

Appendix D: Invertebrate Population Attributes

Appendix D-1. Percent of area of megabenthic invertebrate species by subpopulation on the southern California Shelf and upper slope at depths of 2-484 m, July-October 2008.	D1-1
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Appendix D-1. Percent of area of megabenthic invertebrate species by subpopulation on the southern California Shelf and upper slope at depths of 2-484 m, July-October 2008

Species*	Percent of Area								
	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Pleurobranchaea californica</i>	64	51	35	-	10	52	78	67	54
<i>Strongylocentrotus fragilis</i>	43	45	38	-	-	3	87	76	43
<i>Astropecten verrilli</i>	23	56	54	-	71	85	35	3	40
<i>Octopus californicus</i>	53	23	26	-	-	-	22	79	38
<i>Luidia foliolata</i>	28	48	39	-	6	73	57	21	37
<i>Brissopsis pacifica</i>	47	21	31	-	-	3	48	67	35
<i>Brisaster townsendi</i>	41	21	20	-	-	-	13	64	30
<i>Sicyonia ingentis</i>	21	25	40	16	3	61	78	3	27
<i>Lytechinus pictus</i>	14	37	35	8	29	67	22	-	26
<i>Octopus rubescens</i>	27	11	39	-	23	45	57	6	25
<i>Philine auriformis</i>	27	35	4	16	16	39	22	18	24
<i>Myxoderma platyacanthum</i>	33	13	6	-	-	-	-	45	21
<i>Parastichopus californicus</i>	10	26	30	-	3	61	13	-	19
<i>Spirontocaris sica</i>	21	21	12	-	-	-	-	42	19
<i>Neocrangon zacaе</i>	18	22	17	-	-	6	57	27	19
<i>Dromalia alexandri</i>	9	26	30	-	-	-	13	39	19
<i>Spirontocaris holmesi</i>	29	14	-	-	-	-	17	36	18
Goniasteridae	39	-	-	-	-	-	-	39	18
<i>Pannychia moseleyi</i>	27	17	-	-	-	-	-	39	18
<i>Spatangus californicus</i>	14	13	31	-	-	3	35	30	18
<i>Ophiura luetkenii</i>	12	22	22	-	3	48	17	3	18
<i>Acanthoptilum</i> sp	11	22	24	7	3	52	22	-	18
<i>Neocrangon resima</i>	18	19	10	-	-	-	35	30	17
<i>Thesea</i> sp B	9	17	26	-	-	48	9	-	15
<i>Ophiothrix spiculata</i>	6	18	24	11	16	36	9	-	14
<i>Aphrodita japonica</i>	29	-	-	-	-	-	9	27	13
<i>Hamatoscalpellum californicum</i>	10	22	4	-	19	33	-	-	13
<i>Pandalus platyceros</i>	18	9	6	-	10	6	22	15	12
<i>Ophiopholis bakeri</i>	15	9	11	-	-	6	22	18	12
<i>Asteronyx longifissus</i>	24	-	-	-	-	-	-	24	11
<i>Crangon nigromaculata</i>	9	14	9	47	58	3	-	-	11
<i>Stylatula elongata</i>	10	10	12	0	13	27	4	-	10
<i>Opisthoteuthis</i> sp A	15	4	6	-	-	-	-	21	10
<i>Acanthodoris brunnea</i>	7	17	-	-	10	21	13	-	9
<i>Tritonia diomedea</i>	13	7	2	-	3	18	17	3	9
<i>Suberites latus</i>	17	-	2	16	-	3	4	15	8
<i>Heterocrypta occidentalis</i>	1	15	13	8	23	15	-	-	8
<i>Metacarcinus gracilis</i>	6	8	12	-	39	6	-	-	8
<i>Rossia pacifica</i>	4	14	7	-	3	6	48	3	8
<i>Brisaster latifrons</i>	11	7	3	-	-	-	26	12	8

Species*	Percent of Area								
	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Pyromaia tuberculata</i>	4	11	9	39	29	9	-	-	8
<i>Chorilia longipes</i>	10	9	-	-	-	-	4	15	7
<i>Cancellaria crawfordiana</i>	12	4	-	-	-	-	-	15	7
<i>Pseudarchaster pusillus</i>	3	9	12	-	-	-	-	15	7
<i>Pentamera pseudocalcigera</i>	15	-	-	-	-	-	-	15	7
<i>Armina californica</i>	5	14	-	-	3	18	9	-	7
<i>Brisaster</i> sp	8	4	6	-	-	-	9	12	6
<i>Astropecten ornatissimus</i>	5	-	16	-	-	3	43	3	6
<i>Aglaophenia struthionides</i>	8	6	-	-	13	12	-	-	6
<i>Actinostola</i> sp A	9	4	-	-	-	-	-	12	5
<i>Glyptolithodes cristatipes</i>	3	9	6	-	-	-	-	12	5
<i>Metacrangon spinosissima</i>	9	1	3	-	-	-	30	6	5
<i>Luidia asthenosoma</i>	3	6	10	-	3	9	9	3	5
<i>Doryteuthis opalescens</i>	-	9	9	7	-	12	17	-	5
<i>Pisaster brevispinus</i>	9	-	2	-	23	3	-	-	4
<i>Florometra serratissima</i>	2	4	9	-	-	6	13	3	4
<i>Metridium farcimen</i>	5	3	3	-	-	3	22	3	4
<i>Parastichopus</i> sp LA2	-	9	6	-	-	-	-	9	4
<i>Leptogorgia chilensis</i>	-	10	4	-	3	12	-	-	4
<i>Gorgonocephalus eucnemis</i>	2	4	7	-	-	-	30	3	4
<i>Megasurcula carpenteriana</i>	3	8	-	-	-	9	-	3	4
<i>Paguristes turgidus</i>	3	7	2	-	-	3	4	6	4
<i>Crangon alaskensis</i>	5	6	-	-	-	12	4	-	4
<i>Mediaster aequalis</i>	1	10	2	-	-	6	9	3	4
<i>Flabellina iodinea</i>	-	11	-	-	6	9	-	-	4
<i>Hemisquilla californiensis</i>	-	3	12	-	6	9	-	-	4
<i>Neosimnia loebbeckeana</i>	-	8	4	-	-	12	-	-	4
<i>Neosimnia barbarensis</i>	2	6	4	-	-	12	-	-	4
<i>Bugula neritina</i>	-	8	4	-	-	12	-	-	4
<i>Hinea insculpta</i>	1	10	-	-	-	-	9	6	3
<i>Arctonoe pulchra</i>	-	7	6	-	-	9	9	-	3
<i>Virgularia californica</i>	3	6	-	16	-	6	-	3	3
<i>Thesea</i> sp	-	7	4	-	3	9	-	-	3
<i>Laqueus californianus</i>	7	-	-	-	-	6	-	3	3
<i>Loxorhynchus grandis</i>	-	7	2	-	6	6	-	-	3
<i>Luidia armata</i>	2	3	4	-	6	6	-	-	3
<i>Calliostoma platinum</i>	3	4	-	-	-	-	-	6	3
<i>Munida hispida</i>	-	9	-	-	-	-	-	6	3
<i>Pennatula californica</i>	6	-	-	-	-	-	-	6	3
<i>Stephanauge</i> sp A	-	-	12	-	-	-	-	6	3
<i>Halipteris californica</i>	6	-	-	-	-	-	-	6	3
<i>Stachyptilum superbum</i>	6	-	-	-	-	-	-	6	3
<i>Loxorhynchus crispatus</i>	5	-	2	-	3	6	4	-	3
<i>Paralithodes rathbuni</i>	2	4	2	-	-	-	13	3	3
<i>Metacarcinus anthonyi</i>	3	-	5	12	6	3	4	-	2
<i>Pandalus danae</i>	5	-	-	-	6	-	-	3	2

