

APPENDIX D - ASSEMBLAGES

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D1. Frequency of occurrence (number of stations of demersal fish species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003.

			Site Cluster								Total Count
			1	2	7	8	6	5	4	3	
			Upper Slope	Upper Slope/ Outer Shelf	Outer/ Middle Shelf	Middle Shelf	Middle/ Inner Shelf	Inner Shelf	Inner Shelf B&H N/C	B&H C/S	
Number of Stations			18	18	49	32	20	35	20	17	209
Species Cluster	Common Name	Species									
A	roughback sculpin	<i>Chitonotus pugetensis</i>	-	-	4	27	12	10	-	-	53
	speckled sanddab	<i>Citharichthys stigmatæus</i>	-	-	5	12	15	32	14	1	79
	longfin sanddab	<i>Citharichthys xanthostigma</i>	-	-	6	30	6	19	3	-	64
	bigmouth sole	<i>Hippoglossina stomata</i>	-	3	17	25	7	14	2	-	68
	yellowchin sculpin	<i>Icelinus quadriseriatus</i>	-	-	20	31	14	15	7	-	87
	bay goby	<i>Lepidogobius lepidus</i>	-	-	10	24	3	5	5	-	47
	pygmy poacher	<i>Odontopyxis trispinosa</i>	-	1	11	15	9	2	3	-	41
	lingcod	<i>Ophiodon elongatus</i>	-	2	10	9	14	1	3	-	39
	English sole	<i>Parophrys vetulus</i>	3	4	29	19	16	18	8	-	97
	curfin sole	<i>Pleuronichthys decurrens</i>	-	-	12	1	13	9	2	-	37
	hornyhead turbot	<i>Pleuronichthys verticalis</i>	-	1	16	28	13	25	15	-	98
	California skate	<i>Raja inornata</i>	-	-	11	10	4	3	5	-	33
	California scorpionfish	<i>Scorpaena guttata</i>	-	1	6	17	5	17	1	-	47
	California tonguefish	<i>Symphurus atricaudus</i>	-	-	8	30	6	13	7	1	65
	pink seaperch	<i>Zalembeus rosaceus</i>	-	2	27	27	12	14	8	-	90
longspine combfish	<i>Zaniolepis latipinnis</i>	-	1	28	31	12	9	8	-	89	
B	Pacific argentine	<i>Argentina sialis</i>	-	3	4	12	-	-	-	-	19
	spotted cusk-eel	<i>Chilara taylori</i>	1	5	17	5	2	-	1	-	31
	Pacific sanddab	<i>Citharichthys sordidus</i>	1	12	46	32	20	17	3	-	131
	spotfin sculpin	<i>Icelinus tenuis</i>	-	-	15	-	3	-	-	-	18
	Dover sole	<i>Microstomus pacificus</i>	18	18	43	20	8	1	2	-	110
	plainfin midshipman	<i>Porichthys notatus</i>	-	8	32	20	8	4	7	-	79
	greenstriped rockfish	<i>Sebastes elongatus</i>	-	4	24	-	1	-	-	-	29
	pink rockfish	<i>Sebastes eos</i>	-	6	6	10	-	-	-	-	22
	chilipepper	<i>Sebastes goodei</i>	-	2	16	1	2	-	-	-	21
	shortbelly rockfish	<i>Sebastes jordani</i>	2	4	11	2	4	-	-	-	23
	cowcod	<i>Sebastes levis</i>	1	-	17	1	4	-	-	-	23
	stripetail rockfish	<i>Sebastes saxicola</i>	-	17	36	19	12	2	3	-	89
	halfbanded rockfish	<i>Sebastes semicinctus</i>	-	3	26	14	12	2	-	-	57
	bluespotted poacher	<i>Xeneretmus triacanthus</i>	-	1	15	-	-	-	-	-	16
	C	rex sole	<i>Glyptocephalus zachirus</i>	7	16	7	1	-	-	-	-
spotted ratfish		<i>Hydrolagus collieri</i>	1	4	4	-	-	-	-	-	9
blackbelly eelpout		<i>Lycodes pacificus</i>	1	16	14	-	-	-	-	-	31
bearded eelpout		<i>Lycodema barbatum</i>	5	8	4	-	-	-	-	-	17
slender sole		<i>Lypopsetta exilis</i>	17	18	21	-	-	-	-	-	56
Pacific hake		<i>Merluccius productus</i>	13	15	4	-	-	-	-	-	32
bluebarred prickleback		<i>Plectobanchus evides</i>	-	9	6	-	-	-	-	-	15
splitnose rockfish		<i>Sebastes diploproa</i>	13	14	-	1	-	-	-	-	28
greenblotched rockfish		<i>Sebastes rosenblatti</i>	-	5	8	-	1	1	-	-	15
blacktip poacher		<i>Xeneretmus latifrons</i>	4	14	15	-	-	-	-	-	33
shortspine combfish		<i>Zaniolepis frenata</i>	-	16	37	2	5	-	-	-	60
D	sablefish	<i>Anoplopoma fimbria</i>	10	2	1	-	-	-	-	-	13
	Pacific hagfish	<i>Eptatretus stoutii</i>	4	1	-	-	-	-	-	-	5
	dogface witch eel	<i>Facciolella equatorialis</i>	5	-	-	-	-	-	-	-	5
	bigfin eelpout	<i>Lycodes cortezianus</i>	13	3	2	-	-	-	-	-	18
	filetail cat shark	<i>Parmaturus xaniurus</i>	7	1	-	-	-	-	-	-	8
	shortspine thornyhead	<i>Sebastolobus alascanus</i>	9	3	-	-	-	-	-	-	12
	northern lampfish	<i>Stenobrachius leucopsarus</i>	11	1	-	-	-	-	-	-	12
E	slough anchovy	<i>Anchoa delicatissima</i>	-	-	-	-	-	-	-	6	6
	spotted sand bass	<i>Paralabrax maculatofasciatus</i>	-	-	-	-	-	-	-	7	7
	barred sand bass	<i>Paralabrax nebulifer</i>	-	-	-	1	-	1	1	11	14
	California halibut	<i>Paralichthys californicus</i>	-	-	1	3	2	17	7	15	45
	diamond turbot	<i>Pleuronichthys guttulatus</i>	-	-	-	-	-	2	-	9	11
	spotted turbot	<i>Pleuronichthys ritteri</i>	-	-	-	-	-	5	4	2	11
	California lizardfish	<i>Synodus lucioceps</i>	-	-	3	15	1	19	5	-	43
	round stingray	<i>Urobatis halleri</i>	-	-	-	-	-	-	-	10	10
	fantail sole	<i>Xystreureys liolepis</i>	-	-	-	6	2	11	1	-	20
F	shiner perch	<i>Cymatogaster aggregata</i>	-	-	-	-	2	5	10	3	20
	northern anchovy	<i>Engraulis mordax</i>	-	-	-	-	-	-	9	1	10
	white croaker	<i>Genyonemus lineatus</i>	-	-	-	2	1	3	13	2	21
	Pacific pompano	<i>Peprilus simillimus</i>	-	-	-	2	-	-	6	-	8
	white seaperch	<i>Phanerodon furcatus</i>	-	-	-	-	4	2	11	-	17

D1. (continued)

Appendix D1 (continued)

			Site Cluster								Total
			1	2	7	8	6	5	4	3	
			Upper Slope	Upper Slope/ Outer Shelf	Outer/ Middle Shelf	Middle Shelf	Middle/ Inner Shelf	Inner Shelf	Inner Shelf B&H N/C	B&H C/S	
Number of Stations			18	18	49	32	20	35	20	17	209
Species Cluster	Scientific Name	Common Name									
F	specklefin midshipman	<i>Porichthys myriaster</i>	-	-	-	4	1	2	12	5	24
	queenfish	<i>Seriphus politus</i>	-	-	-	-	-	1	13	1	15
G	southern spearnose poacher	<i>Agonopsis sterletus</i>	-	-	-	1	5	2	-	-	8
	bull sculpin	<i>Enophrys taurina</i>	-	-	-	-	8	-	-	-	8
	blackeye goby	<i>Rhinogobiops nicholsii</i>	-	-	1	-	4	2	-	-	7
	copper rockfish	<i>Sebastes caurinus</i>	-	-	-	-	7	2	1	-	10
	calico rockfish	<i>Sebastes dallii</i>	-	-	1	1	5	-	-	-	7
	vermillion rockfish	<i>Sebastes miniatus</i>	-	-	-	-	7	-	3	-	10

C = Central; N = Northern; S = Southern; B&H = Bays/Harbors; POTW = Publicly owned treatment work monitoring area.

D2. Frequency of occurrence (percent of stations) of demersal fish species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003. (B&H = Bays and Harbors; N = North; C = Central; S = South) Shading denotes greater than 50% occurrence.

			Site Cluster							
			1	2	7	8	6	5	4	3
			Upper Slope	Upper Slope/ Outer Shelf	Outer/ Middle Shelf	Middle Shelf	Middle/ Inner Shelf	Inner Shelf	Inner Shelf B&H N/C	B&H C/S
Number of Stations			18	18	49	32	20	35	20	17
Depth Range (m)			258-476	138-264	72-144	25-86	16-87	12-47	8-36	2-12
Species Cluster	Common Name	Scientific Name								
A	roughback sculpin	<i>Chitonotus pugetensis</i>	0	0	8	84	60	29	0	0
	speckled sanddab	<i>Citharichthys stigmatæus</i>	0	0	10	38	75	91	70	6
	longfin sanddab	<i>Citharichthys xanhostigma</i>	0	0	12	94	30	54	15	0
	bigmouth sole	<i>Hippoglossina stomata</i>	0	17	35	78	35	40	10	0
	yellowchin sculpin	<i>Icelinus quadriseriatus</i>	0	0	41	97	70	43	35	0
	bay goby	<i>Lepidogobius lepidus</i>	0	0	20	75	15	14	25	0
	pygmy poacher	<i>Odontopyxis trispinosa</i>	0	6	22	47	45	6	15	0
	lingcod	<i>Ophiodon elongatus</i>	0	11	20	28	70	3	15	0
	English sole	<i>Parophrys vetulus</i>	17	22	59	59	80	51	40	0
	curfin sole	<i>Pleuronichthys decurrens</i>	0	0	24	3	65	26	10	0
	hornyhead turbot	<i>Pleuronichthys verticalis</i>	0	6	33	88	65	71	75	0
	California skate	<i>Raja inornata</i>	0	0	22	31	20	9	25	0
	California scorpionfish	<i>Scorpaena guttata</i>	0	6	12	53	25	49	5	0
	California tonguefish	<i>Symphurus atricaudus</i>	0	0	16	94	30	37	35	6
	pink seaperch	<i>Zalemibus rosaceus</i>	0	11	55	84	60	40	40	0
B	longspine combfish	<i>Zaniolepis latipinnis</i>	0	6	57	97	60	26	40	0
	Pacific argentine	<i>Argentina sialis</i>	0	17	8	38	0	0	0	0
	spotted cusk-eel	<i>Chilara taylori</i>	6	28	35	16	10	0	5	0
	Pacific sanddab	<i>Citharichthys sordidus</i>	6	67	94	100	100	49	15	0
	spotfin sculpin	<i>Icelinus tenuis</i>	0	0	31	0	15	0	0	0
	Dover sole	<i>Microstomus pacificus</i>	100	100	88	63	40	3	10	0
	plainfin midshipman	<i>Porichthys notatus</i>	0	44	65	63	40	11	35	0
	greenstriped rockfish	<i>Sebastes elongatus</i>	0	22	49	0	5	0	0	0
	pink rockfish	<i>Sebastes eos</i>	0	33	12	31	0	0	0	0
	chilipepper	<i>Sebastes goodei</i>	0	11	33	3	10	0	0	0
	shortbelly rockfish	<i>Sebastes jordani</i>	11	22	22	6	20	0	0	0
	cowcod	<i>Sebastes levis</i>	6	0	35	3	20	0	0	0
	stripetail rockfish	<i>Sebastes saxicola</i>	0	94	73	59	60	6	15	0
	halfbanded rockfish	<i>Sebastes semicinctus</i>	0	17	53	44	60	6	0	0
	bluespotted poacher	<i>Xeneretmus triacanthus</i>	0	6	31	0	0	0	0	0
C	rex sole	<i>Glyptocephalus zachirus</i>	39	89	14	3	0	0	0	0
	spotted ratfish	<i>Hydrolagus collieri</i>	6	22	8	0	0	0	0	0
	blackbelly eelpout	<i>Lycodes pacificus</i>	6	89	29	0	0	0	0	0
	bearded eelpout	<i>Lycinema barbatum</i>	28	44	8	0	0	0	0	0
	slender sole	<i>Lyopsetta exilis</i>	94	100	43	0	0	0	0	0
	Pacific hake	<i>Merluccius productus</i>	72	83	8	0	0	0	0	0
	bluebarred prickleback	<i>Plectobanchus evides</i>	0	50	12	0	0	0	0	0
	splitnose rockfish	<i>Sebastes diploproa</i>	72	78	0	3	0	0	0	0
	greenblotched rockfish	<i>Sebastes rosenblatti</i>	0	28	16	0	5	3	0	0
	blacktip poacher	<i>Xeneretmus latifrons</i>	22	78	31	0	0	0	0	0
	shortspine combfish	<i>Zaniolepis frenata</i>	0	89	76	6	25	0	0	0
D	sablefish	<i>Anoplopoma fimbria</i>	56	11	2	0	0	0	0	0
	Pacific hagfish	<i>Eptatretus stoutii</i>	22	6	0	0	0	0	0	0
	dogface witch eel	<i>Facciolella equatorialis</i>	28	0	0	0	0	0	0	0
	bigfin eelpout	<i>Lycodes cortezianus</i>	72	17	4	0	0	0	0	0
	filetail cat shark	<i>Parmaturus xaniurus</i>	39	6	0	0	0	0	0	0
	shortspine thornyhead	<i>Sebastolobus alascanus</i>	50	17	0	0	0	0	0	0
	northern lampfish	<i>Stenobranchius leucopsarus</i>	61	6	0	0	0	0	0	0
E	slough anchovy	<i>Anchoa delicatissima</i>	0	0	0	0	0	0	0	35
	spotted sand bass	<i>Paralabrax maculatofasciatus</i>	0	0	0	0	0	0	0	41
	barred sand bass	<i>Paralabrax nebulifer</i>	0	0	0	3	0	3	5	65
	California halibut	<i>Paralichthys californicus</i>	0	0	2	9	10	49	35	88
	diamond turbot	<i>Pleuronichthys guttulatus</i>	0	0	0	0	0	6	0	53
	spotted turbot	<i>Pleuronichthys ritteri</i>	0	0	0	0	0	14	20	12
	California lizardfish	<i>Synodus lucioceps</i>	0	0	6	47	5	54	25	0
	round stingray	<i>Urobatis halleri</i>	0	0	0	0	0	0	0	59
	fantail sole	<i>Xystreurys liolepis</i>	0	0	0	19	10	31	5	0

