data collected in the field to the GPS time. ROV tracked position and sensor data was recorded directly by HYPAC® as a time-linked text file. A redundant one-second time code file of sensor data was also collected in the field using Deep Oceans HD2 OSD® operating system software with time code extracted from the system's internal clock.

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<sup>1</sup> Use of trade names does not indicate an endorsement of any product by the California Department of Fish and Game.

All data collected by the ROV, along with subsequent observations extracted during post-processing of the video, were linked in a Microsoft Access® database using GPS time. Data management software was developed to expand all data records to one second of GMT time code. During video post-processing, a Horita® Time Wedge (model number TCW50) was used in conjunction with a computer to record the audio time code in a Microsoft Access® database.

### **ROV Sampling Operations**

Individual ROV dives were limited to approximately 2 hours (3 km) each due to DVD recording capability. When 2 hours of DVD recording was reached, a new dive was initiated, often while the ROV remained on the seafloor. Surveys were conducted between the hours of 0800 and 1700 PST to avoid twilight conditions that might affect fish abundances.

At each site, the ROV was flown along pre-planned track lines, targeting  $\pm 10$  m of the line. GPS time was recorded on each video frame (1/30<sup>th</sup> sec) and on an audio track using methods developed by Veisze and Karpov (2002). ROV sensor data for water depth, temperature, ROV heading, ranging sonar, and camera tilt angle were also recorded. A pair of Tritech® 500 kHz ranging sonars, which measure distance across a 0.1–10 m range using a 6° conical transducer, was added in 2003 to replace paired lasers as the primary method for measuring transect width. The ranging sonars were secured to both the forward and downward facing cameras and measured the distance from the camera to the sea floor. Readings from these sonars were averaged five times per second and recorded at a one-second interval with all other sensor data.

The ROV was flown off the vessel's stern using a "live boat" technique that employed a 227 kg (600 lb) clump weight. Using this method, all but 40 m of the ROV umbilical was secured from current-induced drag by coupling it with the clump weight cable and suspending the clump weight at least 10 m off the bottom. The 40 m tether allowed the ROV pilot to maintain a constant speed (0.5 to 0.75 m/sec) and a straight course down the planned line by using the location of the ship, the ROV and its calculated speed, and the track line displayed on shipboard monitors. The ship's captain also used the displays to maintain the position of the ship within 30 m of the ROV. Three ridged foam floats were affixed to the 40 m tether to help keep the umbilical off the ocean floor and prevent snagging in high relief areas.

Track line width on the forward camera was calculated using the ranging sonar fixed below and parallel to the camera between two forward-facing red lasers spaced 110 mm apart. Measurements of transect width using a ranging sonar are accurate to  $\pm 0.1$  m (Karpov et al. 2006). The ROV pilot used the sonar reading to sustain a transect width between 2 and 4 m by maintaining the distance from the camera to the substrate (at the screen horizontal mid-point)

between 1.5 to 3 m. Transect width was computed each second based on the camera field of view as 1.3 times the ranging sonar distance.

### **Site and Track Line Selection**

With the aid of acoustic survey maps (sidescan and multibeam), study areas were selected inside and outside of marine reserves. Each area located within marine reserves was paired with a reference area located outside but not immediately adjacent to the reserve boundaries. Where possible, sites were selected offshore of Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) sites sampled by SCUBA. The reference sites were chosen based upon comparable criteria which included: distance to port, exposure, habitat (rocky substrate) and depth range. In order to cover patchy rock outcroppings, some sites were broken into adjoining 500 m wide rectangular zones.

Within each zone, GIS-based track lines for the site were randomly selected and placed across the width of each site parallel to the prevailing depth contour and bathymetry. The locations of the track lines were chosen by selecting random numbers, rounded to the nearest 10 m, from zero to the total length of the site in meters from shallow to deep. Numbers that did not produce line spacing of  $\geq 20$  m were rejected. This approach avoids overlapping of adjacent lines that are typically navigable within  $\pm 10$  m (Karpov et al. 2006). Track lines were numbered according to the distance along the site boundary running from shallow to deep.

To ensure that the sampling was distributed across the entire depth range, each site was divided into zones. Zones were structured depending on the site's depth and habitat composition. The total number of track lines selected within each zone was dependent on the size of the zone.

The number of 500 m lines selected at each site was determined based on available habitat data and a 10% buffer was added to allow for sampling losses (e.g., being pulled off course by the boat, flying too high off the bottom, temporary equipment failure, etc.). In case the amount of hard and mixed substrate was underestimated, additional auxiliary lines were randomly pre-selected and sequentially labeled. Thus, if the number of transects needed to be increased, a subset of the randomly selected lines could be added to each zone.

Areas determined to be mostly sand were excluded during the placement of random transect lines. These areas were defined from existing multibeam or sidescan sonar data and also by overlaying data from previous ROV surveys completed within the study site (Karpov et al. 2005a).

Two approaches were adopted to assess the amount of usable substrate and track line while at sea. First, a technique was applied to estimate in real-time the amount of soft-only substrate for track lines while sampling (Bergen et al. 2006).

During the survey of each line, the data officer recorded the total time spent over soft-only substrate, which was divided by the total time to survey the entire track line. Assuming constant velocity, this approximated post-processed estimates based on actual tracked distance. Real-time estimates allowed us to adjust the number of track lines surveyed by site to meet our sampling goals. The second approach adopted was to review the tracking data at the end of each sampling day for content and quality. If the quality was compromised, lines were repeated later in the survey.

### **Post-Processing**

Following the survey, positional data was post-processed to produce the final track lines. Positional information, in the form of XY metric coordinates, was filtered for outliers and smoothed using a 21-point running mean (Karpov et al. 2006). The distance formula was used to calculate planar length tracked per second and combined with width to calculate area tracked per second. Gaps in the tracking data that occurred due to deviations from quantitative protocols, such as pulls (ROV pulled back by tension on the 40 m tether), stops (ROV stops to let the boat catch up which affects tracking) or backsides of high relief structures (visual loss of 4 m target distance for more than 6 seconds which typically occurs on the downward slope of high relief habitat) were removed from the data prior to transect computation.

The remaining usable portions of the line were then divided into 25 m<sup>2</sup> segments (subunits). Component subunits were typically 8 to 10 m in length with a transect width averaging approximately 3 m. Each subunit's total percent hard and/or mixed habitat was then calculated and those with percentages below 50% were removed. The remaining subunits were concatenated into 100 m<sup>2</sup> transects (four sequential useable 25 m<sup>2</sup> subunits) for use in density calculations. A spacer subunit was discarded between each to avoid bias of contiguous transects. Using this method for generating transects has allowed us to focus on rocky substrate without the loss of rock/sand interface habitat.