Species*	Percent of Area								
	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Pagurus spilocarpus</i>	-	3	6	-	3	6	-	-	2
<i>Parastichopus</i> sp	4	1	-	-	-	6	4	-	2
<i>Aphrodita castanea</i>	3	1	2	-	-	-	9	3	2
<i>Pugettia producta</i>	1	3	2	8	13	-	-	-	2
<i>Platymera gaudichaudii</i>	1	4	-	-	10	-	4	-	2
<i>Podochela lobifrons</i>	1	2	4	-	6	3	-	-	2
<i>Amphichondrius granulatus</i>	2	3	-	-	6	-	9	-	2
<i>Lamellaria diegoensis</i>	4	-	-	-	3	3	4	-	2
<i>Cancer productus</i>	4	-	-	-	3	3	4	-	2
<i>Barbarofusus barbarensis</i>	2	-	4	-	-	6	-	-	2
<i>Calliostoma turbinum</i>	2	-	4	-	-	6	-	-	2
<i>Styela</i> sp	-	3	4	-	-	6	-	-	2
<i>Telesto californica</i>	-	-	8	-	-	6	-	-	2
<i>Eugorgia rubens</i>	-	3	4	-	-	6	-	-	2
<i>Corynactis californica</i>	-	6	-	-	-	6	-	-	2
<i>Babelomurex oldroydi</i>	-	3	4	-	-	6	-	-	2
<i>Heptacarpus</i> sp	4	-	-	-	-	-	4	3	2
<i>Lopholithodes foraminatus</i>	3	-	2	-	-	-	4	3	2
<i>Ophiacantha diplasia</i>	-	4	2	-	-	-	4	3	2
<i>Sicyonia penicillata</i>	-	5	-	16	10	-	-	-	2
<i>Pandalus jordani</i>	4	-	-	-	-	3	9	-	2
<i>Triopha maculata</i>	3	-	-	-	10	-	-	-	2
<i>Dendronotus frondosus</i>	1	3	-	-	10	-	-	-	2
<i>Aphrodita armifera</i>	2	2	-	-	3	3	-	-	1
<i>Abietenaria inconstans</i>	-	2	4	-	3	3	-	-	1
<i>Henricia leviuscula</i>	1	-	4	-	3	3	-	-	1
<i>Muricea californica</i>	1	-	4	-	3	3	-	-	1
<i>Dendronotus iris</i>	-	3	2	-	3	3	-	-	1
<i>Liponema brevicornis</i>	-	4	-	-	-	-	-	3	1
<i>Epizoanthus leptoderma</i>	-	4	-	-	-	-	-	3	1
Spatangoida	3	-	-	-	-	-	-	3	1
<i>Cranopsis multistriata</i>	-	4	-	-	-	-	-	3	1
<i>Spirontocaris</i> sp	-	4	-	-	-	-	-	3	1
<i>Brissopsis</i> sp LA 1	-	4	-	-	-	-	-	3	1
<i>Stephanauge annularis</i>	-	4	-	-	-	-	-	3	1
<i>Thrissacanthias penicillatus</i>	-	4	-	-	-	-	-	3	1
<i>Parapagurus benedicti</i>	-	4	-	-	-	-	-	3	1
<i>Aphrocallistes vastus</i>	-	4	-	-	-	-	-	3	1
<i>Parastichopus</i> sp A	3	-	-	-	-	-	-	3	1
Pandalidae	-	-	6	-	-	-	-	3	1
<i>Antiplanes thalea</i>	3	-	-	-	-	-	-	3	1
<i>Anthoptilum grandiflorum</i>	-	4	-	-	-	-	-	3	1
<i>Rathbunaster californicus</i>	-	-	6	-	-	-	-	3	1
Alcyonacea	-	4	-	-	-	-	-	3	1
<i>Callianopsis goniophthalma</i>	3	-	-	-	-	-	-	3	1
Caridea	-	-	6	-	-	-	-	3	1

Species*	Percent of Area								
	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Actinostola sp</i>	-	4	-	-	-	-	-	3	1
<i>Rocinela angustata</i>	3	-	-	-	-	-	-	3	1
<i>Boreotrophon eucymatus</i>	-	-	6	-	-	-	-	3	1
<i>Farfantepenaeus californiensis</i>	-	2	3	25	6	-	-	-	1
<i>Paguristes bakeri</i>	2	-	2	-	-	3	4	-	1
<i>Ptilosarcus gurneyi</i>	-	3	2	-	-	3	4	-	1
<i>Calinaticina oldroydii</i>	2	-	-	-	-	-	13	-	1
<i>Renilla koellikeri</i>	-	-	5	0	6	-	-	-	1
<i>Portunus xantusii</i>	-	-	5	-	6	-	-	-	1
Cancridae	-	2	2	-	6	-	-	-	1
<i>Thalamoporella californica</i>	1	2	-	-	6	-	-	-	1
Hydrozoa	-	3	-	-	6	-	-	-	1
<i>Astropecten armatus</i>	-	3	-	-	6	-	-	-	1
<i>Heptacarpus tenuissimus</i>	2	-	-	-	3	-	4	-	1
<i>Cystodytes lobatus</i>	-	3	-	-	-	3	-	-	1
<i>Cellaria diffusa</i>	-	-	4	-	-	3	-	-	1
<i>Virgularia agassizii</i>	-	-	4	-	-	3	-	-	1
<i>Crisia occidentalis</i>	-	3	-	-	-	3	-	-	1
<i>Terebratalia transversa</i>	2	-	-	-	-	3	-	-	1
<i>Boreotrophon bentleyi</i>	-	3	-	-	-	3	-	-	1
<i>Dendrobeatia curvirostris</i>	-	-	4	-	-	3	-	-	1
<i>Tochuina tetraquetra</i>	2	-	-	-	-	3	-	-	1
<i>Doriopsilla spaldingi</i>	-	-	4	-	-	3	-	-	1
<i>Diaulula sandiegensis</i>	-	-	4	-	-	3	-	-	1
<i>Stylasterias forreri</i>	2	-	-	-	-	3	-	-	1
<i>Loxorhynchus sp</i>	-	-	4	-	-	3	-	-	1
<i>Geodia gibberosa</i>	-	-	4	-	-	3	-	-	1
<i>Nymphon pixellae</i>	-	-	4	-	-	3	-	-	1
<i>Pycnopodia helianthoides</i>	2	-	-	-	-	3	-	-	1
<i>Ophionereis eurybrachioplax</i>	2	-	-	-	-	3	-	-	1
<i>Orthopagurus minimus</i>	-	3	-	-	-	3	-	-	1
<i>Moloha faxoni</i>	-	-	4	-	-	3	-	-	1
<i>Mitra idae</i>	-	-	4	-	-	3	-	-	1
<i>Xestospongia edapha</i>	2	-	-	-	-	3	-	-	1
<i>Heptacarpus stimpsoni</i>	-	3	-	-	-	3	-	-	1
<i>Luidia sp</i>	-	3	-	-	-	3	-	-	1
<i>Ocinebrina foveolata</i>	-	-	4	-	-	3	-	-	1
<i>Lovenia cordiformis</i>	-	3	-	-	-	3	-	-	1
<i>Kelletia kelletii</i>	-	-	4	-	-	3	-	-	1
<i>Podochela hemphillii</i>	-	-	4	-	-	3	-	-	1
<i>Paracyathus stearnsii</i>	-	-	4	-	-	3	-	-	1
<i>Plumularia setacea</i>	-	3	-	-	-	3	-	-	1
<i>Schmittius politus</i>	-	-	4	-	-	3	-	-	1
<i>Havelockia benti</i>	2	-	-	-	-	3	-	-	1
<i>Halecium sp</i>	-	3	-	-	-	3	-	-	1
<i>Philine alba</i>	-	3	-	-	-	3	-	-	1