D2. (continued)

			Site Cluster								
			1	2	7	8	6	5	4	3	
			Upper Slope	Upper Slope/ Outer Shelf	Outer/ Middle Shelf	Middle Shelf	Middle/ Inner Shelf	Inner Shelf	Inner Shelf B&H N/C	B&H C/S	
Number of Stations			18	18	49	32	20	35	20	17	
Depth Range (m)			258-476	138-264	72-144	25-86	16-87	12-47	8-36	2-12	
Species	Cluster	Common Name	Scientific Name								
F		shiner perch	<i>Cymatogaster aggregata</i>	0	0	0	0	10	14	50	18
		northern anchovy	<i>Engraulis mordax</i>	0	0	0	0	0	0	45	6
		white croaker	<i>Genyonemus lineatus</i>	0	0	0	6	5	9	65	12
		Pacific pompano	<i>Peprilus simillimus</i>	0	0	0	6	0	0	30	0
		white seaperch	<i>Phanerodon furcatus</i>	0	0	0	0	20	6	55	0
		specklefin midshipman	<i>Porichthys myriaster</i>	0	0	0	13	5	6	60	29
		queenfish	<i>Seriphus politus</i>	0	0	0	0	0	3	65	6
G		southern spearnose poacher	<i>Agonopsis sterletus</i>	0	0	0	3	25	6	0	0
		bull sculpin	<i>Enophrys taurina</i>	0	0	0	0	40	0	0	0
		blackeye goby	<i>Rhinogobiops nicholsii</i>	0	0	2	0	20	6	0	0
		copper rockfish	<i>Sebastes caurinus</i>	0	0	0	0	35	6	5	0
		calico rockfish	<i>Sebastes dallii</i>	0	0	2	3	25	0	0	0
		vermillion rockfish	<i>Sebastes miniatus</i>	0	0	0	0	35	0	15	0

C = Central; N = Northern; S = Southern; B&H = Bays/Harbors; POTW = Publicly owned treatment work monitoring area.

D3. Abundance of demersal fish species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003.

Species Cluster	Common Name	Scientific Name	Site Cluster								Total Count	
			1	2	7	8	6	5	4	3		
			Upper Slope	Upper Slope/ Outer Shelf	Outer/ Middle Shelf	Middle Shelf	Middle/ Inner Shelf	Inner Shelf	Inner Shelf B&H N/C	B&H C/S		
			Number of Stations									
			18	18	49	32	20	35	20	17	209	
A	roughback sculpin	<i>Chitonotus pugetensis</i>	-	-	9	352	98	57	-	-	516	
	speckled sanddab	<i>Citharichthys stigmaeus</i>	-	-	219	1,551	2,143	2,646	222	4	6,785	
	longfin sanddab	<i>Citharichthys xanthostigma</i>	-	-	10	742	43	451	10	-	1,256	
	bigmouth sole	<i>Hippoglossina stomata</i>	-	4	28	72	10	36	6	-	156	
	yellowchin sculpin	<i>Icelinus quadriseriatus</i>	-	-	511	2,559	369	238	285	-	3,962	
	bay goby	<i>Lepidogobius lepidus</i>	-	-	42	256	30	27	101	-	456	
	pygmy poacher	<i>Odontopyxis trispinosa</i>	-	1	30	47	26	3	6	-	113	
	lingcod	<i>Ophiodon elongatus</i>	-	2	29	12	42	1	14	-	100	
	English sole	<i>Parophrys vetulus</i>	5	7	381	104	118	118	92	-	825	
	curlfin sole	<i>Pleuronichthys decurrens</i>	-	-	67	2	253	31	8	-	361	
	hornyhead turbot	<i>Pleuronichthys verticalis</i>	-	1	82	182	49	108	62	-	484	
	California skate	<i>Raja inornata</i>	-	-	19	16	5	3	21	-	64	
	California scorpionfish	<i>Scorpaena guttata</i>	-	1	15	67	16	68	1	-	168	
	California tonguefish	<i>Symphurus atricaudus</i>	-	-	48	341	23	81	60	4	557	
	pink seaperch	<i>Zalemmbius rosaceus</i>	-	2	121	304	133	175	557	-	1,292	
	longspine combfish	<i>Zaniolepis latipinnis</i>	-	1	1,363	1,368	156	52	119	-	3,059	
B	Pacific argentine	<i>Argentina sialis</i>	-	3	5	193	-	-	-	-	201	
	spotted cusk-eel	<i>Chilara taylori</i>	1	13	158	9	4	-	1	-	186	
	Pacific sanddab	<i>Citharichthys sordidus</i>	2	356	10,192	4,068	1,711	711	18	-	17,058	
	spotfin sculpin	<i>Icelinus tenuis</i>	-	-	80	-	23	-	-	-	103	
	Dover sole	<i>Microstomus pacificus</i>	240	485	1,200	168	134	1	8	-	2,236	
	plainfin midshipman	<i>Porichthys notatus</i>	-	123	374	156	45	4	56	-	758	
	greenstriped rockfish	<i>Sebastes elongatus</i>	-	9	110	-	1	-	-	-	120	
	pink rockfish	<i>Sebastes eos</i>	-	7	35	21	-	-	-	-	63	
	chilipepper	<i>Sebastes goodei</i>	-	2	228	1	12	-	-	-	243	
	shortbelly rockfish	<i>Sebastes jordani</i>	5	13	283	7	30	-	-	-	338	
	cowcod	<i>Sebastes levis</i>	2	-	52	1	14	-	-	-	69	
	stripetail rockfish	<i>Sebastes saxicola</i>	-	1,538	1,597	267	381	6	68	-	3,857	
	halfbanded rockfish	<i>Sebastes semicinctus</i>	-	26	400	118	2,145	3	-	-	2,692	
	bluespotted poacher	<i>Xeneretmus triacanthus</i>	-	1	45	-	-	-	-	-	46	
	C	rex sole	<i>Glyptocephalus zachirus</i>	31	450	11	1	-	-	-	-	493
		spotted ratfish	<i>Hydrolagus collii</i>	1	6	8	-	-	-	-	-	15
blackbelly eelpout		<i>Lycodes pacificus</i>	2	689	55	-	-	-	-	-	746	
bearded eelpout		<i>Lyconema barbatum</i>	34	222	6	-	-	-	-	-	262	
slender sole		<i>Lyopsetta exilis</i>	457	3,751	351	-	-	-	-	-	4,559	
Pacific hake		<i>Merluccius productus</i>	166	61	4	-	-	-	-	-	231	
bluebarred prickleback		<i>Plectobranchius evides</i>	-	57	9	-	-	-	-	-	66	
splitnose rockfish		<i>Sebastes diploproa</i>	98	1,150	-	1	-	-	-	-	1,249	
greenblotched rockfish		<i>Sebastes rosenblatti</i>	-	13	68	-	1	1	-	-	83	
blacktip poacher		<i>Xeneretmus latifrons</i>	9	213	164	-	-	-	-	-	386	
shortspine combfish		<i>Zaniolepis frenata</i>	-	373	695	3	84	-	-	-	1,155	
D		sablefish	<i>Anoplopoma fimbria</i>	35	2	1	-	-	-	-	-	38
		Pacific hagfish	<i>Eptatretus stoutii</i>	9	1	-	-	-	-	-	-	10
		dogface witch eel	<i>Facciolella equatorialis</i>	33	-	-	-	-	-	-	-	33
		bigfin eelpout	<i>Lycodes corteziensis</i>	61	9	2	-	-	-	-	-	72
		filetail cat shark	<i>Parmaturus xaniurus</i>	11	1	-	-	-	-	-	-	12
	shortspine thornyhead	<i>Sebastolobus alascanus</i>	163	13	-	-	-	-	-	-	176	
	northern lampfish	<i>Stenobranchius leucopsarus</i>	55	1	-	-	-	-	-	-	56	
	E	slough anchovy	<i>Anchoa delicatissima</i>	-	-	-	-	-	-	-	362	362
spotted sand bass		<i>Paralabrax maculatofasciatus</i>	-	-	-	-	-	-	-	18	18	
barred sand bass		<i>Paralabrax nebulifer</i>	-	-	-	1	-	1	1	118	121	
California halibut		<i>Paralichthys californicus</i>	-	-	2	3	3	46	43	101	198	
diamond turbot		<i>Pleuronichthys guttulatus</i>	-	-	-	-	-	3	-	26	29	
spotted turbot		<i>Pleuronichthys ritteri</i>	-	-	-	-	-	16	5	12	33	
California lizardfish		<i>Synodus lucioceps</i>	-	-	3	27	6	80	37	-	153	
round stingray		<i>Urobatis halleri</i>	-	-	-	-	-	-	-	252	252	
F	fantail sole	<i>Xystreurys liolepis</i>	-	-	-	15	3	23	1	-	42	
	shiner perch	<i>Cymatogaster aggregata</i>	-	-	-	-	5	16	224	12	257	
	northern anchovy	<i>Engraulis mordax</i>	-	-	-	-	-	-	141	4	145	
	white croaker	<i>Genyonemus lineatus</i>	-	-	-	2	2	9	809	34	856	
	Pacific pompano	<i>Peprilus simillimus</i>	-	-	-	2	-	-	19	-	21	
	white seaperch	<i>Phanerodon furcatus</i>	-	-	-	-	14	2	150	-	166	

D3. (continued)

			Site Cluster								Total Count
			1	2	7	8	6	5	4	3	
			Upper Slope	Upper Slope/ Outer Shelf	Outer/ Middle Shelf	Middle Shelf	Middle/ Inner Shelf	Inner Shelf	Inner Shelf B&H N/C	B&H C/S	
			Number of Stations	18	18	49	32	20	35	20	17
Species Cluster	Common Name	Scientific Name									
F	specklefin midshipman	<i>Porichthys myriaster</i>	-	-	-	10	1	3	130	40	184
	queenfish	<i>Seriophus politus</i>	-	-	-	-	-	1	80	186	267
G	southern spearnose poacher	<i>Agonopsis sterletus</i>	-	-	-	1	16	2	-	-	19
	bull sculpin	<i>Enophrys taurina</i>	-	-	-	-	50	-	-	-	50
	blackeye goby	<i>Rhinogobiops nicholsii</i>	-	-	1	-	52	2	-	-	55
	copper rockfish	<i>Sebastes caurinus</i>	-	-	-	-	63	2	2	-	67
	calico rockfish	<i>Sebastes dallii</i>	-	-	1	1	21	-	-	-	23
	vermillion rockfish	<i>Sebastes miniatus</i>	-	-	-	-	16	-	3	-	19

C = Central; N = Northern; S = Southern; B&H = Bays/Harbors; POTW = Publicly owned treatment work monitoring area.