### **Substrate and Habitat**

Substrate classification used during post-processing was simplified from Green et al. (1999). The video record was reviewed and substrate types encountered were classified independently as rock, boulder, cobble, or sand. Rock was defined as any igneous, metamorphic, or sedimentary substrate; boulder as rounded rock material that is between 0.25 and 3.0 m in diameter and clearly detached from the base substrate; cobble as rounded rock material that is between 6 and 25 cm in diameter and clearly detached; and sand as any granular material with a diameter less than 6 cm (may include mud, organic debris such as shell or bone, gravel, or pebble).

During review of a video record, a transparency film overlay with guidelines approximating a 1.5 m wide swath was placed over a monitor screen. Each of the substrate types are independent of each other and were recorded as discrete

segments with a beginning and ending GPS time code, thus the total available substrate often exceeds 100%. A substrate layer was considered continuous until a break of 2 m or greater occurred or the substrate dropped below 20% of the total combined substrates for a distance of at least 3 m.

After processing, the substrates were combined to create three independent habitat types: hard (rock and/or boulder), mixed (rock and/or boulder with either cobble and/or sand), or soft (cobble and/or sand). These habitat types combined total 100% of the available habitat.

### **Fish Abundance, Transects, and Descriptive Statistics**

Fish processing consisted of reviewing the video records in a single-pass method in which observed fish were identified to one of the following levels: species, complex, family, or unidentified (Appendix 3). Fish observations recorded were limited to a size greater than 11 cm with the exception of señorita (*Oxyjulis californica*), surf perch, and blacksmith (*Chromis punctipinnis*). Several fish species were excluded: skates, flatfish, young of the year (YOY) rockfish, pelagic species, painted greenling (*Oxylebius pictus*) and sculpins (except cabezon [*Scorpaenichthys marmoratus*]).

A screen overlay was also used during fish quantification to approximate the transect width, calculated by the ranging sonar, at mid-screen (Karpov et al. 2006). The overlay served as a guide for determining if a fish was in or out of the ROV transect. Fish enumeration was limited to a distance of approximately 4 meters, the lower working visibility of the ROV based on analysis by Karpov et al. (2006). Using the sonar range value depicted on the screen as a gauge, the processor determined if a fish was within 4 meters as it entered the viewing area. Fish that entered the viewing area were only counted if more than half the fish crossed the overlay guidelines.

In order to match the location of the fish with the habitat, time code entry was made when the fish crossed the mid-screen line. For fish that were within 4 meters, but swam away before they crossed the mid-screen line, time code entry was made when the location where the fish had been observed reached the mid-screen point. All data entries were recorded in a Microsoft Access® database linked with the time code.

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Appendix 3. Scientific and common names for quantified finfish in 2007.

Taxa	Scientific Name
Ocean whitefish	<i>Caulolatilus princeps</i>
Blacksmith	<i>Chromis punctipinnis</i>
Unidentified surfperch	<i>Embiotocidae</i>
Rock wrasse	<i>Halichoeres semicinctus</i>
Kelp greenling	<i>Hexagrammos decagrammus</i>
Lingcod	<i>Ophiodon elongatus</i>
Señorita	<i>Oxyjulis californica</i>
Kelp bass	<i>Paralabrax clathratus</i>
Pile perch	<i>Rhacochilus vacca</i>
California scorpionfish	<i>Scorpaena guttata</i>
Unidentified rockfish	Sebastes 1
Gopher/Copper complex	Sebastes 2
Canary/Vermilion complex	Sebastes 3
Olive/Yellowtail complex	Sebastes 4
Sebastomus complex	Sebastes 5
Kelp rockfish	<i>Sebastes atrovirens</i>
Gopher rockfish	<i>Sebastes carnatus</i>
Copper rockfish	<i>Sebastes caurinus</i>
Vermilion rockfish	<i>Sebastes miniatus</i>
Blue rockfish	<i>Sebastes mystinus</i>
Bocaccio	<i>Sebastes paucispinis</i>
Canary rockfish	<i>Sebastes pinniger</i>
Flag rockfish	<i>Sebastes rubrivinctus</i>
Treefish	<i>Sebastes serriceps</i>
California sheephead	<i>Semicossyphus pulcher</i>
Giant sea bass	<i>Stereolepis gigas</i>

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Appendix 4. Finfish abundances and sample size of 100 m<sup>2</sup> transects for all ten sites surveyed in 2007.

Common Name	SMI-1			SMI-2			SRI-2			SRI-3			SRI-7		
	Ave	SD	%FO	Ave	SD	%FO	Ave	SD	%FO	Ave	SD	%FO	Ave	SD	%FO
Black perch															
Blacksmith	0.02	0.21	1	0.03	0.22	2	0.97	4.45	11	0.03	0.23	2	0.12	1.09	2
Blue rockfish	0.60	2.11	18	0.50	1.76	14	1.10	3.40	17	0.40	1.11	17	0.25	0.75	14
Ca. Sheephead	0.05	0.26	3	0.09	0.32	8	0.06	0.28	5	0.04	0.21	4	0.08	0.17	3
Canary/Vermillion complex	0.02	0.15	2												
Copper rockfish	0.19	0.40	19	0.04	0.20	4	0.22	1.03	10	0.12	0.42	10	0.03	0.14	2
Gopher rockfish	0.17	0.41	16	0.02	0.14	2	0.03	0.18	3	0.03	0.18	3	0.03	0.17	3
Gopher/Copper complex	0.01	0.11	1	0.01	0.10	1				0.03	0.23	2			
Kelp bass															
Kelp greenling	0.01	0.11	1							0.01	0.10	1	0.01	0.29	6
Kelp rockfish							0.01	0.11	1						
Lingcod	0.09	0.29	9	0.01	0.10	1	0.01	0.11	1	0.04	0.25	3	0.03	0.17	3
Oceanwhite	0.01	0.11	1				0.02	0.22	1						
Pile perch	0.08	0.31	7	0.04	0.40	1	0.02	0.15	2	0.15	1.17	3	0.16	0.10	1
Sebastes	0.47	0.74	36	0.55	0.83	40	0.01	0.11	1	0.03	0.23	2	0.07	0.17	3
Senorita	0.23	2.13	1	0.02	0.20	1	0.03	0.32	1	0.31	1.63	11			
Treefish	0.08	0.27	8	0.03	0.17	3	0.01	0.11	1	0.01	0.10	1	0.02	0.25	7
Unidentified perch	0.27	1.10	8	0.23	1.55	6	0.06	0.39	2	0.11	0.48	5	0.11	0.27	8
Unidentified rockfish	0.20	0.59	13	0.03	0.17	3	0.03	0.18	3	0.04	0.21	4	0.07	0.46	19
Vermillion rockfish	1.09	1.53	58	0.20	0.50	17	0.38	1.17	20	0.40	1.27	13	0.21	0.48	6
Yellowtail/Olive complex	0.28	0.61	21	0.35	1.47	19	0.12	0.45	8	0.08	0.31	7	0.03	0.76	8
<b>Average</b>	0.22	0.64	12	0.14	0.54	8	0.19	0.79	5	0.12	0.51	6	0.09	0.38	6