Species*	Percent of Area								
	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Janetogalatea californiensis</i>	2	-	-	-	-	3	-	-	1
<i>Silicea</i> sp OC1	-	-	4	-	-	3	-	-	1
<i>Parastichopus leucothele</i>	2	-	-	-	-	-	9	-	1
<i>Pteropurpura festiva</i>	-	2	-	8	3	-	-	-	1
<i>Panulirus interruptus</i>	-	-	2	3	3	-	-	-	1
<i>Pilumnus spinohirsutus</i>	-	2	-	-	3	-	-	-	1
<i>Pisaster giganteus capitatus</i>	-	-	2	-	3	-	-	-	1
<i>Randallia ornata</i>	-	2	-	-	3	-	-	-	1
<i>Strongylocentrotus purpuratus</i>	1	-	-	-	3	-	-	-	1
<i>Pugettia richii</i>	1	-	-	-	3	-	-	-	1
<i>Promartynia (tegula) pulligo</i>	1	-	-	-	3	-	-	-	1
<i>Polycera atra</i>	1	-	-	-	3	-	-	-	1
<i>Pachythyone rubra</i>	1	-	-	-	3	-	-	-	1
<i>Paguristes ulreyi</i>	-	2	-	-	3	-	-	-	1
<i>Pagurus quaylei</i>	-	-	2	-	3	-	-	-	1
<i>Pagurus redondoensis</i>	-	2	-	-	3	-	-	-	1
<i>Amphiodia psara</i>	-	-	2	-	3	-	-	-	1
<i>Melibe leonina</i>	1	-	-	-	3	-	-	-	1
<i>Romaleon jordani</i>	-	-	2	-	3	-	-	-	1
<i>Romaleon branneri</i>	1	-	-	-	3	-	-	-	1
<i>Conus californicus</i>	1	-	-	-	3	-	-	-	1
<i>Caesia fossatus</i>	-	-	2	-	3	-	-	-	1
<i>Cliona californiana</i>	1	-	-	-	3	-	-	-	1
<i>Heptacarpus palpator</i>	1	-	-	-	3	-	-	-	1
<i>Dysidea fragilis</i>	-	2	-	-	3	-	-	-	1
<i>Epitonium sawinae</i>	1	-	-	-	3	-	-	-	1
<i>Caesia perpinguis</i>	-	2	-	-	3	-	-	-	1
<i>Pentamera</i> sp	-	1	-	-	-	-	4	-	0
<i>Enallopaguropsis guatemoci</i>	-	-	2	-	-	-	4	-	0
<i>Platydoris macfarlandi</i>	-	-	2	-	-	-	4	-	0
<i>Parastichopus</i> sp SD1	-	-	2	-	-	-	4	-	0
<i>Paralithodes californiensis</i>	1	-	-	-	-	-	4	-	0
<i>Antiplanes catalinae</i>	-	1	-	-	-	-	4	-	0
<i>Rhynocrangon alata</i>	-	-	2	-	-	-	4	-	0
<i>Neocrangon</i> sp	1	-	-	-	-	-	4	-	0
<i>Odontaster crassus</i>	-	-	2	-	-	-	4	-	0
<i>Neocrangon communis</i>	1	-	-	-	-	-	4	-	0
<i>Hippasteria spinosa</i>	1	-	-	-	-	-	4	-	0
<i>Bulla gouldiana</i>	-	-	1	31	-	-	-	-	0
<i>Silicea</i> sp WS1	-	-	1	28	-	-	-	-	0
<i>Arcularia tiarula</i>	-	-	1	26	-	-	-	-	0
<i>Navanax inermis</i>	-	-	1	24	0	-	-	-	0
<i>Haminoea vesicula</i>	-	-	0	9	-	-	-	-	0
<i>Polyonyx quadriungulatus</i>	-	0	-	8	-	-	-	-	0
<i>Eudendrium</i> sp	-	0	-	8	-	-	-	-	0
<i>Virgularia</i> sp	-	0	-	8	-	-	-	-	0

Species*	Percent of Area								
	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Amathia distans</i>	-	0	-	8	-	-	-	-	0
<i>Ancula gibbosa</i>	-	-	0	3	-	-	-	-	0
<i>Musculista senhousia</i>	-	-	0	0	-	-	-	-	0
<i>Dendraster excentricus</i>	-	-	0	0	-	-	-	-	0
<i>Parastichopus parvimensis</i>	-	-	0	-	0	-	-	-	0

*See Appendix E for common names of invertebrate species

N = Northern; C = Central; S = Southern; B&H = Bays and harbors; IS = Inner shelf; MS = Middle shelf;

OS = Outer shelf; SCB = Southern California Bight

0 = Present in less than 0.5% of area

Appendix D-2. Abundance (number of individuals) of megabenthic invertebrate species by subpopulation on the southern California Shelf and upper slope at depths of 2-484 m, July-October 2008

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Brisaster townsendi</i>	42,705	165	97	-	-	-	13	42,954	42,967
<i>Myxoderma platyacanthum</i>	42,035	156	14	-	-	-	-	42,205	42,205
			27,32						
<i>Brissopsis pacifica</i>	3,289	1,593	3	-	-	4	61	32,140	32,205
		25,31				29,36			
<i>Lytechinus pictus</i>	156	5	4,043	2	123	6	23	-	29,514
<i>Asteronyx longifissus</i>	18,447	-	-	-	-	-	-	18,447	18,447
			10,76				5,80		
<i>Strongylocentrotus fragilis</i>	1,238	3,928	5	-	-	1	0	10,130	15,931
							1,32		
<i>Sicyonia ingentis</i>	2,235	517	816	56	20	2,146	4	22	3,568
<i>Pannychia moseleyi</i>	2,272	28	-	-	-	-	-	2,300	2,300
Goniasteridae	1,274	-	-	-	-	-	-	1,274	1,274
<i>Spirontocaris holmesi</i>	1,174	38	-	-	-	-	73	1,139	1,212
<i>Brisaster</i> sp	1,149	33	4	-	-	-	125	1,061	1,186
<i>Brisaster latifrons</i>	763	107	114	-	-	-	333	651	984
<i>Neocrangon zacaе</i>	587	188	169	-	-	5	812	127	944
<i>Astropecten verrilli</i>	187	549	105	-	334	489	17	1	841
<i>Acanthoptilum</i> sp	71	177	528	490	1	253	32	-	776
<i>Ophiura luetkenii</i>	133	382	213	-	2	708	13	5	728
<i>Laqueus californianus</i>	468	-	-	-	-	467	-	1	468
<i>Philine auriformis</i>	163	277	1	16	109	208	54	54	441
<i>Spatangus californicus</i>	173	24	229	-	-	11	223	192	426
<i>Pleurobranchaea californica</i>	289	47	49	-	17	64	148	156	385
<i>Pyromaia tuberculata</i>	7	47	312	340	23	3	-	-	366
<i>Luidia foliolata</i>	113	79	65	-	7	127	104	19	257
<i>Spirontocaris sica</i>	170	46	39	-	-	-	-	255	255
<i>Neocrangon resima</i>	126	59	38	-	-	-	97	126	223
<i>Suberites latus</i>	213	-	10	8	-	8	2	205	223
<i>Crangon nigromaculata</i>	37	141	36	114	97	3	-	-	214
<i>Parastichopus californicus</i>	31	103	66	-	10	185	5	-	200
<i>Astropecten ornatissimus</i>	137	-	49	-	-	97	88	1	186
<i>Ophiopholis bakeri</i>	155	4	8	-	-	6	8	153	167
<i>Dromalia alexandri</i>	4	57	90	-	-	-	14	137	151
<i>Octopus californicus</i>	104	16	29	-	-	-	11	138	149
<i>Hamatoscalpellum californicum</i>	81	66	1	-	26	122	-	-	148
<i>Octopus rubescens</i>	119	9	19	-	47	49	44	7	147
<i>Munida hispida</i>	-	120	-	-	-	-	-	120	120
<i>Pandalus platyceros</i>	55	60	4	-	12	5	18	84	119
<i>Stylatula elongata</i>	58	5	38	2	4	94	1	-	101
<i>Ophiothrix spiculata</i>	10	44	41	14	12	67	2	-	95