Group 1 "tunicate" (<i>Ascidacea</i> sp SD2) "tunicate" (<i>Ascidacea</i> sp SD4) "tunicate" (<i>Ascidacea</i> sp SD5) "tunicate" (<i>Ascidacea</i> sp SD6)	Group 4 "sponge" (<i>Porifera</i> sp SD2) "tunicate" (<i>Ascidacea</i> sp SD7)
Group 5 shag-rug aeolis (<i>Aeolidia papillosa</i>) knobknee crestleg crab (<i>Lophopaneopeus leucomanus</i>) giant chorus snail (<i>Forreria belcheri</i>) spaghetti moss-animal (<i>Zoobotryon verticillatum</i>)	Group 7 "sponge" (<i>Porifera</i> sp SD15) spiny cup-and-saucer (<i>Crucibulum spinosum</i>)
Group 9 "hermit" (<i>Paguristes</i> sp HYP1) "seabristle" (<i>Plumularia</i> sp) Hemphill kelp crab (<i>Podocheila hemphillii</i>)	Group 8 "bryozoan" (<i>Thalamoporella</i> sp) innkeeper pea crab (<i>Pinnixa franciscana</i>)
Group 11 tricolor topsnail (<i>Calliostoma tricolor</i>) purple sea hare (<i>Aplysia californica</i>) molarless crestleg crab (<i>Lophopaneopeus frontalis</i>)	Group 10 Taylor coastal shrimp (<i>Heptacarpus taylori</i>) "kelp isopod" (<i>Pentidotea resecata</i>)
Group 13 "sea cucumber" (<i>Psolidium</i> sp SD1) Olyroyd coralsnail (<i>Babelomurex oldroydi</i>) "nudibranch" (<i>Platydoris</i> sp) olive snapping shrimp (<i>Alpheus bellimanus</i>) rock oyster or jingle shell (<i>Pododesmus macrochisma</i>) two-tooth topsnail (<i>Turcica caffee</i>)	Group 12 Pacific wing-oyster (<i>Pteria sterna</i>) secret jewelbox (<i>Chama arcana</i>)
Group 16 globose kelp crab (<i>Taliepus nuttallii</i>) granulose topsnail (<i>Calliostoma supragranosum</i>)	Group 14 giant rock scallop (<i>Crassadoma gigantea</i>) glorious topsnail (<i>Calliostoma gloriosum</i>)
	Group 15 San Diego lamellaria (<i>Lamellaria diegoensis</i>) lumpy rubble crab (<i>Paraxanthias taylori</i>)
	Group 17 "bryozoan" (<i>Cellaria mandibulata</i>) "bryozoan" (<i>Hippopodina californica</i>) fluted bryozoan (<i>Hippodiplosia insculpta</i>) Hudson spiny doris (<i>Acanthodoris hudsoni</i>)

D4. Recurrent groups of megabenthic invertebrates found at single sites on the southern California shelf at depths of 2-476 m, July-October 2003. Index of affinity listed in order of abundance. Lines show relationships between groups and associates, with values indicating proportion of possible pairs with I.A. = 0.5 (0.495).

Group 20

spiny scallop (*Chlamys hastata*)
 flatspine brittlestar (*Ophiopertis papillosa*)
 "gastropod" (*Trivia ritteri*)
 appleseed erato (*Erato vitellina*)

Group 22

"bryozoan" (*Schizoporella inarmata*)
 "hydroid" (*Abietinaria sp*)
 fleshy sea pen (*Ptilosarcus gurneyi*)

Group 25

"sea cucumber" (*Psolidium sp*)
 "sea squirt" (*Bathypera feminalba*)
 "sea star" (*Henricia aspera*)
 "tunicate" (*Molgula regularis*)

Group 32

Cooper's nutmeg (*Cancellaria cooperii*)
 luminescent zoanthid (*Epizoanthus induratus*)

Group 33

"isopod" (*Aega lecontii*)
 Ida's miter (*Mitra idae*)

Group 38

feather boa sea pen (*Anthoptilum grandiflorum*)
 spiny red star (*Hippasteria spinosa*)

Group 21

foliate kelp crab (*Mimulus foliatus*)
 festive murex (*Pteropurpura festiva*)
 holdfast brittlestar (*Amphipholis squamata*)

Group 24

"sea fan" (*Euplexaura sp*)
 "zoanthid" (*Zooanthidae sp B*)
 gray puffball sponge (*Tetilla arb*)

Group 27

"lamp shell" (*Terebratulina unguicula*)
 Stearns turrid (*Megasurcula stearnsiana*)

Group 29

red lamp shell (*Terebratalia transversa*)
 barrel snail (*Rictaxis painei*)
 "trophon" (*Scabrotrophon grovesi*)

Group 34

white lamp shell (*Terebratulina crosseii*)
 "sea star" (*Odontaster crassus*)
 California squat lobster (*Galathea californiensis*)
 silvery topsnail (*Calliostoma platinum*)

Group 40

"sea star" (*Thrissacanthias penicillatus*)
 "squat lobster" (*Munidopsis depressa*)

D4. (continued)

D5. Frequency of occurrence (number of stations) of megabenthic invertebrate species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003.

			Site Cluster									Total Count
			2	1	5	9	4	8	3	6	7	
			Upper Slope	Upper Slope/ Outer Shelf	Outer Shelf	Middle Shelf	Channel Islands/ Middle Shelf	Inner/ Middle Shelf	Inner Shelf	B&H Central	B&H South	
Invertebrates			15	13	22	48	22	46	14	9	6	195
Species Cluster	Common Name	Species	Number of Stations									
A	yellow-green sea squirt	<i>Ciona intestinalis</i>	-	-	-	-	-	-	-	-	5	5
	warty tunicate	<i>Molgula verrucifera</i>	-	-	-	-	-	-	-	1	3	4
	mat mussel	<i>Musculista senhousia</i>	-	-	-	-	-	-	-	5	2	7
	California aglaja	<i>Navanax inermis</i>	-	-	-	-	-	-	-	7	4	11
	cobblestone sea squirt	<i>Styela plicata</i>	-	-	-	-	-	-	-	5	2	7
B	Pacific calico scallop	<i>Argopecten ventricosus</i>	-	-	-	-	-	-	-	7	-	7
	kelp scallop	<i>Leptopecten latiauratus</i>	-	-	-	-	-	-	-	6	2	8
	mussel	<i>Mytilus</i> sp	-	-	-	-	-	1	-	5	-	6
	tuberculate sea squirt	<i>Styela clava</i>	-	-	-	-	2	-	-	3	-	5
C	trallip sea pen	<i>Acanthoptilum</i> sp	1	-	5	28	17	14	1	3	-	69
	California sand star	<i>Astropecten verrilli</i>	-	-	6	41	7	29	7	-	-	90
	gray sand star	<i>Luidia foliolata</i>	1	5	7	24	16	8	-	1	-	62
	white sea urchin	<i>Lytechinus pictus</i>	-	-	4	29	18	18	1	1	-	71
	red octopus	<i>Octopus rubescens</i>	-	2	14	28	20	14	10	-	-	88
	brittle star	<i>Ophiura luetkenii</i>	-	-	8	34	15	8	-	-	-	65
	California sea cucumber	<i>Parastichopus californicus</i>	-	1	4	35	6	7	1	2	-	56
	California sea slug	<i>Pleurobranchaea californica</i>	6	9	6	14	10	4	-	-	-	49
D	brown spiny doris	<i>Acanthodoris brunnea</i>	-	-	1	14	-	4	-	1	-	20
	California armina	<i>Armina californica</i>	-	-	1	9	-	2	-	-	-	12
	Alaska bay shrimp	<i>Crangon alaskensis</i>	-	-	1	18	2	2	-	-	-	23
	California blade barnacle	<i>Hamatoscalpellum californicum</i>	-	-	-	15	5	8	1	1	-	30
	urn sponge	<i>Leucilla nuttingi</i>	-	-	-	2	-	3	-	-	-	5
	tower snail	<i>Megasurcula carpenteriana</i>	-	-	2	8	-	-	-	-	-	10
	slender sea pen	<i>Stylatula elongata</i>	-	-	1	12	2	7	-	-	-	22
	yellow sea twig	<i>Thesea</i> sp b	-	-	3	26	5	7	-	-	-	41
	sea pen	<i>Virgularia agassizi</i>	-	-	-	4	-	2	-	-	-	6
E	roughdisk brittlestar	<i>Amphichondrius granulatus</i>	-	-	1	3	4	-	-	-	-	8
	tunicates	Ascidacea	-	-	-	1	2	2	-	-	-	5
	spindle topsnail	<i>Calliostoma turbinum</i>	-	-	-	6	2	-	-	-	-	8
	icy tunicate	<i>Corella willmeriana</i>	-	-	-	-	7	-	-	-	-	7
	California frogsnail	<i>Crossata californica</i>	-	-	-	4	-	1	-	-	-	5
	feather star	<i>Florometra serratissima</i>	-	-	4	5	1	-	-	-	-	10
	blood star	<i>Henricia leviuscula</i>	-	-	-	-	5	-	-	-	-	5
	Kellett whelk	<i>Kelletia kelletii</i>	-	-	-	1	1	4	-	-	-	6
	California market squid	<i>Loligo opalescens</i>	-	2	1	12	1	8	2	-	-	26
	pink sea whip	<i>Lophogorgia chilensis</i>	-	-	-	-	1	4	-	-	-	5
	mosaic sand star	<i>Luidia armata</i>	-	-	-	5	2	3	2	-	-	12
	fringed sand star	<i>Luidia asthenosoma</i>	-	1	1	11	6	1	-	-	-	20
	red sea star	<i>Mediaster aequalis</i>	6	2	3	5	19	1	-	-	-	36
	gigantic anemone	<i>Metridium farcimen</i>	-	2	3	5	3	-	-	-	-	13
	roughspine brittlestar	<i>Ophiopholis bakeri</i>	4	1	6	3	6	-	-	-	-	20
	Pacific spiny brittlestar	<i>Ophiothrix spiculata</i>	-	1	1	12	7	14	-	1	-	36
	slenderclaw hermit	<i>Paguristes turgidus</i>	-	-	4	-	2	1	-	-	-	7
	brown cup coral	<i>Paracyathus stearnsii</i>	-	-	-	-	5	1	-	-	-	6
	white paperbubble	<i>Phyllina alba</i>	1	-	-	4	10	1	-	-	-	16
	sunflower star	<i>Pycnopodia helianthoides</i>	-	-	-	-	10	-	-	-	-	10
	banded sea star	<i>Sclerasterias heteropaes</i>	-	-	-	-	6	-	-	-	-	6
	sea-squirt	<i>Styela</i> sp	-	-	-	-	4	-	-	1	-	5
	fish-eating star	<i>Stylasterias forreri</i>	1	1	1	-	6	-	-	-	-	9
	rosy tritonia	<i>Tritonia diomedea</i>	-	-	3	5	11	2	-	-	-	21
	California sea pen	<i>Virgularia californica</i>	-	1	-	2	3	4	-	-	-	10
F	orange sand star	<i>Astropecten ornatissimus</i>	-	1	4	2	4	-	-	-	-	11
	Crawford nutmeg	<i>Cancellaria crawfordiana</i>	1	1	2	2	-	-	-	-	-	6
	Adam spiny margarite	<i>Cidarina cidaris</i>	-	-	4	-	1	-	-	-	-	5
	basket star	<i>Gorgonocephalus eucnemis</i>	-	-	6	-	-	-	-	-	-	6
	brown box crab	<i>Lopholithodes foraminatus</i>	-	1	6	-	1	-	-	-	-	8
	southern spinyhead	<i>Metacrangon spinosissima</i>	-	3	5	4	1	-	-	-	-	13
	smooth western nassa	<i>Nassarius insculptus</i>	-	-	6	1	-	-	-	-	-	7
	gray shrimp	<i>Neocrangon communis</i>	-	6	-	-	-	-	-	-	-	6
	pycnogonid	<i>Nymphon pixellae</i>	-	-	4	5	-	-	-	-	-	9
	ocean shrimp	<i>Pandalus jordani</i>	-	2	3	-	-	-	-	-	-	5
	armed box crab	<i>Platymera gaudichaudii</i>	-	-	7	5	4	5	-	-	-	21