## Appendix 4 continued.

Common Name	SRI-8			SRI-6			SCI-2			AI-3			AI-1		
	Ave	SD	%FO	Ave	SD	%FO	Ave	SD	%FO	Ave	SD	%FO	Ave	SD	%FO
Black perch				0.01	0.10	1									
Blacksmith	1.35	9.23	9	2.06	8.24	19	1.42	5.65	14	1.24	4.52	23	5.48	12.03	35
Blue rockfish	2.26	6.07	27	1.46	4.37	27	0.62	1.93	20	0.06	0.37	3	0.16	0.56	10
Ca. Sheephead	0.12	0.27	8	0.28	0.60	21	0.18	0.53	13	0.21	0.52	17	0.18	0.46	13
Canary/Vermillion complex															
Copper rockfish	0.08	0.16	3	0.02	0.21	1	0.05	0.22	5	0.05	0.22	5	0.05	0.23	5
Gopher rockfish	0.08	0.11	1	0.01	0.10	1	0.04	0.20	4				0.02	0.15	2
Gopher/Copper complex	0.01	0.27	8	0.01	0.10	1									
Kelp bass				0.01	0.10	1				0.20	0.60	15	0.08	0.27	7
Kelp greenling															
Kelp rockfish				0.01	0.10	1				0.01	0.10	1			
Lingcod	0.04	0.55	9	0.03	0.18	3	0.05	0.22	5				0.04	0.21	4
Oceanwhite				0.01	0.10	1			0	0.02	0.14	2			
Pile perch	0.05	0.19	4	0.06	0.29	5	0.17	1.16	4				0.01	0.10	1
Sebastes	0.13	0.58	9				0.59	1.09	31	0.13	0.39	12	0.09	0.35	6
Senorita	0.71	0.41	10	1.74	9.88	10	0.19	1.45	4	0.01	0.10	1			
Treefish	0.03	2.80	13				0.12	0.32	11	0.01	0.10	1	0.04	0.21	4
Unidentified perch	0.82	0.36	10	0.43	0.99	21	0.45	1.31	18	0.26	1.57	7	0.68	2.10	18
Unidentified rockfish	0.14	0.83	32	0.05	0.23	5	0.14	0.48	9	0.13	0.84	5	0.08	0.31	6
Vermillion rockfish	0.45	3.12	24	0.14	0.52	7	0.72	1.22	41	0.15	0.54	10	0.18	0.49	12
Yellowtail/Olive complex	0.15	0.27	4	0.05	0.23	5	0.24	0.63	18				0.02	0.15	2
<b>Average</b>	<b>0.43</b>	<b>1.68</b>	<b>11</b>	<b>0.38</b>	<b>1.55</b>	<b>8</b>	<b>0.36</b>	<b>1.17</b>	<b>13</b>	<b>0.19</b>	<b>0.77</b>	<b>8</b>	<b>0.51</b>	<b>1.26</b>	<b>9</b>

Appendix 5. Percentage of soft only substrate determined at sea and during post-processing by line number from ten northern Channel Islands sites sampled in 2007. Beginning line numbers are listed for one to four zones per site.

Harris Point SMR			Castle Rock			Carrington Pt. SMR			Rodes Reef			Cluster Point		
Line	% Soft Only		Line	% Soft Only		Line	% Soft Only		Line	% Soft Only		Line	% Soft Only	
	At Sea	Post		At Sea	Post		At Sea	Post		At Sea	Post		At Sea	Post
20	50	36	220	8	4	440	55	44	100	20	13	20	18	12
560	75	67	240	0	12	620	8	18	220	21	18	80	21	28
600	73	70	990	0	0	740	36	59	280	27	31	260	0	0
620	64	57	Zone 2			760	43	41	320	17	19	420	8	10
760	73	71	Zone 2			820	64	50	360	20	34	570	20	21
840	60	51	1420	0	1	880	57	67	420	27	27	610	17	16
940	42	40	1700	0	0	Zone 2			Zone 2			750	33	34
1000	27	31	1920	0	2	Zone 2			Zone 2			770	50	52
1060	33	31	1960	0	1	1460	20	43	460	33	28	830	46	42
Zone 2			2360	18	17	1660	50	55	750	47	58	Zone 2		
Zone 2			Zone 2			1680	27	35	790	36	66	Zone 2		
1270	73	24	Zone 2			1880	50	39	810	57	53	1130	50	50
1540	9	18	Zone 2			1900	33	54	850	53	51	1330	50	50
1940	27	27	Zone 2			2100	27	29	890	63	61	Zone 2		
1980	31	34	Zone 2			2240	50	51	Zone 2			Zone 2		

Appendix 5 continued.

South Pt. SMR			Gull Island SMR			East Point			Anacapa Island SMCA			Anacapa Island SMR		
Line	% Soft Only		Line	% Soft Only		Line	% Soft Only		Line	% Soft Only		Line	% Soft Only	
	At Sea	Post		At Sea	Post		At Sea	Post		At Sea	Post		At Sea	Post
20	38	37	560	50	55	390	92	93	70	60	60	0	55	57
80	22	20	590	47	56	450	64	71	90	64	60	30	64	42
140	32	31	630	57	71	510	54	79	100	58	56	40	45	38
160	32	30	640	67	67	630	45	72	140	54	37	70	55	30
260	75	69	650	75	61	760	50	61	170	23	17	80	45	40
280	40	78	670	73	64	820	60	68	200	36	24	110	38	12
490	50	72	680	69	72	Zone 2			250	54	44	150	50	30
Zone 2			720	82	68	Zone 2			270	47	43	170	27	16
Zone 2			870	77	64	1290	42	56	320	50	49	Zone 2		
630	73	64	890	75	70	1510	67	62	330	64	46	820	78	67
670	60	59	940	71	70	1750	33	33	340	60	51	830	75	74
790	25	58	950	73	66	1770	54	60	Zone 2			840	54	63
830	13	74	960	69	64	2080	36	37	550	50	33	850	80	68
910	80	83	990	73	69	2160	80	70	650	42	38	860	67	57
1030	54	52	1000	64	60	Zone 3						910	50	45
1050	64	66	1010	64	60	Zone 3						930	62	45
1110	60	47	1040	65	54	2790	18	28				940	85	75
			1060	54	54	2830	22	34				960	77	75
			1080	62	60	2990	40	42						
			1090	79	66	3030	53	49						
			1120	71	68	Zone 4								
						3370	30	64						
						3410	71	63						