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Terebratalia transversa</i>	94	-	-	-	-	94	-	-	94
<i>Aphrodita japonica</i>	83	-	-	-	-	-	2	81	83
<i>Thesea</i> sp B	7	7	62	-	-	73	3	-	76
<i>Pentamera pseudocalcigera</i>	58	-	-	-	-	-	-	58	58
<i>Gorgonocephalus eucnemis</i>	15	3	37	-	-	-	52	3	55
<i>Metacarcinus gracilis</i>	7	13	31	-	49	2	-	-	51
<i>Bulla gouldiana</i>	-	-	44	44	-	-	-	-	44
<i>Thesea</i> sp	-	40	3	-	1	42	-	-	43
<i>Arcularia tiarula</i>	-	-	42	42	-	-	-	-	42
<i>Rossia pacifica</i>	5	16	17	-	1	5	31	1	38
<i>Metacrangon spinosissima</i>	29	1	7	-	-	-	30	7	37
<i>Heterocrypta occidentalis</i>	1	22	11	4	18	12	-	-	34
<i>Aglaophenia struthionides</i>	31	2	-	-	28	5	-	-	33
<i>Florometra serratissima</i>	23	3	7	-	-	24	6	3	33
<i>Doryteuthis opalescens</i>	-	7	25	4	-	21	7	-	32
<i>Neocrangon</i> sp	32	-	-	-	-	-	32	-	32
<i>Stachytilum superbum</i>	30	-	-	-	-	-	-	30	30
<i>Stephanauge annularis</i>	-	30	-	-	-	-	-	30	30
<i>Acanthodoris brunnea</i>	15	14	-	-	7	15	7	-	29
<i>Parastichopus</i> sp LA2	-	27	2	-	-	-	-	29	29
<i>Tritonia diomedea</i>	14	12	1	-	2	10	4	11	27
<i>Navanax inermis</i>	-	-	24	20	4	-	-	-	24
<i>Metacarcinus anthonyi</i>	3	-	20	6	14	1	2	-	23
<i>Luidia armata</i>	14	1	8	-	14	9	-	-	23
<i>Styela</i> sp	-	3	20	-	-	23	-	-	23
<i>Metridium farcimen</i>	18	1	4	-	-	1	21	1	23
<i>Armina californica</i>	10	10	-	-	3	11	6	-	20
<i>Pisaster brevispinus</i>	18	-	1	-	18	1	-	-	19
<i>Antiplanes thalea</i>	18	-	-	-	-	-	-	18	18
<i>Farfantepenaeus californiensis</i>	-	10	6	10	6	-	-	-	16
<i>Opisthoteuthis</i> sp A	12	1	1	-	-	-	-	14	14
<i>Dendronotus iris</i>	-	11	3	-	3	11	-	-	14
<i>Chorilia longipes</i>	5	9	-	-	-	-	1	13	14
<i>Parapagurus benedicti</i>	-	13	-	-	-	-	-	13	13
<i>Actinostola</i> sp A	11	1	-	-	-	-	-	12	12
<i>Silicea</i> sp WS1	-	-	12	12	-	-	-	-	12
<i>Janetogalthea californiensis</i>	12	-	-	-	-	12	-	-	12
<i>Pseudarchaster pusillus</i>	3	6	3	-	-	-	-	12	12
<i>Stephanauge</i> sp A	-	-	12	-	-	-	-	12	12
<i>Astropecten armatus</i>	-	11	-	-	11	-	-	-	11
<i>Neosimnia loebbeckeana</i>	-	9	2	-	-	11	-	-	11
<i>Spatangoida</i>	11	-	-	-	-	-	-	11	11
<i>Dendronotus frondosus</i>	1	10	-	-	11	-	-	-	11
Alcyonacea	-	10	-	-	-	-	-	10	10
<i>Flabellina iodinea</i>	-	10	-	-	4	6	-	-	10

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Triopha maculata</i>	10	-	-	-	10	-	-	-	10
<i>Ophionereis eurybrachioplax</i>	10	-	-	-	-	10	-	-	10
<i>Cancellaria crawfordiana</i>	8	1	-	-	-	-	-	9	9
<i>Luidia asthenosoma</i>	1	4	4	-	2	4	2	1	9
<i>Portunus xantusii</i>	-	-	9	-	9	-	-	-	9
<i>Pugettia producta</i>	1	4	3	4	4	-	-	-	8
<i>Glyptolithodes cristatipes</i>	1	5	2	-	-	-	-	8	8
<i>Brissopsis</i> sp LA 1	-	8	-	-	-	-	-	8	8
<i>Sicyonia penicillata</i>	-	8	-	4	4	-	-	-	8
<i>Lamellaria diegoensis</i>	7	-	-	-	5	1	1	-	7
<i>Pandalus danae</i>	7	-	-	-	5	-	-	2	7
<i>Amphichondrius granulatus</i>	5	2	-	-	2	-	5	-	7
<i>Virgularia californica</i>	1	6	-	4	-	2	-	1	7
<i>Panulirus interruptus</i>	-	-	7	6	1	-	-	-	7
<i>Pennatula californica</i>	7	-	-	-	-	-	-	7	7
<i>Heptacarpus palpator</i>	6	-	-	-	6	-	-	-	6
<i>Loxorhynchus grandis</i>	-	3	3	-	4	2	-	-	6
<i>Callianopsis goniophthalma</i>	6	-	-	-	-	-	-	6	6
<i>Dendraster excentricus</i>	-	-	6	6	-	-	-	-	6
<i>Crangon alaskensis</i>	3	3	-	-	-	5	1	-	6
<i>Hinea insculpta</i>	1	5	-	-	-	-	3	3	6
<i>Paguristes turgidus</i>	2	3	1	-	-	2	1	3	6
<i>Hemisquilla californiensis</i>	-	2	3	-	2	3	-	-	5
<i>Mediaster aequalis</i>	1	3	1	-	-	2	2	1	5
<i>Loxorhynchus crispatus</i>	4	-	1	-	1	3	1	-	5
<i>Promartynia (tegula) pulligo</i>	5	-	-	-	5	-	-	-	5
<i>Renilla koellikeri</i>	-	-	5	2	3	-	-	-	5
<i>Arctonoe pulchra</i>	-	3	2	-	-	3	2	-	5
<i>Leptogorgia chilensis</i>	-	4	1	-	1	4	-	-	5
<i>Platymera gaudichaudii</i>	1	4	-	-	4	-	1	-	5
<i>Neosimnia barbarensis</i>	1	3	1	-	-	5	-	-	5
<i>Paguristes bakeri</i>	2	-	2	-	-	2	2	-	4
<i>Halipteris californica</i>	4	-	-	-	-	-	-	4	4
<i>Heptacarpus tenuissimus</i>	4	-	-	-	2	-	2	-	4
<i>Ophiacantha diplasia</i>	-	1	3	-	-	-	3	1	4
<i>Bugula neritina</i>	-	3	1	-	-	4	-	-	4
<i>Paralithodes rathbuni</i>	2	1	1	-	-	-	3	1	4
<i>Pagurus quaylei</i>	-	-	4	-	4	-	-	-	4
<i>Stylasterias forreri</i>	4	-	-	-	-	4	-	-	4
<i>Haminoea vesicula</i>	-	-	4	4	-	-	-	-	4
<i>Ancula gibbosa</i>	-	-	4	4	-	-	-	-	4
<i>Parastichopus</i> sp	3	1	-	-	-	3	1	-	4
<i>Aphrodita castanea</i>	2	1	1	-	-	-	2	2	4
<i>Megasurcula carpenteriana</i>	1	3	-	-	-	3	-	1	4