D5. (continued)

			Site Cluster								Total Count	
			2	1	5	9	4	8	3	6		7
			Upper Slope	Upper Slope/ Outer Shelf	Outer Shelf	Middle Shelf	Channel Islands/ Middle Shelf	Inner/ Middle Shelf	Inner Shelf	B&H Central		B&H South
Invertebrates			Number of Stations									
Species Cluster	Common Name	Species	15	13	22	48	22	46	14	9	6	195
G	spiny sand star	<i>Astropecten armatus</i>	-	-	-	-	-	4	2	1	-	7
	graceful rock crab	<i>Cancer gracilis</i>	-	-	-	-	-	3	7	1	-	11
	blackspotted bay shrimp	<i>Crangon nigromaculata</i>	-	-	-	-	-	18	8	2	-	28
	Stimpson coastal shrimp	<i>Heptacarpus stimpsoni</i>	-	-	-	-	-	5	-	-	-	5
	New Zealand papperbubble	<i>Philine auriformis</i>	-	-	8	25	3	11	1	3	1	52
	shortspined sea star	<i>Pisaster brevispinus</i>	-	-	-	-	-	3	8	-	-	11
	tuberculate pear crab	<i>Pyromaia tuberculata</i>	-	-	-	2	-	7	3	8	-	20
	maculated triopha	<i>Triopha maculata</i>	-	-	-	-	3	4	-	1	-	8
H	Pacific acorn barnacle	<i>Balanus pacificus</i>	-	-	-	-	-	5	-	-	-	5
	Spanish shawl	<i>Flabellina iodinea</i>	-	-	-	-	-	9	-	-	-	9
	sandflat elbow crab	<i>Heterocrypta occidentalis</i>	-	-	-	1	1	7	-	1	-	10
	moss crab	<i>Loxorhynchus crispatus</i>	-	-	1	-	1	5	-	1	-	8
	spotwrist hermit	<i>Pagurus spilocarpus</i>	-	-	-	3	-	4	-	1	-	8
	northern kelp crab	<i>Pugettia producta</i>	-	-	-	-	-	6	-	2	1	9
I	sea mouse	<i>Aphrodita sp</i>	8	2	-	1	2	1	-	-	-	14
	ophiuroid	<i>Asteronyx longifissus</i>	8	1	-	-	-	-	-	-	-	9
	sea pen	<i>Halipteris californica</i>	5	-	1	1	-	1	-	-	-	8
	sea star	<i>Myxoderma platyacanthum</i>	10	1	-	-	-	-	-	-	-	11
	holothuroid	<i>Pannychia moseleyi</i>	11	1	-	-	-	-	-	-	-	12
	sponge	<i>Porifera</i>	7	1	1	3	6	2	1	5	-	26
	sea star	<i>Pseudarchaster pusillus</i>	6	1	-	-	-	-	-	-	-	7
	signet ring anemone	<i>Stephanauge annularis</i>	4	1	-	1	-	-	-	-	-	6
J	northern heart urchin	<i>Brisaster latifrons</i>	11	12	4	-	2	-	-	-	-	29
	orange bigeye octopus	<i>Octopus californicus</i>	10	12	3	1	-	-	-	-	-	26
	California heart urchin	<i>Spatangia californicus</i>	5	13	5	-	2	1	-	-	-	26
	offshore blade shrimp	<i>Spirontocaris sica</i>	10	9	1	-	-	-	-	-	-	20
K	fragile sea urchin	<i>Allocentrotus fragilis</i>	7	13	18	3	7	2	-	-	-	50
	Pacific heart urchin	<i>Brissopsis pacifica</i>	5	10	6	-	4	-	-	-	-	25
	sea dandelion	<i>Dromalia alexandri</i>	4	9	4	-	-	-	-	-	-	17
	flagnose bay shrimp	<i>Neocrangon resima</i>	-	6	9	-	2	-	-	-	-	17
	moustache bay shrimp	<i>Neocrangon zacae</i>	-	9	15	2	2	1	-	-	-	29
	spot shrimp	<i>Pandalus platyceros</i>	2	5	2	6	3	6	-	-	-	24
	eastern Pacific bobtail	<i>Rossia pacifica</i>	3	8	11	21	4	5	-	-	-	52
	ridgeback rock shrimp	<i>Sicyonia ingentis</i>	-	4	14	20	8	4	-	-	-	50
	slender blade shrimp	<i>Spirontocaris holmesi</i>	3	7	6	-	-	-	-	-	-	16

B&H = Bays and Harbors

D6. Frequency of occurrence (percent of stations) of megabenthic invertebrate species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October. Shading denotes greater than 50% occurrence.

			Site Cluster								
			2	1	5	9	4	8	3	6	7
			Upper Slope	Upper Slope/ Outer Shelf	Outer Shelf	Middle Shelf	Channel Islands/ Middle Shelf	Inner/ Middle Shelf	Inner Shelf	B&H Central	B&H South
			15	13	22	48	22	46	14	9	6
			225-476	192-377	120-202	28-138	52-132	25-86	12-28	2-25	4-12
Species Cluster	Common Name	Scientific Name									
A	yellow-green sea squirt	<i>Ciona intestinalis</i>	--	--	--	--	--	--	--	--	83
	warty tunicate	<i>Molgula verrucifera</i>	--	--	--	--	--	--	--	11	50
	mat mussel	<i>Musculista senhousia</i>	--	--	--	--	--	--	--	56	33
	California aglaja	<i>Navanax inermis</i>	--	--	--	--	--	--	--	78	67
	cobblestone sea squirt	<i>Styela plicata</i>	--	--	--	--	--	--	--	56	33
B	Pacific calico scallop	<i>Argopecten ventricosus</i>	--	--	--	--	--	--	--	78	--
	kelp scallop	<i>Leptopecten latiauratus</i>	--	--	--	--	--	--	--	67	33
	mussel	<i>Mytilus sp</i>	--	--	--	--	--	2	--	56	--
	tuberculate sea squirt	<i>Styela clava</i>	--	--	--	--	9	--	--	33	--
C	trilip sea pen	<i>Acanthoptilum sp</i>	7	--	23	58	77	30	7	33	--
	California sand star	<i>Astropecten verrilli</i>	--	--	27	85	32	63	50	--	--
	gray sand star	<i>Luidia foliolata</i>	7	38	32	50	73	17	--	11	--
	white sea urchin	<i>Lytechinus pictus</i>	--	--	18	60	82	39	7	11	--
	red octopus	<i>Octopus rubescens</i>	--	15	64	58	91	30	71	--	--
	brittle star	<i>Ophiura luetkenii</i>	--	--	36	71	68	17	--	--	--
	California sea cucumber	<i>Parastichopus californicus</i>	--	--	8	73	27	15	7	22	--
	California sea slug	<i>Pleurobranchaea californica</i>	40	69	27	29	45	9	--	--	--
D	brown spiny doris	<i>Acanthodoris brunnea</i>	--	--	5	29	--	9	--	11	--
	California armina	<i>Armina californica</i>	--	--	5	19	--	4	--	--	--
	Alaska bay shrimp	<i>Crangon alaskensis</i>	--	--	5	38	9	4	--	--	--
	California blade barnacle	<i>Hamatoscalpellum californicum</i>	--	--	--	31	23	17	7	11	--
	urn sponge	<i>Leucilla nuttingi</i>	--	--	--	4	--	7	--	--	--
	tower snail	<i>Megasurcula carpenteriana</i>	--	--	9	17	--	--	--	--	--
	slender sea pen	<i>Stylatula elongata</i>	--	--	5	25	9	15	--	--	--
	yellow sea twig	<i>Thessea sp b</i>	--	--	14	54	23	15	--	--	--
	sea pen	<i>Virgularia agassizi</i>	--	--	--	8	--	4	--	--	--
	roughdisk brittlestar	<i>Amphichondrius granulatus</i>	--	--	5	6	18	--	--	--	--
E	tunicates	Ascidacea	--	--	--	2	9	4	--	--	--
	spindle topsnail	<i>Calliostoma turbinum</i>	--	--	--	13	9	--	--	--	--
	icy tunicate	<i>Corella willmeriana</i>	--	--	--	--	32	--	--	--	--
	California frogsnail	<i>Crossata californica</i>	--	--	--	8	--	2	--	--	--
	feather star	<i>Florometra serratissima</i>	--	--	18	10	5	--	--	--	--
	blood star	<i>Henricia leviuscula</i>	--	--	--	--	23	--	--	--	--
	Kellet whelk	<i>Kelletia kelleitii</i>	--	--	--	2	5	9	--	--	--
	California market squid	<i>Loligo opalescens</i>	--	15	5	25	5	17	14	--	--
	pink sea whip	<i>Lophogorgia chilensis</i>	--	--	--	--	5	9	--	--	--
	mosaic sand star	<i>Luidia armata</i>	--	--	--	10	9	7	14	--	--
	fringed sand star	<i>Luidia asthenosoma</i>	--	8	5	23	27	2	--	--	--
F	red sea star	<i>Mediaster aequalis</i>	40	15	14	10	86	2	--	--	--
	gigantic anemone	<i>Metridium farcimen</i>	--	15	14	10	14	--	--	--	--
	roughspine brittlestar	<i>Ophiopholis bakeri</i>	27	8	27	6	27	--	--	--	--
	Pacific spiny brittlestar	<i>Ophiothrix spiculata</i>	--	8	5	25	32	30	--	11	--
	slenderclaw hermit	<i>Paguristes turgidus</i>	--	--	18	--	9	2	--	--	--
	brown cup coral	<i>Paracyathus stearnsii</i>	--	--	--	--	23	2	--	--	--
	white paperbubble	<i>Philine alba</i>	7	--	--	8	45	2	--	--	--
	sunflower star	<i>Pycnopodia helianthoides</i>	--	--	--	--	45	--	--	--	--
	banded sea star	<i>Sclerasterias heteropaes</i>	--	--	--	--	27	--	--	--	--
	sea-squirt	<i>Styela sp</i>	--	--	--	--	18	--	--	11	--
	fish-eating star	<i>Stylasterias forreri</i>	7	8	5	--	27	--	--	--	--
	rosy tritonia	<i>Tritonia diomedea</i>	--	--	14	10	50	4	--	--	--
F	California sea pen	<i>Virgularia californica</i>	--	8	--	4	14	9	--	--	--
	orange sand star	<i>Astropecten ornatissimus</i>	--	8	18	4	18	--	--	--	--
	Crawford nutmeg	<i>Cancellaria crawfordiana</i>	7	8	9	4	--	--	--	--	--
	Adam spiny margarite	<i>Cidarina cidaris</i>	--	--	18	--	5	--	--	--	--
	basket star	<i>Gorgonocephalus eucnemis</i>	--	--	27	--	--	--	--	--	--
	brown box crab	<i>Lopholithodes foraminatus</i>	--	8	27	--	5	--	--	--	--
	southern spinyhead	<i>Metacrangon spinosissima</i>	--	23	23	8	5	--	--	--	--
	smooth western nassa	<i>Nassarius insculptus</i>	--	--	27	2	--	--	--	--	--
	gray shrimp	<i>Neocrangon communis</i>	--	46	--	--	--	--	--	--	--
F	pycnogonid	<i>Nymphon pixellae</i>	--	--	18	10	--	--	--	--	--
	ocean shrimp	<i>Pandalus jordani</i>	--	15	14	--	--	--	--	--	--