Appendix 6. ROV dive data for Harris Point SMR surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>SMI-1</b>													
8/25/2007	1	370	20	22:01:36	22:13:20	193319.35	3773041.00	192922.04	3773333.51	0.7	2.8	25.5	32.0	28.6
			560	21:32:48	21:44:06	193257.57	3773752.35	193655.64	3773466.16	0.7	3.1	32.6	41.0	38.1
			600	21:19:05	21:29:32	193669.46	3773500.51	193280.10	3773790.56	0.8	2.8	34.6	42.6	38.4
			620	21:04:54	21:15:47	193291.50	3773796.61	193315.40	3773789.12	0.7	3.1	34.9	41.1	38.3
			760	20:45:00	20:55:42	192983.04	3774206.96	193321.07	3773947.65	0.8	3.4	34.3	43.0	38.7
			840	20:31:26	20:40:11	193394.20	3774003.77	193055.73	3774263.29	0.8	3.6	35.9	45.1	40.1
	2	369	940	20:11:56	20:22:47	193080.83	3774349.57	193133.32	3774321.53	0.7	3.8	29.8	45.9	41.1
			1000	19:58:56	20:08:44	193511.06	3774120.64	193123.36	3774406.11	0.8	3.1	40.8	48.9	45.0
			1060	19:42:47	19:54:01	193157.81	3774451.07	193549.31	3774168.51	0.7	3.2	40.1	50.0	46.5
			1270	19:17:23	19:22:35	193307.09	3774607.76	193124.28	3774751.39	0.8	3.6	40.3	46.8	43.7
			1540	18:55:11	19:05:17	193084.82	3775105.68	193465.99	3774818.62	0.8	3.5	39.5	54.4	46.5
			1940	18:31:41	18:41:47	192914.38	3775722.86	193314.66	3775428.78	0.8	3.7	36.5	55.5	50.4
			1980	18:16:19	18:28:43	193321.47	3775475.98	192942.71	3775759.27	0.7	3.1	43.6	56.4	52.3

Appendix 6. ROV dive data for Castle Rock surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>SMI-2</b>													
8/25/2007	1	368	220	16:59:41	17:11:53	182419.99	3776147.55	182895.78	3776266.01	0.7	3.7	24.2	41.3	33.2
			240	16:45:23	16:56:00	182898.27	3776287.65	182409.95	3776165.70	0.8	3.9	27.9	42.6	34.1
			990	16:16:23	16:27:02	182728.84	3777006.53	183200.80	3777135.97	0.8	3.2	39.5	47.6	43.7
	2		1420	15:55:06	16:05:50	182136.67	3777312.84	182613.46	3777434.39	0.8	3.0	42.7	49.0	46.1
			1700	15:37:05	15:47:11	182539.27	3777697.72	182400.73	3777683.99	0.8	3.7	45.7	51.2	48.4
			1920	15:19:02	15:29:14	182019.69	3777786.29	182486.00	3777914.50	0.8	3.6	47.4	54.5	50.4
			1960	15:04:53	15:15:53	182471.17	3777943.17	182449.83	3777945.41	0.7	3.5	48.6	53.4	50.4
			2360	14:45:02	14:55:35	181909.33	3778227.33	182351.16	3778328.13	0.8	3.4	51.8	58.2	54.6



Appendix 6. ROV dive data for Carrington Point SMR surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>SRI-2</b>													
8/24/2007	1	367	440	23:13:21	23:23:41	216750.97	3771892.05	217184.25	3772073.57	0.8	3.5	24.0	29.6	26.8
			620	22:53:29	23:05:05	217114.74	3772238.70	216892.77	3772154.95	0.7	2.8	17.6	31.0	23.5
			740	22:36:53	22:47:53	216615.05	3772156.88	216701.34	3772197.92	0.8	3.8	19.8	31.6	25.7
			760	22:21:39	22:34:29	217045.60	3772370.92	217032.19	3772372.18	0.6	3.2	20.1	32.4	26.3
			820	22:03:21	22:16:47	216589.16	3772242.53	216854.21	3772351.16	0.6	3.1	21.0	31.3	27.0
			880	21:45:59	21:58:47	217009.37	3772481.64	216984.19	3772481.18	0.6	2.9	21.4	33.0	27.4
8/23/2007	2	364	1460	22:24:31	22:34:31	216314.52	3772812.96	216757.68	3773004.91	0.8	3.1	24.2	32.8	28.5
			1660	22:09:59	22:19:47	216669.50	3773187.45	216582.43	3773148.05	0.8	2.9	25.0	34.5	30.5
			1680	21:56:31	22:06:31	216231.20	3773007.46	216661.17	3773204.16	0.8	3.4	26.1	34.7	30.3
			1880	21:35:19	21:44:55	216573.70	3773378.57	216118.58	3773191.29	0.9	3.2	24.9	35.3	31.1
			1900	21:21:01	21:32:19	216121.84	3773210.07	216481.70	3773361.19	0.7	3.1	25.7	34.4	30.7
			2100	21:01:47	21:16:06	216432.36	3773569.27	216408.87	3773557.17	0.5	3.3	0.0	38.6	34.5
			2240	20:40:05	20:53:46	216010.63	3773525.08	216088.40	3773558.60	0.6	3.2	32.7	40.0	36.9