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Podochela lobifrons</i>	1	1	1	-	2	1	-	-	3
<i>Paralithodes californiensis</i>	3	-	-	-	-	-	3	-	3
<i>Strongylocentrotus purpuratus</i>	3	-	-	-	3	-	-	-	3
<i>Virgularia agassizii</i>	-	-	3	-	-	3	-	-	3
<i>Pagurus spilocarpus</i>	-	1	2	-	1	2	-	-	3
Cancridae	-	1	2	-	3	-	-	-	3
<i>Conus californicus</i>	1	-	2	2	1	-	-	-	3
<i>Pachythyone rubra</i>	3	-	-	-	3	-	-	-	3
<i>Eugorgia rubens</i>	-	2	1	-	-	3	-	-	3
<i>Heptacarpus</i> sp	3	-	-	-	-	-	1	2	3
<i>Barbarofusus barborensis</i>	2	-	1	-	-	3	-	-	3
<i>Pteropurpura festiva</i>	-	3	-	2	1	-	-	-	3
<i>Calinaticina oldroydii</i>	3	-	-	-	-	-	3	-	3
<i>Abietenaria inconstans</i>	-	1	2	-	1	2	-	-	3
<i>Pandalus jordani</i>	3	-	-	-	-	1	2	-	3
<i>Pentamera</i> sp	-	3	-	-	-	-	3	-	3
<i>Cancer productus</i>	3	-	-	-	1	1	1	-	3
<i>Melibe leonina</i>	3	-	-	-	3	-	-	-	3
<i>Hippasteria spinosa</i>	2	-	-	-	-	-	2	-	2
<i>Babelomurex oldroydi</i>	-	1	1	-	-	2	-	-	2
<i>Thalamoporella californica</i>	1	1	-	-	2	-	-	-	2
<i>Paracyathus steamsii</i>	-	-	2	-	-	2	-	-	2
<i>Virgularia</i> sp	-	2	-	2	-	-	-	-	2
<i>Telesto californica</i>	-	-	2	-	-	2	-	-	2
<i>Podochela hemphillii</i>	-	-	2	-	-	2	-	-	2
<i>Cliona californiana</i>	2	-	-	-	2	-	-	-	2
<i>Amathia distans</i>	-	2	-	2	-	-	-	-	2
<i>Aphrodita armifera</i>	1	1	-	-	1	1	-	-	2
<i>Corynactis californica</i>	-	2	-	-	-	2	-	-	2
<i>Ptilosarcus gurneyi</i>	-	1	1	-	-	1	1	-	2
<i>Calliostoma platinum</i>	1	1	-	-	-	-	-	2	2
<i>Calliostoma turbinum</i>	1	-	1	-	-	2	-	-	2
<i>Parastichopus parvimensis</i>	-	-	2	-	2	-	-	-	2
<i>Parastichopus leucothele</i>	2	-	-	-	-	-	2	-	2
<i>Parastichopus</i> sp A	2	-	-	-	-	-	-	2	2
<i>Muricea californica</i>	1	-	1	-	1	1	-	-	2
<i>Xestospongia edapha</i>	2	-	-	-	-	2	-	-	2
<i>Schmittius politus</i>	-	-	2	-	-	2	-	-	2
<i>Polyonyx quadriungulatus</i>	-	2	-	2	-	-	-	-	2
Hydrozoa	-	2	-	-	2	-	-	-	2
<i>Orthopagurus minimus</i>	-	2	-	-	-	2	-	-	2
<i>Luidia</i> sp	-	2	-	-	-	2	-	-	2
<i>Henricia leviuscula</i>	1	-	1	-	1	1	-	-	2
<i>Musculista senhousia</i>	-	-	2	2	-	-	-	-	2
<i>Eudendrium</i> sp	-	2	-	2	-	-	-	-	2
<i>Lopholithodes foraminatus</i>	1	-	1	-	-	-	1	1	2
<i>Rocinela angustata</i>	2	-	-	-	-	-	-	2	2

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Silicea</i> sp OC1	-	-	1	-	-	1	-	-	1
<i>Ocinebrina foveolata</i>	-	-	1	-	-	1	-	-	1
<i>Philine alba</i>	-	1	-	-	-	1	-	-	1
<i>Nymphon pixellae</i>	-	-	1	-	-	1	-	-	1
<i>Boreotrophon bentleyi</i>	-	1	-	-	-	1	-	-	1
<i>Boreotrophon eucymatus</i>	-	-	1	-	-	-	-	1	1
<i>Pilumnus spinohirsutus</i>	-	1	-	-	1	-	-	-	1
<i>Thrissacanthias penicillatus</i>	-	1	-	-	-	-	-	1	1
<i>Tochuina tetraquetra</i>	1	-	-	-	-	1	-	-	1
<i>Anthoptilum grandiflorum</i>	-	1	-	-	-	-	-	1	1
<i>Polycera atra</i>	1	-	-	-	1	-	-	-	1
<i>Actinostola</i> sp	-	1	-	-	-	-	-	1	1
<i>Neocrangon communis</i>	1	-	-	-	-	-	1	-	1
<i>Romaleon branneri</i>	1	-	-	-	1	-	-	-	1
<i>Plumularia setacea</i>	-	1	-	-	-	1	-	-	1
<i>Pisaster giganteus capitatus</i>	-	-	1	-	1	-	-	-	1
<i>Romaleon jordani</i>	-	-	1	-	1	-	-	-	1
<i>Rathbunaster californicus</i>	-	-	1	-	-	-	-	1	1
<i>Antiplanes catalinae</i>	-	1	-	-	-	-	1	-	1
<i>Platydoris macfarlandi</i>	-	-	1	-	-	-	1	-	1
<i>Aphrocallistes vastus</i>	-	1	-	-	-	-	-	1	1
<i>Moloha faxoni</i>	-	-	1	-	-	1	-	-	1
<i>Lovenia cordiformis</i>	-	1	-	-	-	1	-	-	1
<i>Mitra idae</i>	-	-	1	-	-	1	-	-	1
<i>Amphiodia psara</i>	-	-	1	-	1	-	-	-	1
<i>Havelockia bentii</i>	1	-	-	-	-	1	-	-	1
<i>Enallopaguropsis guatemoci</i>	-	-	1	-	-	-	1	-	1
Pandalidae	-	-	1	-	-	-	-	1	1
<i>Dysidea fragilis</i>	-	1	-	-	1	-	-	-	1
<i>Rhynocrangon alata</i>	-	-	1	-	-	-	1	-	1
<i>Epizoanthus leptoderma</i>	-	1	-	-	-	-	-	1	1
<i>Diaulula sandiegensis</i>	-	-	1	-	-	1	-	-	1
<i>Pagurus redondoensis</i>	-	1	-	-	1	-	-	-	1
<i>Geodia gibberosa</i>	-	-	1	-	-	1	-	-	1
<i>Dendrobeania curvirostris</i>	-	-	1	-	-	1	-	-	1
<i>Paguristes ulreyi</i>	-	1	-	-	1	-	-	-	1
<i>Cystodytes lobatus</i>	-	1	-	-	-	1	-	-	1
<i>Crisia occidentalis</i>	-	1	-	-	-	1	-	-	1
<i>Cranopsis multistriata</i>	-	1	-	-	-	-	-	1	1
<i>Odontaster crassus</i>	-	-	1	-	-	-	1	-	1
<i>Kelletia kelletii</i>	-	-	1	-	-	1	-	-	1
<i>Doriopsilla spaldingi</i>	-	-	1	-	-	1	-	-	1
<i>Parastichopus</i> sp SD1	-	-	1	-	-	-	1	-	1
<i>Epitonium sawinae</i>	1	-	-	-	1	-	-	-	1
<i>Caesia fossatus</i>	-	-	1	-	1	-	-	-	1
<i>Caesia perpinguis</i>	-	1	-	-	1	-	-	-	1