D6. (continued)

			Site Cluster								
			2	1	5	9	4	8	3	6	7
			Upper Slope	Upper Slope/ Outer Shelf	Outer Shelf	Middle Shelf	Channel Islands/ Middle Shelf	Inner/ Middle Shelf	Inner Shelf	B&H Central	B&H South
Invertebrates			15	13	22	48	22	46	14	9	6
Number of Stations			225-476	192-377	120-202	28-138	52-132	25-86	12-28	2-25	4-12
Depth Range (m)											
Species Cluster	Common Name	Scientific Name									
G	spiny sand star	<i>Astropecten armatus</i>	--	--	--	--	--	9	14	11	--
	graceful rock crab	<i>Cancer gracilis</i>	--	--	--	--	--	7	50	11	--
	blackspotted bay shrimp	<i>Crangon nigromaculata</i>	--	--	--	--	--	39	57	22	--
	Stimpson coastal shrimp	<i>Heptacarpus stimpsoni</i>	--	--	--	--	--	11	--	--	--
	New Zealand papperbubble	<i>Philine auriformis</i>	--	--	36	52	14	24	7	33	17
	shortspined sea star	<i>Pisaster brevispinus</i>	--	--	--	--	--	7	57	--	--
	tuberculate pear crab	<i>Pyromaia tuberculata</i>	--	--	--	4	--	15	21	89	--
	maculated triopha	<i>Triopha maculata</i>	--	--	--	--	14	9	--	11	--
H	Pacific acorn barnacle	<i>Paraconcavas pacificus</i>	--	--	--	--	--	11	--	--	--
	Spanish shawl	<i>Flabellina iodinea</i>	--	--	--	--	--	20	--	--	--
	sandflat elbow crab	<i>Heterocrypta occidentalis</i>	--	--	--	2	5	15	--	11	--
	moss crab	<i>Loxorhynchus crispatus</i>	--	--	5	--	5	11	--	11	--
	spotwrist hermit	<i>Pagurus spilocarpus</i>	--	--	--	6	--	9	--	11	--
	northern kelp crab	<i>Pugettia producta</i>	--	--	--	--	--	13	--	22	17
I	sea mouse	<i>Aphrodita sp</i>	53	15	--	2	9	2	--	--	--
	ophiurid	<i>Asteronyx longifissus</i>	53	8	--	--	--	--	--	--	--
	sea pen	<i>Halipteris californica</i>	33	--	5	2	--	2	--	--	--
	sea star	<i>Myxoderma platyacanthum</i>	67	8	--	--	--	--	--	--	--
	holothuroid	<i>Pannychia moseleyi</i>	73	8	--	--	--	--	--	--	--
	sponge	<i>Porifera</i>	47	8	5	6	27	4	7	56	--
	sea star	<i>Pseudarchaster pusillus</i>	40	8	--	--	--	--	--	--	--
	signet ring anemone	<i>Stephanauge annularis</i>	27	8	--	2	--	--	--	--	--
J	northern heart urchin	<i>Brisaster latifrons</i>	73	92	18	--	9	--	--	--	--
	orange bigeye octopus	<i>Octopus californicus</i>	67	92	14	2	--	--	--	--	--
	California heart urchin	<i>Spatangus californicus</i>	33	100	23	--	9	2	--	--	--
	offshore blade shrimp	<i>Spirontocaris sica</i>	67	69	5	--	--	--	--	--	--
K	fragile sea urchin	<i>Allocentrotus fragilis</i>	47	100	82	6	32	4	--	--	--
	Pacific heart urchin	<i>Brissopsis pacifica</i>	33	77	27	--	18	--	--	--	--
	sea dandelion	<i>Dromalia alexandri</i>	27	69	18	--	--	--	--	--	--
	flagnose bay shrimp	<i>Neocrangon resima</i>	--	46	41	--	9	--	--	--	--
	moustache bay shrimp	<i>Neocrangon zacae</i>	--	69	68	4	9	2	--	--	--
	spot shrimp	<i>Pandalus platyceros</i>	13	38	9	13	14	13	--	--	--
	eastern Pacific bobtail	<i>Rossia pacifica</i>	20	62	50	44	18	11	--	--	--
	ridgeback rock shrimp	<i>Sicyonia ingentis</i>	--	31	64	42	36	9	--	--	--
	slender blade shrimp	<i>Spirontocaris holmesi</i>	20	54	27	--	--	--	--	--	--

B&H = Bays and Harbors; N = North; C = Central; S = South

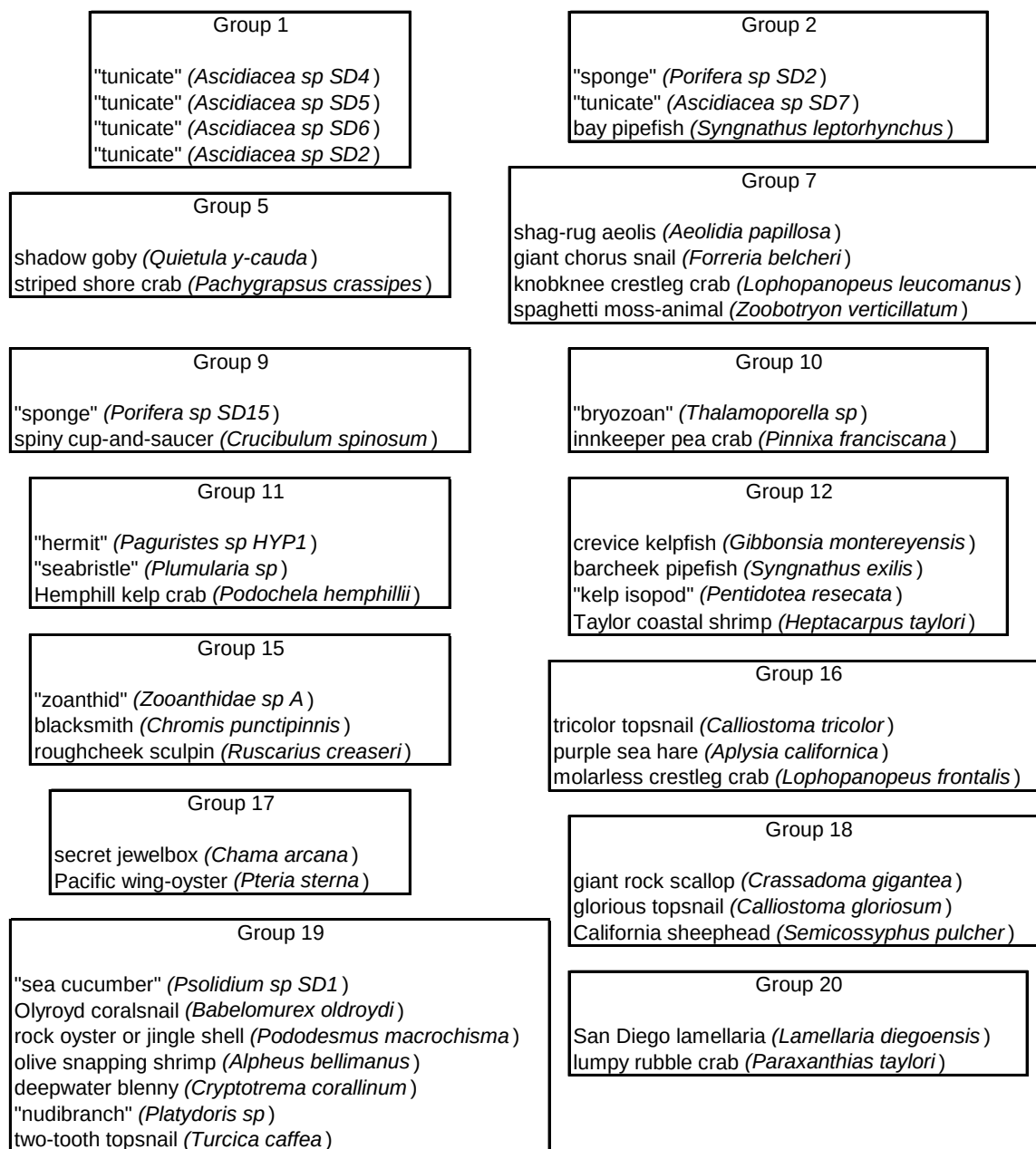
D7. Abundance of megabenthic invertebrate species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003.

Invertebrates			Site Cluster									Total Count		
			2	1	5	9	4	8	3	6	7			
			Upper Slope	Upper Slope/ Outer Shelf	Outer Shelf	Middle Shelf	Channel Islands/ Middle Shelf	Inner/ Middle Shelf	Inner Shelf	B&H Central	B&H South			
			Number of Stations											
Species Cluster	Common Name	Scientific Name	15	13	22	48	22	46	14	9	6	195		
A	yellow-green sea squirt	<i>Ciona intestinalis</i>										370	370	
	warty tunicate	<i>Molgula verrucifera</i>									20	420	440	
	mat mussel	<i>Musculista senhousia</i>									108	400	508	
	California aglaja	<i>Navanax inermis</i>									26	32	58	
	cobblestone sea squirt	<i>Styela plicata</i>									198	400	598	
B	Pacific calico scallop	<i>Argopecten ventricosus</i>										66	66	
	kelp scallop	<i>Leptopecten latiauratus</i>										74	14	88
	mussel	<i>Mytilus</i> sp						6				46	52	
	tuberculate sea squirt	<i>Styela clava</i>					2					20	22	
C	trillip sea pen	<i>Acanthoptilum</i> sp	1		299	2,149	498	350	6	370			3,673	
	California sand star	<i>Astropecten verrilli</i>			49	826	12	748	129				1,764	
	gray sand star	<i>Luidia foliolata</i>	2	18	108	91	76	30			2		327	
	white sea urchin	<i>Lytechinus pictus</i>			2,873	16,071	10,371	3,289	420		4		33,028	
	red octopus	<i>Octopus rubescens</i>			8	92	127	87	77	31			422	
	brittle star	<i>Ophiura luetkenii</i>				25	288	87	85				485	
	California sea cucumber	<i>Parastichopus californicus</i>			9	29	473	22	30	3	4		570	
	California sea slug	<i>Pleurobranchaea californica</i>	14	25	16	21	35	10					121	
D	brown spiny doris	<i>Acanthodoris brunnea</i>			1	31		9			6		47	
	California armina	<i>Armina californica</i>			1	18		2					21	
	Alaska bay shrimp	<i>Crangon alaskensis</i>			9	99		5	4				117	
	California blade barnacle	<i>Hamatoscalpellum californicum</i>				195	16	78	19		1		309	
	urn sponge	<i>Leucilla nuttingi</i>				23		4					27	
	tower snail	<i>Megasurcula carpenteriana</i>			2	12							14	
	slender sea pen	<i>Stylatula elongata</i>			1	27		2	11				41	
	yellow sea twig	<i>Thessea</i> sp b			12	318	5	1,242					1,577	
	sea pen	<i>Virgularia agassizi</i>				6		4					10	
	E	roughdisk brittlestar	<i>Amphichondrius granulatus</i>			2	3	18						23
tunicates		Ascidacea				1	19	2					22	
spindle topsnail		<i>Calliostoma turbinum</i>				8	5						13	
icy tunicate		<i>Corella willmeriana</i>					13						13	
California frogsnail		<i>Crossata californica</i>				12		4					16	
feather star		<i>Florometra serratissima</i>			5	206	13						224	
blood star		<i>Henricia leviuscula</i>					14						14	
Kellett whelk		<i>Kelletia kelletii</i>				1	1	7					9	
California market squid		<i>Loligo opalescens</i>		2	2	348	1	27	4				384	
pink sea whip		<i>Lophogorgia chilensis</i>					6	4					10	
mosaic sand star		<i>Luidia armata</i>				21	3	8	3				35	
fringed sand star		<i>Luidia asthenosoma</i>			1	1	14	10	1				27	
red sea star		<i>Mediaster aequalis</i>	174	76	3	11	147	1					412	
gigantic anemone		<i>Metridium farcimen</i>		2	35	10	3						50	
roughspine brittlestar		<i>Ophiopholis bakeri</i>	12	1	20	36	63						132	
Pacific spiny brittlestar		<i>Ophiothrix spiculata</i>		3	1	77	569	796			2		1,448	
slenderclaw hermit		<i>Paguristes turgidus</i>			8		2	1					11	
brown cup coral		<i>Paracyathus stearnsii</i>					18	4					22	
white paperbubble		<i>Philine alba</i>	3			56	128	1					188	
sunflower star		<i>Pycnopodia helianthoides</i>					24						24	
banded sea star		<i>Sclerasterias heteropaes</i>					16						16	
sea-squirt		<i>Styela</i> sp					4				6		10	
fish-eating star		<i>Stylasterias forreri</i>	1	1	1		9						12	
rosy tritonia		<i>Tritonia diomedea</i>			7	14	21	7					49	
California sea pen	<i>Virgularia californica</i>		1		28	7	9					45		
F	orange sand star	<i>Astropecten ornatissimus</i>		1	116	4	5						126	
	Crawford nutmeg	<i>Cancellaria crawfordiana</i>	3	1	4	2							10	
	Adam spiny margarite	<i>Cidarina cidaris</i>			10		1						11	
	basket star	<i>Gorgonocephalus eucnemis</i>			28								28	
	brown box crab	<i>Lopholithodes foraminatus</i>		1	25		1						27	
	southern spinyhead	<i>Metacrangon spinosissima</i>		11	8	4	1						24	
	smooth western nassa	<i>Nassarius insculptus</i>			15	1							16	
	gray shrimp	<i>Neocrangon communis</i>			433								433	
	pycnogonid	<i>Nymphon pixellae</i>				20	18						38	
	ocean shrimp	<i>Pandalus jordani</i>		803	7								810	
G	armed box crab	<i>Platymera gaudichaudii</i>				23	9	8	8				48	
	spiny sand star	<i>Astropecten armatus</i>							24	2	6		32	