Appendix 6. ROV dive data for Rodes Reef surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)	
	<b>SRI-3</b>														
8/23/2007	1	363	100	18:28:01	18:42:59	210745.10	3771693.43	211253.44	3771737.76	0.6	3.4	19.6	24.6	22.6	
			220	18:04:11	18:17:59	211233.41	3771852.19	210727.31	3771815.14	0.6	3.3	18.5	25.3	22.9	
			280	17:46:29	18:00:31	210736.98	3771875.37	211234.15	3771905.88	0.6	3.4	19.8	25.1	23.2	
			320	17:26:49	17:42:01	211227.18	3771953.08	210724.96	3771919.13	0.6	3.1	19.8	26.0	23.1	
			360	17:09:19	17:23:43	210727.37	3771952.29	210780.94	3771962.46	0.6	2.9	21.4	25.9	23.7	
				420	16:50:49	17:05:35	211211.50	3772052.89	210722.27	3772013.69	0.6	3.0	21.2	27.5	24.2
		2	362	460	16:34:10	16:45:01	210726.56	3772054.66	211218.10	3772094.21	0.8	2.8	21.4	27.9	24.4
	750			16:10:49	16:25:31	210880.94	3772346.16	210707.31	3772350.15	0.6	2.6	26.9	38.6	32.8	
	790			15:53:49	16:06:46	210706.38	3772384.09	210737.12	3772382.00	0.6	2.7	26.0	39.8	33.6	
	810			15:37:22	15:50:52	210941.91	3772420.17	210691.69	3772407.26	0.6	2.6	25.1	39.8	33.9	
850	15:20:07			15:34:25	210793.15	3772447.06	210735.48	3772453.00	0.6	2.7	28.3	42.0	35.5		
			890	15:00:19	15:16:25	211101.16	3772518.81	210978.12	3772499.96	0.5	2.4	32.5	45.2	37.4	

Appendix 6. ROV dive data for Cluster Point surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>SRI-7</b>													
8/26/2007	1	372	20	17:59:08	18:09:20	205317.67	3757546.52	205097.32	3757670.65	0.8	3.5	20.0	27.4	24.2
			80	17:41:44	17:55:32	205073.96	3757614.53	205097.67	3757605.03	0.6	2.9	21.4	28.2	25.0
			260	17:21:59	17:34:20	205100.85	3757399.55	205039.13	3757441.26	0.7	3.4	23.3	31.2	27.2
			420	17:04:56	17:15:48	204891.36	3757331.75	205336.78	3757078.19	0.8	4.4	22.6	32.8	28.6
		371	570	16:41:20	16:55:25	205265.49	3756953.50	204812.50	3757207.07	0.6	3.5	30.1	38.4	34.8
			610	16:27:20	16:37:55	204797.45	3757175.09	205155.20	3756965.09	0.8	3.2	30.7	40.5	35.9
			750	16:11:13	16:22:31	205180.61	3756796.99	204717.08	3757053.43	0.8	3.5	33.7	42.0	39.2
			770	15:54:23	16:04:47	204722.07	3757040.17	205147.86	3756747.78	0.9	3.1	36.3	43.4	40.3
	830		15:38:07	15:50:50	205134.33	3756728.94	204675.08	3756985.23	0.7	3.4	39.6	45.8	41.9	
	2	1130	15:16:59	15:26:17	204279.31	3756875.61	204723.56	3756618.28	0.9	4.0	43.6	52.6	49.1	
		1330	14:59:05	15:10:17	204612.03	3756455.27	204192.42	3756693.54	0.7	3.8	47.4	58.4	54.6	

Appendix 6. ROV dive data for South Point SMR surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>SRI-8</b>													
8/24/2007	1	366	20	19:01:05	19:13:53	212134.21	3754344.99	212379.91	3754165.17	0.5	3.2	18.1	25.2	21.7
			80	18:38:16	18:56:20	212494.98	3754014.09	212209.79	3754215.07	0.5	3.3	18.8	32.3	24.8
			140	18:14:41	18:32:52	212072.46	3754237.19	212420.88	3754000.21	0.5	3.8	22.0	36.7	28.0
			160	17:53:38	18:10:11	212456.54	3753950.97	212097.57	3754202.24	0.5	3.8	17.8	36.8	27.2
			260	17:27:35	17:43:26	211999.82	3754141.84	212403.92	3753867.58	0.5	3.1	29.1	40.8	34.8
			280	17:15:17	17:24:53	212384.87	3753853.59	211985.29	3754139.21	0.8	2.3	0.0	42.0	35.8
			490	16:50:08	17:03:40	211778.90	3754027.54	212173.99	3753740.89	0.6	3.0	34.4	46.4	42.1
	2	365	630	16:35:02	16:45:04	212097.81	3753631.83	211992.46	3753696.43	0.8	3.5	38.3	51.6	44.7
			670	16:14:11	16:28:53	211670.40	3753883.57	212051.67	3753611.66	0.6	3.6	39.6	53.7	46.5
			790	15:58:35	16:09:44	212005.56	3753510.18	211984.57	3753526.28	0.8	3.3	39.9	53.5	48.4
			830	15:40:29	15:54:59	211579.19	3753751.21	211881.16	3753543.80	0.6	3.2	47.2	53.7	50.5
			910	15:26:50	15:36:51	211927.06	3753403.79	211623.30	3753626.34	0.8	3.0	48.8	56.2	52.4
			1030	15:09:29	15:22:23	211460.41	3753582.60	211874.75	3753301.40	0.7	3.2	54.5	64.7	58.0
			1050	14:56:59	15:06:41	211841.89	3753273.72	211814.64	3753313.35	0.9	3.3	55.9	66.6	59.1
1110	14:38:41	14:53:39	211421.95	3753512.04	211631.05	3753361.35	0.6	3.8	58.5	70.7	64.5			