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Spirontocaris</i> sp	-	1	-	-	-	-	-	1	1
<i>Randallia ornata</i>	-	1	-	-	1	-	-	-	1
<i>Halecium</i> sp	-	1	-	-	-	1	-	-	1
<i>Pycnopodia helianthoides</i>	1	-	-	-	-	1	-	-	1
<i>Pugettia richii</i>	1	-	-	-	1	-	-	-	1
Caridea	-	-	1	-	-	-	-	1	1
<i>Cellaria diffusa</i>	-	-	1	-	-	1	-	-	1
<i>Heptacarpus stimpsoni</i>	-	1	-	-	-	1	-	-	1
<i>Loxorhynchus</i> sp	-	-	1	-	-	1	-	-	1
<i>Liponema brevicornis</i>	-	1	-	-	-	-	-	1	1
Total	120,97 3	34,83 0	45,84 6	1,23 2	1,15 6	35,00 2	9,70 7	154,55 2	201,64 9

*See Appendix E for common names of invertebrate species

N = Northern; C = Central; S = Southern; B&H = Bays and harbors; IS = Inner shelf; MS = Middle shelf; OS = Outer shelf; SCB = Southern California Bight

Appendix D-3. Biomass (kg) of megabenthic invertebrate species by subpopulation on the southern California shelf at depths of 2-484 m, July-October 2008

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Brisaster townsendi</i>	670.0	2.8	0.6	-	-	-	0.5	672.9	673.4
<i>Strongylocentrotus fragilis</i>	73.6	102.7	205.4	-	-	0.0	169.2	212.5	381.7
<i>Brissopsis pacifica</i>	64.3	28.6	191.4	-	-	0.0	2.1	282.1	284.2
<i>Suberites latus</i>	15.8	-	124.4	124.4	-	0.1	0.0	15.7	140.2
<i>Myxoderma platyacanthum</i>	126.4	2.0	0.4	-	-	-	-	128.8	128.8
<i>Parastichopus californicus</i>	16.5	44.2	25.9	-	1.4	83.0	2.2	-	86.7
<i>Sicyonia ingentis</i>	38.4	10.2	16.0	0.7	0.1	33.4	29.8	0.5	64.5
<i>Asteronyx longifissus</i>	54.9	-	-	-	-	-	-	54.9	54.9
<i>Lytechinus pictus</i>	0.1	40.8	8.3	0.0	0.1	49.1	0.0	-	49.2
<i>Pannychia moseleyi</i>	35.7	1.6	-	-	-	-	-	37.3	37.3
<i>Spatangus californicus</i>	14.1	3.4	15.5	-	-	0.5	14.0	18.4	32.9
<i>Octopus californicus</i>	15.1	2.4	3.6	-	-	-	1.4	19.7	21.1
<i>Silicea</i> sp WS1	-	-	17.2	17.2	-	-	-	-	17.2
<i>Metridium farcimen</i>	9.5	0.0	5.3	-	-	0.0	14.8	0.0	14.8
<i>Luidia foliolata</i>	5.1	2.7	3.7	-	0.3	7.0	4.0	0.2	11.5
<i>Pleurobranchaea californica</i>	4.7	2.5	1.9	-	0.0	1.4	5.2	2.5	9.1
<i>Gorgonocephalus eucnemis</i>	2.1	0.1	6.0	-	-	-	8.1	0.1	8.2
<i>Pandalus platyceros</i>	2.2	5.5	0.0	-	0.0	0.0	0.6	7.1	7.7
<i>Laqueus californianus</i>	7.6	-	-	-	-	7.6	-	0.0	7.6
<i>Brisaster latifrons</i>	3.8	0.9	2.1	-	-	-	4.1	2.7	6.8
<i>Actinostola</i> sp A	4.9	0.0	-	-	-	-	-	4.9	4.9
<i>Pisaster brevispinus</i>	4.3	-	0.5	-	4.8	0.0	-	-	4.8
<i>Loxorhynchus grandis</i>	-	3.3	1.2	-	1.2	3.3	-	-	4.5
<i>Dromalia alexandri</i>	0.0	2.1	2.2	-	-	-	0.4	3.9	4.3
<i>Brisaster</i> sp	3.5	0.0	0.0	-	-	-	0.9	2.6	3.5
<i>Opisthoteuthis</i> sp A	3.0	0.0	0.0	-	-	-	-	3.0	3.0
<i>Octopus rubescens</i>	2.2	0.3	0.5	-	1.0	0.9	1.1	0.0	3.0
Goniasteridae	2.6	-	-	-	-	-	-	2.6	2.6
<i>Metacarcinus gracilis</i>	0.6	0.9	1.0	-	2.0	0.5	-	-	2.5
<i>Metacarcinus anthonyi</i>	1.2	-	1.2	0.0	1.2	0.2	1.0	-	2.4
<i>Astropecten verrilli</i>	0.6	1.7	0.1	-	1.2	1.2	0.0	0.0	2.4
<i>Glyptolithodes cristatipes</i>	0.9	0.9	0.6	-	-	-	-	2.4	2.4
<i>Panulirus interruptus</i>	-	-	2.3	2.2	0.1	-	-	-	2.3
<i>Paralithodes californiensis</i>	2.2	-	-	-	-	-	2.2	-	2.2
<i>Silicea</i> sp OC1	-	-	2.0	-	-	2.0	-	-	2.0
<i>Parastichopus leucothele</i>	2.0	-	-	-	-	-	2.0	-	2.0
<i>Terebratalia transversa</i>	1.5	-	-	-	-	1.5	-	-	1.5
<i>Pycnopodia helianthoides</i>	1.5	-	-	-	-	1.5	-	-	1.5
Alcyonacea	-	1.4	-	-	-	-	-	1.4	1.4
<i>Astropecten ornatissimus</i>	0.4	-	1.0	-	-	0.0	1.4	0.0	1.4
<i>Eugorgia rubens</i>	-	0.0	1.3	-	-	1.3	-	-	1.3
<i>Munida hispida</i>	-	1.1	-	-	-	-	-	1.1	1.1
<i>Cancer productus</i>	1.0	-	-	-	0.1	0.3	0.6	-	1.0
<i>Aphrodita japonica</i>	1.0	-	-	-	-	-	0.2	0.8	1.0