D7. (continued)

			Site Cluster									Total Count
			2	1	5	9	4	8	3	6	7	
			Upper Slope	Upper Slope/ Outer Shelf	Outer Shelf	Middle Shelf	Channel Islands/ Middle Shelf	Inner/ Middle Shelf	Inner Shelf	B&H Central	B&H South	
			15	13	22	48	22	46	14	9	6	
Invertebrates			Number of Stations									
Species Cluster	Common Name	Scientific Name										
G	blackspotted bay shrimp	<i>Crangon nigromaculata</i>						1,769	96	54		1,919
	Stimpson coastal shrimp	<i>Heptacarpus stimpsoni</i>						32				32
	New Zealand papperbubble	<i>Philine auriformis</i>			134	68	10	495	4	166	4	881
	shortspined sea star	<i>Pisaster brevispinus</i>						4	9			13
	tuberculate pear crab	<i>Pyromaia tuberculata</i>				2		30	3	148		183
	maculated triopha	<i>Triopha maculata</i>					6	29		2		37
H	Pacific acorn barnacle	<i>Paraconcanvus pacificus</i>						29				29
	Spanish shawl	<i>Flabellina iodinea</i>						25				25
	sandflat elbow crab	<i>Heterocrypta occidentalis</i>				1	1	15		2		19
	moss crab	<i>Loxorhynchus crispatus</i>			1		1	10		2		14
	spotwrist hermit	<i>Pagurus spilocarpus</i>				3		5		6		14
	northern kelp crab	<i>Pugettia producta</i>						38		6	2	46
I	sea mouse	<i>Aphrodita sp</i>	40	2		1	2	1				46
	ophiuroid	<i>Asteronyx longifissus</i>	9,169	3								9,172
	sea pen	<i>Halopteris californica</i>	44		1	1		1				47
	sea star	<i>Myxoderma platyacanthum</i>	9,460	1,111								10,571
	holothuroid	<i>Pannychia moseleyi</i>	539	2								541
	sponge	<i>Porifera</i>	1,568	3	1	4	6	31	1	16		1,630
	sea star	<i>Pseudarchaster pusillus</i>	153	1								154
	signet ring anemone	<i>Stephanauge annularis</i>	57	1		1						59
J	northern heart urchin	<i>Brisaster latifrons</i>	28,750	6,511	809		4					36,074
	orange bigeye octopus	<i>Octopus californicus</i>	32	59	9	3						103
	California heart urchin	<i>Spatangus californicus</i>	2,166	1,382	64		4	1				3,617
	offshore blade shrimp	<i>Spirontocaris sica</i>	178	308	23							509
K	fragile sea urchin	<i>Allocentrotus fragilis</i>	2,634	9,553	7,275	7	1,371	77				20,917
	Pacific heart urchin	<i>Brissopsis pacifica</i>	6,859	1,578	117		14					8,568
	sea dandelion	<i>Dromalia alexandri</i>	24	388	7							419
	flagnose bay shrimp	<i>Neocrangon resima</i>		26	38		2					66
	moustache bay shrimp	<i>Neocrangon zaeae</i>		75	512	2	6	1				596
	spot shrimp	<i>Pandalus platyceros</i>	10	84	2	122	11	44				273
	eastern Pacific bobtail	<i>Rossia pacifica</i>	3	86	51	38	4	6				188
	ridgeback rock shrimp	<i>Sicyonia ingentis</i>		92	3,726	191	145	21				4,175
	slender blade shrimp	<i>Spirontocaris holmesi</i>	23	577	408							1,008

B&H = Bays and Harbors



D8. Recurrent groups of combined demersal fishes and megabenthic invertebrates occurring at single sites on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003. Index of affinity (I.A.) = 0.5 (0.495). Groups are numbered from shallow to deep. Species within a group are listed in order of abundance. Lines show relationships between groups and associated, with values indicating the proportion of possible pairs with I.A. = 0.50.

Group 21
globose kelp crab (*Taliepus nuttallii*)
granulose topsnail (*Calliostoma supragranosum*)

Group 27
spiny scallop (*Chlamys hastata*)
flatspine brittlestar (*Ophiopertis papillosa*)
"gastropod" (*Trivia ritteri*)
appleseed erato (*Erato vitellina*)

Group 30
"bryozoan" (*Schizoporella inarmata*)
"hydroid" (*Abietinaria* sp)
fleshy sea pen (*Ptilosarcus gurneyi*)

Group 32
"sea cucumber" (*Psolidium* sp)
"sea star" (*Henricia aspera*)
"tunicate" (*Molgula regularis*)
"sea squirt" (*Bathypera feminalba*)

Group 38
California sun star (*Rathbunaster californicus*)
swell shark (*Cephaloscyllium ventriosum*)

Group 40
fringed sculpin (*Icelinus fimbriatus*)
"sea cucumber" (*Cucumaria* sp C1)

Group 45
luminescent zoanthid (*Epizoanthus induratus*)
Cooper's nutmeg (*Cancellaria cooperi*)

Group 22
"bryozoan" (*Cellaria mandibulata*)
"bryozoan" (*Hippopodina californica*)
fluted bryozoan (*Hippodiplosia insculpta*)
Hudson spiny doris (*Acanthodoris hudsoni*)

Group 28
foliate kelp crab (*Mimulus foliatus*)
holdfast brittlestar (*Amphipholis squamata*)
festive murex (*Pteropurpura festiva*)

Group 31
gray puffball sponge (*Tetilla arb*)
"sea fan" (*Euplexaura* sp)
"zoanthid" (*Zooanthidae* sp B)

Group 33
big skate (*Raja binoculata*)
Catalina forreria (*Austrotrophon catalinensis*)

Group 36
"lamp shell" (*Terebratulina unguicula*)
Stearns turrid (*Megasurcula stearnsiana*)

Group 39
red lamp shell (*Terebratalia transversa*)
barrel snail (*Rictaxis paine*)
"trophon" (*Scabrotrophon grovesi*)

Group 46
"isopod" (*Aega lecontii*)
Ida's miter (*Mitra ida*)

D8. (continued)

Group 48

white lamp shell (*Terebratulina crossei*)
frogmouth sculpin (*Icelinus oculatus*)
California squat lobster (*Galathea californiensis*)
"sea star" (*Odontaster crassus*)
silvery topsnail (*Calliostoma platinum*)

Group 58

slender hatchetfish (*Argyropelecus affinis*)
blackbelly dragonfish (*Stomias atriventer*)
bulldog lightfish (*Ichthyococcus irregularis*)

Group 60

humpback snailfish (*Elassodiscus caudatus*)
northern squat lobster (*Munida quadrispina*)

Group 49

pelagic red crab (*Pleuroncodes planipes*)
stripefin poacher (*Xeneretmus ritteri*)

Group 55

spiny red star (*Hippasteria spinosa*)
feather boa sea pen (*Anthoptilum grandiflorum*)

Group 59

"sea star" (*Thrissacanthias penicillatus*)
"squat lobster" (*Munidopsis depressa*)

D8. (continued)

D9. Frequency of occurrence (number of stations) of demersal fish and megabenthic invertebrate species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003.