Appendix 6. ROV dive data for East Point surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)	
	<b>SRI-6</b>														
8/27/2007	1	373	390	23:07:05	23:17:53	225145.06	3758332.52	225167.53	3758344.03	0.8	2.4	21.9	27.8	24.7	
			450	22:46:19	22:59:17	224887.24	3758197.71	224916.99	3758206.56	0.6	2.3	21.4	27.1	25.2	
			510	22:29:59	22:41:46	225365.36	3758277.88	225329.55	3758278.01	0.7	3.0	15.3	27.5	24.2	
			630	22:14:01	22:24:11	224929.91	3758024.19	225410.92	3758165.43	0.8	3.2	22.7	26.1	24.5	
			760	21:56:19	22:08:01	225396.76	3758026.70	225378.25	3758017.53	0.7	3.2	18.9	27.0	24.5	
			820	21:41:01	21:50:25	224991.56	3757846.66	225451.41	3757978.62	0.9	3.0	22.1	26.9	25.4	
8/29/2007	2	378	1290	18:27:03	18:38:39	225854.82	3757625.54	225867.68	3757624.48	0.7	3.2	20.5	31.9	27.1	
			1510	18:01:52	18:13:22	225468.04	3757265.11	225945.45	3757417.49	0.8	3.3	25.0	31.6	28.7	
			1750	17:41:10	17:52:40	226004.24	3757184.50	225535.63	3757032.42	0.7	3.1	19.8	31.4	27.0	
			1770	17:24:34	17:36:36	225538.59	3757014.49	225900.45	3757126.05	0.7	3.3	15.5	31.8	26.0	
			2080	17:02:10	17:12:22	226102.58	3756862.46	225668.63	3756729.13	0.8	3.1	24.1	32.6	28.6	
				2160	16:42:54	16:57:42	225659.08	3756639.17	225812.71	3756688.43	0.6	3.0	22.4	34.4	30.1
		3	377	2790	16:08:16	16:19:18	226049.29	3756107.32	225844.23	3756037.68	0.7	3.4	19.0	31.6	23.5
	2830			15:47:39	16:04:40	225599.56	3755922.72	225892.34	3756009.43	0.5	3.9	16.5	32.5	24.0	
	2990			15:30:24	15:39:36	226099.09	3755917.93	225637.02	3755769.38	0.9	3.7	20.2	37.2	26.7	
				3030	15:11:00	15:27:06	225655.52	3755729.18	226135.70	3755883.50	0.5	3.4	21.8	39.5	30.9
		4		3370	14:48:10	14:59:39	226467.07	3755632.92	226177.86	3755536.52	0.7	2.8	37.3	52.1	43.5
					3410	14:28:24	14:44:36	226001.73	3755441.07	226111.66	3755463.67	0.5	3.5	37.9	53.1

Appendix 6. ROV dive data for Gull Island SMR surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>SCI-2</b>													
8/28/2007	1	375	720	18:54:44	19:04:44	239797.17	3759339.32	239310.24	3759429.83	0.8	3.3	34.6	55.5	45.7
			870	18:33:34	18:45:41	239267.53	3759291.38	239536.92	3759228.54	0.7	2.9	42.3	57.3	48.6
			890	18:18:47	18:30:17	239758.97	3759168.57	239538.67	3759210.70	0.7	2.8	42.2	62.0	49.5
			940	18:01:26	18:15:02	239252.07	3759221.32	239285.08	3759214.45	0.6	3.0	46.4	60.8	51.2
			950	17:44:20	17:58:23	239743.22	3759111.29	239266.88	3759209.50	0.6	2.8	46.2	61.2	51.3
			960	17:25:59	17:41:47	239252.56	3759198.63	239733.65	3759099.54	0.5	2.7	46.2	61.9	52.5
		990	17:06:14	17:20:26	239721.45	3759076.28	239245.22	3759174.67	0.6	3.1	48.1	62.6	53.4	
		376	560	20:50:27	21:05:42	239335.12	3759582.70	239344.87	3759574.32	0.6	2.2	30.6	49.3	39.2
			590	20:29:51	20:47:42	239815.30	3759452.08	239443.29	3759534.21	0.6	2.8	30.7	51.3	37.4
			630	20:13:09	20:24:33	239380.64	3759507.06	239811.15	3759416.04	0.7	3.2	33.7	50.8	41.9
			640	19:55:54	20:06:56	239814.87	3759406.23	239606.27	3759454.76	0.8	2.7	36.6	52.3	45.2
			650	19:41:09	19:52:47	239311.35	3759500.33	239590.12	3759438.36	0.7	3.1	32.0	54.1	42.9
			670	19:27:27	19:38:23	239804.32	3759384.65	239659.85	3759414.41	0.8	3.0	35.4	55.2	43.4
		374	680	19:11:21	19:24:05	239310.08	3759468.28	239310.01	3759468.32	0.7	3.2	33.3	56.1	44.2
			1000	16:46:36	16:59:40	239251.58	3759154.70	239507.02	3759110.30	0.6	3.4	48.1	62.8	53.8
			1010	16:30:09	16:43:00	239717.94	3759053.93	239341.89	3759130.99	0.6	3.2	47.9	62.3	54.4
			1040	16:12:08	16:25:16	239231.05	3759118.14	239615.93	3759040.19	0.6	3.7	47.9	63.4	56.1
			1060	15:56:32	16:08:45	239714.12	3759005.34	239294.35	3759091.79	0.7	3.3	51.9	63.2	58.0
1080	15:40:45		15:53:27	239225.98	3759089.77	239713.34	3758984.12	0.7	3.9	56.4	64.5	60.3		
1090	15:23:33	15:37:44	239717.37	3758973.18	239540.82	3759008.19	0.6	3.1	56.6	65.5	61.0			
1120	15:06:41	15:20:35	239223.94	3759041.46	239487.69	3758988.86	0.6	3.7	55.4	66.8	62.6			

Appendix 6. ROV dive data for Anacapa Island SMR surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	<b>AI-3</b>													
8/30/2007	1	381	0	19:51:14	20:01:59	281433.15	3766896.93	281251.20	3766821.94	0.8	2.2	16.8	25.0	21.9
			30	19:37:41	19:48:32	280933.34	3766728.11	281315.26	3766884.88	0.8	2.3	19.3	25.7	22.9
			40	19:24:32	19:35:02	281415.64	3766931.36	280928.20	3766736.13	0.9	2.2	20.0	25.5	23.1
			70	19:09:29	19:21:29	280908.37	3766761.22	281074.95	3766825.32	0.7	2.0	21.0	26.6	24.1
			80	18:55:41	19:06:20	281399.42	3766973.39	281046.16	3766821.52	0.8	2.8	20.7	28.1	24.2
			110	18:39:11	18:51:29	280895.55	3766804.32	281401.43	3766999.59	0.7	3.0	20.4	27.7	24.9
			150	18:22:14	18:36:01	281376.86	3767037.49	280974.29	3766873.20	0.7	2.7	22.9	29.8	26.6
			170	18:04:20	18:18:37	280875.21	3766862.44	281301.98	3767032.65	0.7	3.0	23.3	30.5	27.3
8/31/2007	2	382	820	16:34:51	16:43:48	281142.70	3767647.20	280656.20	3767452.56	1.0	2.1	55.9	63.0	58.5
			830	16:21:06	16:32:45	280640.75	3767465.47	281087.80	3767645.14	0.8	2.6	55.6	62.4	58.8
			840	16:45:55	16:58:13	280639.95	3767473.69	280959.16	3767596.77	0.8	2.6	55.9	64.0	59.3
			850	16:08:37	16:18:15	281125.90	3767683.84	280639.80	3767490.99	0.9	2.4	56.3	63.7	59.2
			860	15:55:06	16:06:55	280629.96	3767499.37	281126.34	3767690.56	0.8	2.3	55.4	63.8	59.1
			910	15:41:12	15:51:09	281112.49	3767735.16	280908.58	3767660.10	0.9	3.2	54.5	63.6	59.3
			930	15:26:37	15:39:00	280605.45	3767567.95	281067.86	3767742.52	0.7	2.8	56.6	64.5	60.5
			940	15:12:33	15:24:57	281090.56	3767764.93	280707.80	3767617.45	0.7	2.9	57.3	66.7	62.0
			960	14:58:09	15:10:21	280611.84	3767595.44	281039.23	3767764.15	0.7	2.4	58.0	67.4	62.9

Appendix 6. ROV dive data for Anacapa Island SMCA surveyed in 2007.