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Rathbunaster californicus</i>	-	-	0.9	-	-	-	-	0.9	0.9
<i>Parastichopus</i> sp LA2	-	0.6	0.3	-	-	-	-	0.9	0.9
<i>Tritonia diomedea</i>	0.4	0.4	0.0	-	0.1	0.5	0.0	0.2	0.8
<i>Lopholithodes foraminatus</i>	0.3	-	0.5	-	-	-	0.5	0.3	0.8
<i>Parastichopus</i> sp	0.0	0.6	-	-	-	0.0	0.6	-	0.6
<i>Acanthoptilum</i> sp	0.0	0.2	0.4	0.4	0.0	0.2	0.0	-	0.6
<i>Farfantepenaeus californiensis</i>	-	0.3	0.2	0.1	0.4	-	-	-	0.5
<i>Neocrangon zacaе</i>	0.3	0.1	0.0	-	-	0.0	0.4	0.0	0.4
<i>Hemisquilla californiensis</i>	-	0.2	0.2	-	0.2	0.2	-	-	0.4
<i>Hippasteria spinosa</i>	0.4	-	-	-	-	-	0.4	-	0.4
<i>Aglaophenia struthionides</i>	0.4	0.0	-	-	0.4	0.0	-	-	0.4
<i>Parastichopus parvimensis</i>	-	-	0.4	-	0.4	-	-	-	0.4
<i>Luidia armata</i>	0.2	0.0	0.1	-	0.2	0.1	-	-	0.3
<i>Cystodytes lobatus</i>	-	0.3	-	-	-	0.3	-	-	0.3
<i>Cliona californiana</i>	0.3	-	-	-	0.3	-	-	-	0.3
<i>Triopha maculata</i>	0.3	-	-	-	0.3	-	-	-	0.3
<i>Brissopsis</i> sp LA 1	-	0.3	-	-	-	-	-	0.3	0.3
<i>Philine auriformis</i>	0.0	0.3	0.0	0.0	0.0	0.3	0.0	0.0	0.3
<i>Spirontocaris holmesi</i>	0.2	0.0	-	-	-	-	0.0	0.2	0.2
<i>Loxorhynchus crispatus</i>	0.0	-	0.2	-	0.0	0.0	0.2	-	0.2
<i>Actinostola</i> sp	-	0.2	-	-	-	-	-	0.2	0.2
<i>Stylasterias forreri</i>	0.2	-	-	-	-	0.2	-	-	0.2
<i>Crangon nigromaculata</i>	0.0	0.1	0.1	0.0	0.2	0.0	-	-	0.2
<i>Halipteris californica</i>	0.2	-	-	-	-	-	-	0.2	0.2
<i>Pisaster giganteus capitatus</i>	-	-	0.2	-	0.2	-	-	-	0.2
<i>Aphrocallistes vastus</i>	-	0.2	-	-	-	-	-	0.2	0.2
<i>Portunus xantusii</i>	-	-	0.2	-	0.2	-	-	-	0.2
<i>Platymera gaudichaudii</i>	0.0	0.2	-	-	0.2	-	0.0	-	0.2
<i>Paralithodes rathbuni</i>	0.0	0.2	0.0	-	-	-	0.0	0.2	0.2
<i>Navanax inermis</i>	-	-	0.2	0.2	0.0	-	-	-	0.2
<i>Leptogorgia chilensis</i>	-	0.2	0.0	-	0.0	0.2	-	-	0.2
<i>Calinaticina oldroydii</i>	0.2	-	-	-	-	-	0.2	-	0.2
<i>Florometra serratissima</i>	0.2	0.0	0.0	-	-	0.2	0.0	0.0	0.2
<i>Sicyonia penicillata</i>	-	0.2	-	0.1	0.1	-	-	-	0.2
<i>Ophiura luetkenii</i>	0.0	0.2	0.0	-	0.0	0.2	0.0	0.0	0.2
<i>Pugettia producta</i>	0.0	0.0	0.1	0.0	0.1	-	-	-	0.1
<i>Parastichopus</i> sp SD1	-	-	0.1	-	-	-	0.1	-	0.1
<i>Rossia pacifica</i>	0.0	0.0	0.1	-	0.0	0.0	0.1	0.0	0.1
<i>Thalamoporella californica</i>	0.1	0.0	-	-	0.1	-	-	-	0.1
<i>Parastichopus</i> sp A	0.1	-	-	-	-	-	-	0.1	0.1
<i>Astropecten armatus</i>	-	0.1	-	-	0.1	-	-	-	0.1
<i>Arctonoe pulchra</i>	-	0.1	0.0	-	-	0.0	0.1	-	0.1
<i>Neocrangon resima</i>	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0
<i>Doriopsilla spaldingi</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Diaulula sandiegensis</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Dendrobeatia curvirostris</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Dendronotus frondosus</i>	0.0	0.0	-	-	0.0	-	-	-	0.0
<i>Havelockia bentii</i>	0.0	-	-	-	-	0.0	-	-	0.0
<i>Dendraster excentricus</i>	-	-	0.0	0.0	-	-	-	-	0.0
<i>Dendronotus iris</i>	-	0.0	0.0	-	0.0	0.0	-	-	0.0
<i>Doryteuthis opalescens</i>	-	0.0	0.0	0.0	-	0.0	0.0	-	0.0

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Thesea</i> sp B	0.0	0.0	0.0	-	-	0.0	0.0	-	0.0
<i>Dysidea fragilis</i>	-	0.0	-	-	0.0	-	-	-	0.0
<i>Enallopaguropsis guatemoci</i>	-	-	0.0	-	-	-	0.0	-	0.0
<i>Epitonium sawinae</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Epizoanthus leptoderma</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Eudendrium</i> sp	-	0.0	-	0.0	-	-	-	-	0.0
<i>Geodia gibberosa</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Hamatoscalpellum californicum</i>	0.0	0.0	0.0	-	0.0	0.0	-	-	0.0
<i>Halecium</i> sp	-	0.0	-	-	-	0.0	-	-	0.0
<i>Thesea</i> sp	-	0.0	0.0	-	0.0	0.0	-	-	0.0
<i>Flabellina iodinea</i>	-	0.0	-	-	0.0	0.0	-	-	0.0
<i>Haminoea vesicula</i>	-	-	0.0	0.0	-	-	-	-	0.0
<i>Antiplanes catalinae</i>	-	0.0	-	-	-	-	0.0	-	0.0
<i>Calliostoma platinum</i>	0.0	0.0	-	-	-	-	-	0.0	0.0
<i>Barbarofusus barborensis</i>	0.0	-	0.0	-	-	0.0	-	-	0.0
<i>Babelomurex oldroydi</i>	-	0.0	0.0	-	-	0.0	-	-	0.0
<i>Virgularia californica</i>	0.0	0.0	-	0.0	-	0.0	-	0.0	0.0
<i>Armina californica</i>	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0
<i>Arcularia tiarula</i>	-	-	0.0	0.0	-	-	-	-	0.0
<i>Aphrodita castanea</i>	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0
<i>Boreotrophon eucymatus</i>	-	-	0.0	-	-	-	-	0.0	0.0
<i>Antiplanes thalea</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Virgularia agassizii</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Anthoptilum grandiflorum</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Ancula gibbosa</i>	-	-	0.0	0.0	-	-	-	-	0.0
<i>Amphiodia psara</i>	-	-	0.0	-	0.0	-	-	-	0.0
<i>Amphichondrius granulatus</i>	0.0	0.0	-	-	0.0	-	0.0	-	0.0
<i>Amathia distans</i>	-	0.0	-	0.0	-	-	-	-	0.0
<i>Virgularia</i> sp	-	0.0	-	0.0	-	-	-	-	0.0
<i>Acanthodoris brunnea</i>	0.0	0.0	-	-	0.0	0.0	0.0	-	0.0
<i>Aphrodita armifera</i>	0.0	0.0	-	-	0.0	0.0	-	-	0.0
<i>Cancellaria crawfordiana</i>	0.0	0.0	-	-	-	-	-	0.0	0.0
<i>Cranopsis multistriata</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Crangon alaskensis</i>	0.0	0.0	-	-	-	0.0	0.0	-	0.0
<i>Corynactis californica</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Conus californicus</i>	0.0	-	0.0	0.0	0.0	-	-	-	0.0
<i>Thrissacanthias penicillatus</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Chorilia longipes</i>	0.0	0.0	-	-	-	-	0.0	0.0	0.0
<i>Cellaria diffusa</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Boreotrophon bentleyi</i>	-	0.0	-	-	-	0.0	-	-	0.0
Cancridae	-	0.0	0.0	-	0.0	-	-	-	0.0
<i>Crisia occidentalis</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Calliostoma turbinum</i>	0.0	-	0.0	-	-	0.0	-	-	0.0
<i>Callianopsis goniophthalma</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Caesia perpinguis</i>	-	0.0	-	-	0.0	-	-	-	0.0
<i>Caesia fossatus</i>	-	-	0.0	-	0.0	-	-	-	0.0
<i>Bulla gouldiana</i>	-	-	0.0	0.0	-	-	-	-	0.0
<i>Bugula neritina</i>	-	0.0	0.0	-	-	0.0	-	-	0.0
<i>Tochuina tetraquetra</i>	0.0	-	-	-	-	0.0	-	-	0.0
Caridea	-	-	0.0	-	-	-	-	0.0	0.0
Pandalidae	-	-	0.0	-	-	-	-	0.0	0.0