Species	Cluster	Common Name	Scientific Name	Site Cluster									Total Count					
				2	1	7	6	8	9	4	5	3						
				Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle/ Inner Shelf	Inner Shelf/B&H N/C	Inner Shelf	B&H C/S						
				Number of Stations										18	25	16	21	16
A		trillip sea pen	<i>Acanthoptilum sp</i>	1	3	10	17	8	21	5	1	3	69					
		California sand star	<i>Astropecten verrilli</i>	-	1	7	7	15	41	1	18	-	90					
		roughback sculpin	<i>Chitonotus pugetensis</i>	-	-	-	8	6	35	-	4	-	53					
		Pacific sanddab	<i>Citharichthys sordidus</i>	2	16	15	21	16	45	5	11	-	131					
		speckled sanddab	<i>Citharichthys stigmatosus</i>	-	1	-	8	1	28	12	28	1	79					
		longfin sanddab	<i>Citharichthys xanthostigma</i>	-	2	1	-	11	38	2	10	-	64					
		Alaska bay shrimp	<i>Crangon alaskensis</i>	-	-	-	2	7	12	2	-	-	23					
		bigmouth sole	<i>Hippoglossina stomata</i>	-	5	3	8	8	36	2	6	-	68					
		yellowchin sculpin	<i>Icelinus quadriseriatus</i>	-	-	1	14	15	43	7	7	-	87					
		bay goby	<i>Lepidogobius lepidus</i>	-	-	1	1	14	24	7	-	-	47					
		gray sand star	<i>Luidia foliolata</i>	2	9	7	15	7	19	2	1	-	62					
		white sea urchin	<i>Lytechinus pictus</i>	-	2	7	17	10	31	-	3	1	71					
		red sea star	<i>Mediaster aequalis</i>	6	4	3	19	1	3	-	-	-	36					
		Dover sole	<i>Microstomus pacificus</i>	17	24	14	16	16	18	4	1	-	110					
		red octopus	<i>Octopus rubescens</i>	-	13	7	19	12	23	5	9	-	88					
		pygmy poacher	<i>Odontopyxis trispinosa</i>	-	1	2	11	5	16	2	4	-	41					
		lingcod	<i>Ophiodon elongatus</i>	-	2	-	11	3	14	4	5	-	39					
		Pacific spiny brittlestar	<i>Ophiotrix spiculata</i>	-	2	-	9	2	21	1	1	-	36					
		brittle star	<i>Ophiura luetkenii</i>	-	3	9	13	13	25	2	-	-	65					
		California sea cucumber	<i>Parastichopus californicus</i>	-	2	4	7	14	24	2	2	1	56					
		English sole	<i>Parophrys vetulus</i>	3	7	6	14	9	28	9	21	-	97					
		California sea slug	<i>Pleurobranchaea californica</i>	7	13	5	9	5	8	1	1	-	49					
		curffin sole	<i>Pleuronichthys decurrens</i>	-	-	4	13	-	5	-	15	-	37					
		hornyhead turbot	<i>Pleuronichthys verticalis</i>	-	2	1	10	10	44	14	17	-	98					
		plainfin midshipman	<i>Porichthys notatus</i>	-	8	8	17	15	21	9	1	-	79					
		California scorpionfish	<i>Scorpaena guttata</i>	-	1	-	5	2	32	2	5	-	47					
		stripetail rockfish	<i>Sebastes saxicola</i>	-	21	11	17	13	21	4	2	-	89					
		halfbanded rockfish	<i>Sebastes semicinctus</i>	-	4	6	16	12	17	2	-	-	57					
		California tonguefish	<i>Symphurus atricaudus</i>	-	-	-	-	11	41	9	3	1	65					
		pink seaperch	<i>Zalemibus rosaceus</i>	-	3	6	17	14	35	6	9	-	90					
		longspine combfish	<i>Zaniolepis latipinnis</i>	-	3	5	17	16	36	8	4	-	89					
B		sablefish	<i>Anoplopoma fimbria</i>	10	3	-	-	-	-	-	-	-	13					
		sea mouse	<i>Aphrodita sp</i>	9	1	-	2	1	1	-	-	-	14					
		ophiroid	<i>Asteronox longifissus</i>	8	1	-	-	-	-	-	-	-	9					
		northern heart urchin	<i>Brisaster latifrons</i>	14	13	-	2	-	-	-	-	-	29					
		Pacific hagfish	<i>Eptatretus stoutii</i>	3	2	-	-	-	-	-	-	-	5					
		dogface witch eel	<i>Facciolella equatorialis</i>	5	-	-	-	-	-	-	-	-	5					
		sea pen	<i>Halopteris californica</i>	5	-	2	-	-	-	1	-	-	8					
		bigfin eelpout	<i>Lycodes cortezianus</i>	13	5	-	-	-	-	-	-	-	18					
		sea star	<i>Myxoderma platyacanthum</i>	10	1	-	-	-	-	-	-	-	11					
		holothuroid	<i>Pannychia moseleyi</i>	11	1	-	-	-	-	-	-	-	12					
		filetail cat shark	<i>Parmaturus xaniurus</i>	6	2	-	-	-	-	-	-	-	8					
		sponge	<i>Porifera</i>	7	1	3	6	1	2	-	1	5	26					
		sea star	<i>Pseudarchaster pusillus</i>	6	1	-	-	-	-	-	-	-	7					
		shortspine thornyhead	<i>Sebastolobus alascanus</i>	9	3	-	-	-	-	-	-	-	12					
		California heart urchin	<i>Spatangus californicus</i>	8	14	3	1	-	-	-	-	-	26					
		offshore blade shrimp	<i>Spirontocaris sica</i>	13	7	-	-	-	-	-	-	-	20					
		northern lampfish	<i>Stenobrachius leucopsarus</i>	10	2	-	-	-	-	-	-	-	12					
		signet ring anemone	<i>Stephanauge annularis</i>	4	1	1	-	-	-	-	-	-	6					
C		slough anchovy	<i>Anchoa delicatissima</i>	-	-	-	-	-	-	-	-	6	6					
		Pacific calico scallop	<i>Argopecten ventricosus</i>	-	-	-	-	-	-	-	-	7	7					
		yellow-green sea squirt	<i>Ciona intestinalis</i>	-	-	-	-	-	-	-	1	4	5					
		kelp scallop	<i>Leptopecten latiauratus</i>	-	-	-	-	-	-	-	1	7	8					
		warty tunicate	<i>Molgula verrucifera</i>	-	-	-	-	-	-	-	-	4	4					
		mat mussel	<i>Musculista senhousia</i>	-	-	-	-	-	-	-	-	7	7					
		mussel	<i>Mytilus sp</i>	-	-	-	-	-	-	1	-	5	6					
		California aglaja	<i>Navanax inermis</i>	-	-	-	-	-	-	2	1	8	11					
		spotted sand bass	<i>Paralabrax maculatofasciatus</i>	-	-	-	-	-	-	-	-	7	7					
		barred sand bass	<i>Paralabrax nebulifer</i>	-	-	-	-	-	1	1	1	11	14					
		diamond turbot	<i>Pleuronichthys guttulatus</i>	-	-	-	-	-	-	-	2	9	11					
		tuberculate sea squirt	<i>Styela clava</i>	-	-	1	1	-	-	-	-	3	5					
		cobblestone sea squirt	<i>Styela plicata</i>	-	-	-	-	-	-	-	-	7	7					
		round stingray	<i>Urobatis halleri</i>	-	-	-	-	-	-	1	-	9	10					

D9. (continued)

Species Cluster			Site Cluster									Total Count
			2	1	7	6	8	9	4	5	3	
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle/ Inner Shelf	Inner Shelf/B&H N/C	Inner Shelf	B&H C/S	
			Number of Stations									
18	25	16	21	16	48	20	30	16	210			
D	orange sand star	<i>Astropecten ornatissimus</i>	-	4	3	4	-	-	-	-	-	11
	spotted cusk-eel	<i>Chilara taylori</i>	1	6	8	7	2	6	-	1	-	31
	Adam spiny margarite	<i>Cidarina cidaris</i>	-	1	3	1	-	-	-	-	-	5
	feather star	<i>Florometra serratissima</i>	-	1	7	1	1	-	-	-	-	10
	basket star	<i>Gorgonocephalus eucnemis</i>	-	2	4	-	-	-	-	-	-	6
	spotted ratfish	<i>Hydrolagus colliei</i>	1	4	4	-	-	-	-	-	-	9
	spotfin sculpin	<i>Icelinus tenuis</i>	-	-	10	6	1	1	-	-	-	18
	brown box crab	<i>Lopholithodes foraminatus</i>	-	4	3	1	-	-	-	-	-	8
	fringed sand star	<i>Luidia asthenosoma</i>	1	1	6	4	5	1	-	2	-	20
	gigantic anemone	<i>Metridium farcimen</i>	1	4	2	3	3	-	-	-	-	13
	pycnogonid	<i>Nymphon pixellae</i>	-	1	7	-	1	-	-	-	-	9
	roughspine brittlestar	<i>Ophiopholis bakeri</i>	4	4	4	7	1	-	-	-	-	20
	slenderclaw hermit	<i>Paguristes turgidus</i>	-	2	1	2	-	2	-	-	-	7
	white paperbubble	<i>Philine alba</i>	1	-	4	9	1	1	-	-	-	16
	armed box crab	<i>Platymera gaudichaudii</i>	-	4	4	3	1	3	5	1	-	21
	greenstriped rockfish	<i>Sebastes elongatus</i>	-	7	8	6	7	1	-	-	-	29
	greenblotched rockfish	<i>Sebastes rosenblatti</i>	-	6	2	1	4	1	1	-	-	15
	bluespotted poacher	<i>Xeneretmus triacanthus</i>	-	1	8	5	2	-	-	-	-	16
	shortspine combfish	<i>Zaniolepis frenata</i>	1	20	13	16	6	4	-	-	-	60
	E	fragile sea urchin	<i>Allocentrotus fragilis</i>	10	23	8	6	2	1	-	-	-
Pacific heart urchin		<i>Brissopsis pacifica</i>	8	11	1	4	1	-	-	-	-	25
Crawford nutmeg		<i>Cancellaria crawfordiana</i>	1	1	3	-	1	-	-	-	-	6
sea dandelion		<i>Dromalia alexandri</i>	7	9	1	-	-	-	-	-	-	17
rex sole		<i>Glyptocephalus zachirus</i>	7	19	4	-	1	-	-	-	-	31
blackbelly eelpout		<i>Lycodes pacificus</i>	-	20	3	3	5	-	-	-	-	31
bearded eelpout		<i>Lycanema barbatum</i>	2	11	1	3	-	-	-	-	-	17
slender sole		<i>Lyopsetta exilis</i>	15	25	9	1	5	1	-	-	-	56
Pacific hake		<i>Merluccius productus</i>	10	19	3	-	-	-	-	-	-	32
southern spinyhead		<i>Metacrangon spinosissima</i>	-	7	2	-	4	-	-	-	-	13
smooth western nassa		<i>Nassarius insculptus</i>	-	3	3	-	-	1	-	-	-	7
gray shrimp		<i>Neocrangon communis</i>	1	5	-	-	-	-	-	-	-	6
flagnose bay shrimp		<i>Neocrangon resima</i>	-	12	3	1	-	1	-	-	-	17
moustache bay shrimp		<i>Neocrangon zaeae</i>	1	19	3	1	2	3	-	-	-	29
orange bigeye octopus		<i>Octopus californicus</i>	12	13	-	-	-	-	1	-	-	26
ocean shrimp		<i>Pandalus jordani</i>	-	4	1	-	-	-	-	-	-	5
spot shrimp		<i>Pandalus platyceros</i>	2	7	1	4	2	7	1	-	-	24
bluebarred prickleback		<i>Plectobranchus evides</i>	-	11	1	2	1	-	-	-	-	15
eastern Pacific bobtail		<i>Rossia pacifica</i>	4	16	4	3	12	12	1	-	-	52
splitnose rockfish		<i>Sebastes diploproa</i>	10	17	-	-	1	-	-	-	-	28
F	ridgeback rock shrimp	<i>Sicyonia ingentis</i>	-	16	3	7	11	9	4	-	-	50
	slender blade shrimp	<i>Spirontocaris holmesi</i>	4	12	-	-	-	-	-	-	-	16
	blacktip poacher	<i>Xeneretmus latifrons</i>	2	21	6	1	3	-	-	-	-	33
	spiny sand star	<i>Astropecten armatus</i>	-	-	-	-	-	-	1	5	1	7
	graceful rock crab	<i>Cancer gracilis</i>	-	-	-	-	-	1	2	7	1	11
	blackspotted bay shrimp	<i>Crangon nigromaculata</i>	-	-	-	-	-	5	12	11	-	28
	shiner perch	<i>Cymatogaster aggregata</i>	-	-	-	1	-	1	8	7	3	20
	northern anchovy	<i>Engraulis mordax</i>	-	-	-	-	-	-	9	-	1	10
	Spanish shawl	<i>Flabellina iodinea</i>	-	-	-	-	-	4	1	4	-	9
	white croaker	<i>Genyonemus lineatus</i>	-	-	-	-	-	6	14	-	1	21
	Stimpson coastal shrimp	<i>Heptacarpus stimpsoni</i>	-	-	-	-	-	4	1	-	-	5
	sandflat elbow crab	<i>Heterocyprina occidentalis</i>	-	-	-	1	-	1	1	7	-	10
	spotwrist hermit	<i>Pagurus spilocarpus</i>	-	-	-	-	-	5	2	1	-	8
	California halibut	<i>Paralichthys californicus</i>	-	-	-	-	-	10	8	13	14	45
	Pacific pompano	<i>Pepilius simillimus</i>	-	-	-	-	2	-	6	-	-	8
	white seaperch	<i>Phanerodon furcatus</i>	-	-	-	-	-	-	8	9	-	17
	New Zealand papperbubble	<i>Philine auriformis</i>	-	6	2	2	10	25	4	2	1	52
	shortspined sea star	<i>Pisaster brevispinus</i>	-	-	-	-	-	3	4	4	-	11
	spotted turbot	<i>Pleuronichthys ritteri</i>	-	-	-	-	-	2	4	3	2	11
	specklefin midshipman	<i>Porichthys myriaster</i>	-	-	-	-	-	5	10	4	5	24
northern kelp crab	<i>Pugettia producta</i>	-	-	-	-	-	1	1	5	2	9	
tuberculate pear crab	<i>Pyromaia tuberculata</i>	-	-	-	-	-	3	6	5	6	20	
California skate	<i>Raja inornata</i>	-	1	2	5	3	16	5	1	-	33	
copper rockfish	<i>Sebastes caurinus</i>	-	-	-	1	-	3	1	5	-	10	

D9. (continued)