Date	Zone	Dive	Line Number	Beginning time (GMT)	Ending time (GMT)	Begin X	Begin Y	End X	End Y	Avg velocity (m/s)	Avg Width (m)	Min depth (m)	Max depth (m)	Avg depth (m)
	AI-1													
8/30/2007	1	380	70	17:16:53	17:26:14	274424.61	3766654.71	274496.17	3766678.18	0.9	2.7	11.5	25.2	20.5
			90	17:01:41	17:12:18	274885.88	3766845.06	274404.59	3766674.47	0.8	2.5	14.3	26.3	21.3
			100	16:47:56	16:59:14	274409.16	3766688.47	274620.25	3766767.39	0.8	2.4	14.9	28.0	22.2
			140	16:32:24	16:44:32	274856.22	3766892.44	274479.03	3766749.89	0.7	2.6	16.2	30.2	23.9
			170	16:16:05	16:27:56	274384.00	3766757.75	274866.05	3766918.51	0.7	3.2	19.2	31.6	24.9
			200	15:59:05	16:12:42	274848.90	3766946.08	274622.78	3766876.62	0.6	3.5	22.4	32.3	28.4
			250	15:38:23	15:50:26	274102.24	3766736.82	274588.34	3766902.33	0.7	2.8	26.8	38.7	34.0
	2	379	270	15:17:17	15:31:37	274564.50	3766929.41	274532.24	3766910.04	0.6	2.4	27.6	39.2	34.8
			320	15:00:32	15:13:44	274070.59	3766797.27	274554.84	3766963.94	0.7	2.6	32.2	41.4	37.0
			330	14:44:20	14:57:38	274549.24	3766985.44	274371.46	3766913.19	0.6	2.7	32.8	41.9	37.5
			340	14:32:04	14:41:19	274082.31	3766823.04	274550.80	3766988.13	0.9	2.9	33.8	41.4	38.3
			550	14:12:43	14:24:11	274468.17	3767186.50	274320.19	3767132.58	0.7	3.0	37.2	44.2	41.1
			650	13:56:25	14:08:02	273968.20	3767110.92	274058.31	3767136.15	0.7	3.5	37.8	50.0	45.1



Appendix 7. ROV substrate and habitat summary data for Harris Point SMR surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SMI-1</b>											
	20	497.7	64	0	0	97	0	3	60	36	0
	560	499.0	33	11	1	88	2	12	21	67	0
	600	493.1	30	2	7	84	1	14	16	70	0
	620	483.6	43	7	0	82	0	18	25	57	0
	760	494.9	29	0	0	91	3	9	20	71	0
	840	432.5	49	16	8	87	4	13	37	51	0
	940	490.7	60	0	16	72	5	24	36	40	0
	1000	493.6	69	10	11	71	3	29	40	31	0
	1060	492.6	69	0	0	78	4	22	47	31	0
	1270	236.9	74	16	8	49	0	51	25	24	0
	1540	482.9	82	9	34	47	3	44	38	18	0
	1940	502.6	73	21	3	61	3	39	34	27	0
	1980	489.1	66	0	0	73	5	27	39	34	0

Appendix 7. ROV substrate and habitat summary data for Castle Rock surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SMI-2</b>											
	220	517.4	94	0	4	38	8	59	35	4	2
	240	513.0	87	24	6	54	4	46	41	12	0
	990	495.9	100	20	19	20	2	72	28	0	0
	1420	499.8	99	38	6	57	0	43	56	1	0
	1700	494.3	100	29	37	10	0	57	43	0	0
	1920	492.0	98	42	20	24	1	68	29	2	0
	1960	490.1	99	37	35	14	0	59	40	1	0
	2360	494.6	83	29	12	64	3	36	46	17	0

## Appendix 7. ROV substrate and habitat summary data for Carrington Point SMR surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SRI-2</b>											
	440	499.3	56	0	0	100	0	0	56	44	0
	620	499.4	82	8	27	69	1	31	51	18	0
	740	527.7	38	13	53	82	5	17	24	59	0
	760	487.0	59	0	17	80	1	20	39	41	0
	820	484.0	49	0	0	73	0	27	23	50	0
	880	487.8	31	5	32	93	0	7	26	67	0
	1460	494.6	52	14	51	84	0	15	42	43	0
	1660	495.0	44	2	28	96	3	3	41	55	1
	1680	483.1	65	0	15	75	3	25	40	35	0
	1880	509.4	60	31	19	89	1	10	51	39	0
	1900	487.2	44	18	37	86	3	12	34	54	0
	2100	469.4	70	12	7	77	3	22	48	29	1
	2240	465.9	49	0	0	79	4	21	28	51	0

## Appendix 7. ROV substrate and habitat summary data for Rodes Reef surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SRI-3</b>											
	100	519.3	87	1	0	59	0	41	46	13	0
	220	513.2	82	0	0	68	0	32	50	18	0
	280	501.6	69	0	0	91	0	9	59	31	0
	320	510.2	81	0	0	90	0	10	71	19	0
	360	505.9	66	0	0	92	0	8	58	34	0
	420	495.0	73	4	0	86	0	14	60	27	0
	460	496.7	72	1	12	76	0	24	48	28	0
	750	503.4	42	0	0	98	2	2	40	58	0
	790	501.4	34	0	6	90	0	10	24	66	0
	810	507.3	47	5	0	82	0	18	29	53	0
	850	494.9	49	7	22	90	0	9	41	51	0
	890	489.5	39	0	0	89	0	11	29	61	0