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Stachyptilum superbum</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Pentamera</i> sp	-	0.0	-	-	-	-	0.0	-	0.0
<i>Pentamera pseudocalcigera</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Pennatula californica</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Parapagurus benedicti</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Paracyathus stearnsii</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Spirontocaris sica</i>	0.0	0.0	0.0	-	-	-	-	0.0	0.0
<i>Spirontocaris</i> sp	-	0.0	-	-	-	-	-	0.0	0.0
<i>Pilumnus spinohirsutus</i>	-	0.0	-	-	0.0	-	-	-	0.0
<i>Pandalus danae</i>	0.0	-	-	-	0.0	-	-	0.0	0.0
<i>Spatangoida</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Pagurus spilocarpus</i>	-	0.0	0.0	-	0.0	0.0	-	-	0.0
<i>Pagurus redondoensis</i>	-	0.0	-	-	0.0	-	-	-	0.0
<i>Pagurus quaylei</i>	-	-	0.0	-	0.0	-	-	-	0.0
<i>Paguristes ulreyi</i>	-	0.0	-	-	0.0	-	-	-	0.0
<i>Paguristes turgidus</i>	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0
<i>Paguristes bakeri</i>	0.0	-	0.0	-	-	0.0	0.0	-	0.0
<i>Pachythyone rubra</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Liponema brevicornis</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Pandalus jordani</i>	0.0	-	-	-	-	0.0	0.0	-	0.0
<i>Pteropurpura festiva</i>	-	0.0	-	0.0	0.0	-	-	-	0.0
<i>Schmittius politus</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Romaleon jordani</i>	-	-	0.0	-	0.0	-	-	-	0.0
<i>Romaleon branneri</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Rocinela angustata</i>	0.0	-	-	-	-	-	-	0.0	0.0
<i>Rhynocrangon alata</i>	-	-	0.0	-	-	-	0.0	-	0.0
<i>Renilla koellikeri</i>	-	-	0.0	0.0	0.0	-	-	-	0.0
<i>Randallia ornata</i>	-	0.0	-	-	0.0	-	-	-	0.0
<i>Pyromaia tuberculata</i>	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.0
<i>Philine alba</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Ptilosarcus gurneyi</i>	-	0.0	0.0	-	-	0.0	0.0	-	0.0
<i>Ophiothrix spiculata</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0
<i>Pseudarchaster pusillus</i>	0.0	0.0	0.0	-	-	-	-	0.0	0.0
<i>Promartynia (tegula) pulligo</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Polyonyx quadriungulatus</i>	-	0.0	-	0.0	-	-	-	-	0.0
<i>Polycera atra</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Podochela lobifrons</i>	0.0	0.0	0.0	-	0.0	0.0	-	-	0.0
<i>Podochela hemphillii</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Plumularia setacea</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Platydoris macfarlandi</i>	-	-	0.0	-	-	-	0.0	-	0.0
<i>Pugettia richii</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Kelletia kellestii</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Orthopagurus minimus</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Mediaster aequalis</i>	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0
<i>Luidia</i> sp	-	0.0	-	-	-	0.0	-	-	0.0
<i>Stylatula elongata</i>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0
<i>Luidia asthenosoma</i>	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0
<i>Loxorhynchus</i> sp	-	-	0.0	-	-	0.0	-	-	0.0
<i>Telesto californica</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Lovenia cordiformis</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Melibe leonina</i>	0.0	-	-	-	0.0	-	-	-	0.0

Species*	Region			Shelf Zone					
	N	C	S	B&H	IS	MS	OS	US	SCB
<i>Lamellaria diegoensis</i>	0.0	-	-	-	0.0	0.0	0.0	-	0.0
<i>Abietenaria inconstans</i>	-	0.0	0.0	-	0.0	0.0	-	-	0.0
<i>Janetogalatea californiensis</i>	0.0	-	-	-	-	0.0	-	-	0.0
Hydrozoa	-	0.0	-	-	0.0	-	-	-	0.0
<i>Hinea insculpta</i>	0.0	0.0	-	-	-	-	0.0	0.0	0.0
<i>Heterocrypta occidentalis</i>	0.0	0.0	0.0	0.0	0.0	0.0	-	-	0.0
<i>Heptacarpus tenuissimus</i>	0.0	-	-	-	0.0	-	0.0	-	0.0
<i>Heptacarpus stimpsoni</i>	-	0.0	-	-	-	0.0	-	-	0.0
<i>Heptacarpus</i> sp	0.0	-	-	-	-	-	0.0	0.0	0.0
<i>Heptacarpus palpator</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Metacrangon spinosissima</i>	0.0	0.0	0.0	-	-	-	0.0	0.0	0.0
<i>Neocrangon</i> sp	0.0	-	-	-	-	-	0.0	-	0.0
<i>Ophiopholis bakeri</i>	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0
<i>Ophionereis eurybrachioplax</i>	0.0	-	-	-	-	0.0	-	-	0.0
<i>Ophiacantha diplasia</i>	-	0.0	0.0	-	-	-	0.0	0.0	0.0
<i>Odontaster crassus</i>	-	-	0.0	-	-	-	0.0	-	0.0
<i>Stephanauge annularis</i>	-	0.0	-	-	-	-	-	0.0	0.0
<i>Stephanauge</i> sp A	-	-	0.0	-	-	-	-	0.0	0.0
<i>Ocinebrina foveolata</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Nymphon pixellae</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Megasurcula carpenteriana</i>	0.0	0.0	-	-	-	0.0	-	0.0	0.0
<i>Neosimnia barbarensis</i>	0.0	0.0	0.0	-	-	0.0	-	-	0.0
<i>Henricia leviuscula</i>	0.0	-	0.0	-	0.0	0.0	-	-	0.0
<i>Neocrangon communis</i>	0.0	-	-	-	-	-	0.0	-	0.0
<i>Strongylocentrotus purpuratus</i>	0.0	-	-	-	0.0	-	-	-	0.0
<i>Musculista senhousia</i>	-	-	0.0	0.0	-	-	-	-	0.0
<i>Muricea californica</i>	0.0	-	0.0	-	0.0	0.0	-	-	0.0
<i>Moloha faxoni</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Mitra idae</i>	-	-	0.0	-	-	0.0	-	-	0.0
<i>Xestospongia edapha</i>	0.0	-	-	-	-	0.0	-	-	0.0
<i>Styela</i> sp	-	0.0	0.0	-	-	0.0	-	-	0.0
<i>Neosimnia loebbeckeana</i>	-	0.0	0.0	-	-	0.0	-	-	0.0
Composite weight - Invertebrates	12.2	4.17	1.85	0.6	1.45	3.06	1.55	11.55	18.21
Total	1209.3	271.3	647.6	145.9	18.5	200.3	270.0	1493.4	2128.0

*See Appendix E for common names of invertebrate species

N = Northern; C = Central; S = Southern; B&H = Bays and harbors; IS = Inner shelf; MS = Middle shelf;
OS = Outer shelf; SCB = Southern California Bight