Appendix 7. ROV substrate and habitat summary data for Cluster Point surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SRI-7</b>											
	20	507.6	88	0	0	65	3	35	53	12	0
	80	525.1	72	0	0	59	0	41	31	28	0
	260	519.1	100	0	0	62	3	38	62	0	0
	420	526.2	90	0	27	53	9	44	46	10	0
	570	527.6	79	9	0	61	2	39	39	21	0
	610	499.1	84	1	6	75	0	24	60	16	0
	750	536.4	66	1	5	90	4	10	55	34	0
	770	541.2	40	0	19	79	10	12	28	52	9
	830	535.2	58	10	1	78	1	22	37	42	0
	1130	531.7	50	2	9	78	4	20	31	50	0
	1330	492.0	50	7	5	89	5	11	38	50	0

## Appendix 7. ROV substrate and habitat summary data for South Point SMR surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SRI-8</b>											
	20	391.9	63	0	0	76	2	24	39	37	0
	80	522.8	80	0	3	65	5	34	46	20	1
	140	565.9	66	0	4	62	32	35	31	31	3
	160	525.3	70	0	0	53	20	47	24	30	0
	260	516.7	31	0	2	94	2	6	25	69	0
	280	497.1	22	0	0	96	0	4	18	78	0
	490	499.7	28	0	4	98	2	2	25	72	0
	630	495.3	36	6	1	89	1	11	25	64	0
	670	520.3	41	1	1	90	3	10	31	59	0
	790	520.6	42	2	1	89	2	11	31	58	0
	830	507.2	26	0	0	95	0	5	21	74	0
	910	506.8	17	0	0	94	0	6	11	83	0
	1030	513.5	48	0	2	90	1	10	37	52	0
	1050	502.9	34	0	0	97	2	3	31	66	0
	1110	511.4	53	0	0	81	4	19	34	47	0

## Appendix 7. ROV substrate and habitat summary data for East Point surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SRI-6</b>											
	390	510.7	7	0	10	100	0	0	7	93	0
	450	491.5	29	4	1	91	0	9	21	71	0
	510	500.4	21	0	9	90	0	10	11	79	0
	630	503.8	28	0	4	97	0	3	24	72	0
	760	463.9	39	0	6	83	2	17	22	61	0
	820	482.8	31	1	0	88	0	12	20	68	0
	1290	519.9	44	0	0	71	1	29	15	56	0
	1510	519.1	36	9	2	93	2	7	32	62	0
	1750	510.9	67	0	9	77	1	23	44	33	0
	1770	512.4	40	0	0	70	2	30	10	60	0
	2080	518.5	63	0	0	82	0	18	44	37	0
	2160	506.8	30	13	15	92	5	8	22	70	0
	2790	496.0	72	0	0	56	5	44	28	28	0
	2830	547.9	66	0	0	61	8	39	27	34	0
	2990	489.3	58	0	7	85	0	15	43	42	0
	3030	535.9	50	0	0	75	4	24	26	49	1
	3370	515.8	35	0	3	93	0	6	30	64	1
	3410	521.8	37	0	0	87	4	13	24	63	0

## Appendix 7. ROV substrate and habitat summary data for Gull Island SMR surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>SCI-2</b>											
	560	520.3	45	0	0	95	0	4	41	55	1
	590	634.4	36	0	6	82	8	10	26	56	8
	630	451.6	29	8	0	95	1	5	25	71	0
	640	507.9	31	1	7	92	0	5	26	67	2
	650	521.4	38	0	0	90	3	8	30	61	1
	670	515.1	36	0	9	95	1	5	31	64	0
	680	515.5	28	0	1	91	0	9	19	72	0
	720	504.0	32	0	5	85	0	15	18	68	0
	870	478.0	36	6	0	96	0	4	32	64	0
	890	491.3	30	0	3	97	2	3	26	70	0
	940	517.9	30	8	0	95	0	5	26	70	0
	950	499.4	34	2	6	91	0	8	26	66	0
	960	506.9	36	0	3	94	1	6	29	64	0
	990	496.0	31	0	7	92	3	8	22	69	0
	1000	494.3	35	13	2	89	1	11	29	60	0
	1010	499.6	40	3	9	87	1	12	28	60	0
	1040	508.1	46	3	5	84	5	16	30	54	0
	1060	506.8	46	2	2	82	1	18	28	54	0
	1080	507.2	40	12	0	82	7	18	22	60	0
	1090	516.3	34	6	7	89	0	10	25	66	0
	1120	509.6	32	4	2	93	2	7	25	68	0



Appendix 7. ROV substrate and habitat summary data for Anacapa Island SMR surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>AI-3</b>											
	0	541.3	43	0	0	79	0	21	22	57	0
	30	551.4	58	1	10	75	0	25	33	42	0
	40	543.2	62	0	0	83	0	17	45	38	0
	70	542.3	70	22	0	69	0	31	39	30	0
	80	543.2	60	1	0	72	0	28	32	40	0
	110	546.9	88	10	6	74	0	26	62	12	0
	150	544.3	70	0	0	71	0	29	42	30	1
	170	563.9	80	51	6	63	0	36	48	16	0
	820	545.5	33	11	3	96	0	4	29	67	0
	830	543.3	26	4	1	98	8	2	25	74	0
	840	579.0	37	35	1	98	6	2	35	63	0
	850	529.8	32	0	11	100	0	0	32	68	0
	860	546.0	42	33	2	96	0	4	38	57	0
	910	522.5	55	26	3	92	5	8	47	45	0
	930	547.0	55	10	0	93	0	7	48	45	0
	940	538.1	25	0	0	99	1	1	25	75	0
	960	526.0	24	9	0	99	2	1	24	75	0

Appendix 7. ROV substrate and habitat summary data for **Anacapa Island SMCA** surveyed in 2007.

Site	Line Number	Length (m)	Percentage of substrate on each line					Percentage of habitat on each line			
			Rock	Boulder	Cobble	Sand	Backsides	Hard	Mixed	Soft	Off Transect
<b>AI-1</b>											
	70	521.4	40	1	0	83	0	17	23	60	0
	90	518.9	40	4	7	98	0	2	37	60	0
	100	512.4	44	0	0	85	1	15	29	56	0
	140	498.8	63	16	0	84	1	16	48	37	0
	170	512.2	83	5	4	42	1	56	27	17	0
	200	526.8	75	4	0	62	2	37	38	24	0
	250	523.0	55	0	0	86	1	13	42	44	1
	270	514.9	57	11	13	73	0	27	31	43	0
	320	519.6	50	4	5	80	1	20	30	49	0
	330	523.1	54	2	6	85	0	15	39	46	0
	340	502.1	49	0	0	92	0	8	41	51	0
	550	510.0	65	16	0	71	0	29	38	33	0
	650	514.1	62	1	4	63	0	37	24	38	0