			Site Cluster									Total Count
			2	1	7	6	8	9	4	5	3	
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle/ Inner Shelf	Inner Shelf/B& H N/C	Inner Shelf	B&H C/S	
Number of Stations			18	25	16	21	16	48	20	30	16	210
Species Cluster	Common Name	Scientific Name										
F	calico rockfish	<i>Sebastes dallii</i>	-	-	1	-	1	5	-	-	-	7
	vermillion rockfish	<i>Sebastes miniatus</i>	-	-	-	1	-	3	3	3	-	10
	queenfish	<i>Seriphus politus</i>	-	-	-	-	-	-	13	1	1	15
	California lizardfish	<i>Synodus lucioiceps</i>	-	-	-	-	7	22	5	9	-	43
	maculated triopha	<i>Triopha maculata</i>	-	-	-	3	-	2	2	1	-	8
G	brown spiny doris	<i>Acanthodoris brunnea</i>	-	1	1	-	2	13	1	2	-	20
	southern spearnose poacher	<i>Agonopsis sterletus</i>	-	-	-	4	-	3	-	1	-	8
	roughdisk brittlestar	<i>Amphichondrius granulatus</i>	-	-	2	5	1	-	-	-	-	8
	Pacific argentine	<i>Argentina sialis</i>	-	3	2	-	10	4	-	-	-	19
	California armina	<i>Armina californica</i>	-	-	-	-	4	7	1	-	-	12
	tunicates	Ascidacea	-	-	-	2	1	-	-	2	-	5
	spindle topsnail	<i>Calliostoma turbinum</i>	-	-	-	2	4	2	-	-	-	8
	icy tunicate	<i>Corella willmeriana</i>	-	-	-	7	-	-	-	-	-	7
	California frogsnail	<i>Crossata californica</i>	-	-	-	-	-	5	-	-	-	5
	bull sculpin	<i>Enophrys taurina</i>	-	-	-	7	-	1	-	-	-	8
	California blade barnacle	<i>Hamatoscalpellum californicu</i>	-	-	-	5	2	21	1	1	-	30
	blood star	<i>Henricia leviuscula</i>	-	-	-	5	-	-	-	-	-	5
	Kellet whelk	<i>Kelletia kelletii</i>	-	-	1	1	-	4	-	-	-	6
	urn sponge	<i>Leucilla nuttingi</i>	-	-	-	-	-	4	-	1	-	5
	California market squid	<i>Loligo opalescens</i>	-	3	-	1	8	9	5	-	-	26
	pink sea whip	<i>Lophogorgia chilensis</i>	-	-	-	1	-	4	-	-	-	5
	moss crab	<i>Loxorhynchus crispatus</i>	-	-	1	1	-	3	-	2	1	8
	mosaic sand star	<i>Luidia armata</i>	-	-	1	1	1	8	-	1	-	12
	tower snail	<i>Megasurcula carpenteriana</i>	-	1	-	-	5	4	-	-	-	10
	brown cup coral	<i>Paracyathus stearnsii</i>	-	-	2	3	-	1	-	-	-	6
	sunflower star	<i>Pycnopodia helianthoides</i>	-	-	-	10	-	-	-	-	-	10
	blackeye goby	<i>Rhinogobiops nicholsii</i>	-	-	1	3	-	3	-	-	-	7
	banded sea star	<i>Sclerasterias heteropaes</i>	-	-	-	6	-	-	-	-	-	6
	pink rockfish	<i>Sebastes eos</i>	-	7	1	2	9	3	-	-	-	22
	chilipepper	<i>Sebastes goodei</i>	-	2	5	9	1	2	1	1	-	21
	shortbelly rockfish	<i>Sebastes jordani</i>	1	7	2	8	1	4	-	-	-	23
	cowcod	<i>Sebastes levis</i>	-	1	3	10	5	3	1	-	-	23
	sea-squirt	<i>Styela sp</i>	-	-	-	4	-	-	1	-	-	5
	fish-eating star	<i>Stylasterias forreri</i>	1	3	-	5	-	-	-	-	-	9
	slender sea pen	<i>Stylatula elongata</i>	-	-	1	2	3	12	4	-	-	22
	yellow sea twig	<i>Thesea sp b</i>	-	1	4	7	8	20	-	1	-	41
	rosy tritonia	<i>Tritonia diomedea</i>	-	1	1	11	3	4	1	-	-	21
	sea pen	<i>Virgularia agassizi</i>	-	-	-	-	1	2	3	-	-	6
	California sea pen	<i>Virgularia californica</i>	-	1	-	3	-	3	-	3	-	10
	fantail sole	<i>Xystreureys liolepis</i>	-	-	-	-	-	8	1	11	-	20

C = Central; N = Northern; S = Southern; B&H = Bays/Harbors; POTW = Publicly owned treatment work monitoring area.

D10. Frequency of occurrence (percent of stations) of demersal fish and megabenthic invertebrate species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003. Shading denotes greater than 50% occurrence.

			Site Cluster								
			2	1	7	6	8	9	4	5	3
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle / Inner Shelf	Inner Shelf/ B&H N/C	Inner Shelf	B&H C/S
Number of Stations			18	25	16	21	16	48	20	30	16
Depth Range (m)			225-476	132-322	80-192	45-130	57-101	15-86	4-71	7-34	2-12
Species Cluster	Common Name	Scientific Name									
A	trillip sea pen	<i>Acanthoptilum</i> sp	6	12	63	81	50	44	25	3	19
	California sand star	<i>Astropecten verrilli</i>	--	4	44	33	94	85	5	60	--
	roughback sculpin	<i>Chitonotus pugetensis</i>	--	--	--	38	38	73	--	13	--
	Pacific sanddab	<i>Citharichthys sordidus</i>	11	64	94	100	100	94	25	37	--
	speckled sanddab	<i>Citharichthys stigmaeus</i>	--	4	--	38	6	58	60	93	6
	longfin sanddab	<i>Citharichthys xanhostigma</i>	--	8	6	--	69	79	10	33	--
	Alaska bay shrimp	<i>Crangon alaskensis</i>	--	--	--	10	44	25	10	--	--
	bigmouth sole	<i>Hippoglossina stomata</i>	--	20	19	38	50	75	10	20	--
	yellowchin sculpin	<i>Icelinus quadriseriatus</i>	--	--	6	67	94	90	35	23	--
	bay goby	<i>Lepidogobius lepidus</i>	--	--	6	5	88	50	35	--	--
	gray sand star	<i>Luidia foliolata</i>	11	36	44	71	44	40	10	3	--
	white sea urchin	<i>Lytechinus pictus</i>	--	8	44	81	63	65	--	10	6
	red sea star	<i>Mediaster aequalis</i>	33	16	19	90	6	6	--	--	--
	Dover sole	<i>Microstomus pacificus</i>	94	96	88	76	100	38	20	3	--
	red octopus	<i>Octopus rubescens</i>	--	52	44	90	75	48	25	30	--
	pygmy poacher	<i>Odontopyxis trispinosa</i>	--	4	13	52	31	33	10	13	--
	lingcod	<i>Ophiodon elongatus</i>	--	8	--	52	19	29	20	17	--
	Pacific spiny brittlestar	<i>Ophiothrix spiculata</i>	--	8	--	43	13	44	5	3	--
	brittle star	<i>Ophiura luetkenii</i>	--	12	56	62	81	52	10	--	--
	California sea cucumber	<i>Parastichopus californicus</i>	--	8	25	33	88	50	10	7	6
	English sole	<i>Parophrys vetulus</i>	17	28	38	67	56	58	45	70	--
	California sea slug	<i>Pleurobranchaea californica</i>	39	52	31	43	31	17	5	3	--
	curffin sole	<i>Pleuronichthys decurrens</i>	--	--	25	62	--	10	--	50	--
	hornyhead turbot	<i>Pleuronichthys verticalis</i>	--	8	6	48	63	92	70	57	--
	plainfin midshipman	<i>Porichthys notatus</i>	--	32	50	81	94	44	45	3	--
	California scorpionfish	<i>Scorpaena guttata</i>	--	4	--	24	13	67	10	17	--
	stripetail rockfish	<i>Sebastes saxicola</i>	--	84	69	81	81	44	20	7	--
	halfbanded rockfish	<i>Sebastes semicinctus</i>	--	16	38	76	75	35	10	--	--
	California tonguefish	<i>Symphurus atricaudus</i>	--	--	--	--	69	85	45	10	6
	pink seaperch	<i>Zalemblus rosaceus</i>	--	12	38	81	88	73	30	30	--
	longspine combfish	<i>Zaniolepis latipinnis</i>	--	12	31	81	100	75	40	13	--
B	sablefish	<i>Anoplopoma fimbria</i>	56	12	--	--	--	--	--	--	--
	sea mouse	<i>Aphrodita</i> sp	50	4	--	10	6	2	--	--	--
	ophiuroid	<i>Asteronyx longifissus</i>	44	4	--	--	--	--	--	--	--
	northern heart urchin	<i>Brisaster latifrons</i>	78	52	--	10	--	--	--	--	--
	Pacific hagfish	<i>Eptatretus stoutii</i>	17	8	--	--	--	--	--	--	--
	dogface witch eel	<i>Facciolella equatorialis</i>	28	--	--	--	--	--	--	--	--
	sea pen	<i>Halipiter californica</i>	28	--	13	--	--	--	5	--	--

D10. (continued)

			Site Cluster								
			2	1	7	6	8	9	4	5	3
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle / Inner Shelf	Inner Shelf/ B&H N/C	Inner Shelf	B&H C/S
Depth Range (m)			18	25	16	21	16	48	20	30	16
Species Cluster	Common Name	Scientific Name	225-476	132-322	80-192	45-130	57-101	15-86	4-71	7-34	2-12
B	bigfin eelpout	<i>Lycodes cortezianus</i>	72	20	--	--	--	--	--	--	--
	sea star	<i>Myxoderma platyacanthum</i>	56	4	--	--	--	--	--	--	--
	holothuroid	<i>Pannychia moseleyi</i>	61	4	--	--	--	--	--	--	--
	filetail cat shark	<i>Parmaturus xanilurus</i>	33	8	--	--	--	--	--	--	--
	sponge	<i>Porifera</i>	39	4	19	29	6	4	--	3	31
	sea star	<i>Pseudarchaster pusillus</i>	33	4	--	--	--	--	--	--	--
	shortspine thornyhead	<i>Sebastolobus alascanus</i>	50	12	--	--	--	--	--	--	--
	California heart urchin	<i>Spatangus californicus</i>	44	56	19	5	--	--	--	--	--
	offshore blade shrimp	<i>Spirontocaris sica</i>	72	28	--	--	--	--	--	--	--
	northern lampfish	<i>Stenobranchius leucopsarus</i>	56	8	--	--	--	--	--	--	--
C	signet ring anemone	<i>Stephanauge annularis</i>	22	4	6	--	--	--	--	--	--
	slough anchovy	<i>Anchoa delicatissima</i>	--	--	--	--	--	--	--	--	38
	Pacific calico scallop	<i>Argopecten ventricosus</i>	--	--	--	--	--	--	--	--	44
	yellow-green sea squirt	<i>Ciona intestinalis</i>	--	--	--	--	--	--	--	3	25
	kelp scallop	<i>Leptopecten latiauratus</i>	--	--	--	--	--	--	--	3	44
	warty tunicate	<i>Molgula verrucifera</i>	--	--	--	--	--	--	--	--	25
	mat mussel	<i>Musculista senhousia</i>	--	--	--	--	--	--	--	--	44
	mussel	<i>Mytilus sp</i>	--	--	--	--	--	--	5	--	31
	California aglaja	<i>Navanax inermis</i>	--	--	--	--	--	--	10	3	50
	spotted sand bass	<i>Paralabrax maculatofasciatus</i>	--	--	--	--	--	--	--	--	44
	barred sand bass	<i>Paralabrax nebulifer</i>	--	--	--	--	--	2	5	3	69
	diamond turbot	<i>Pleuronichthys guttulatus</i>	--	--	--	--	--	--	--	7	56
	tuberculate sea squirt	<i>Styela clava</i>	--	--	6	5	--	--	--	--	19
	cobblestone sea squirt	<i>Styela plicata</i>	--	--	--	--	--	--	--	--	44
	round stingray	<i>Urobatis halleri</i>	--	--	--	--	--	--	5	--	56
D	orange sand star	<i>Astropecten ornatissimus</i>	--	16	19	19	--	--	--	--	--
	spotted cusk-eel	<i>Chilara taylori</i>	6	24	50	33	13	13	--	3	--
	Adam spiny margarite	<i>Cidarina cidaris</i>	--	4	19	5	--	--	--	--	--
	feather star	<i>Florometra serratissima</i>	--	4	44	5	6	--	--	--	--
	basket star	<i>Gorgonocephalus eucnemis</i>	--	8	25	--	--	--	--	--	--
	spotted ratfish	<i>Hydrolagus collii</i>	6	16	25	--	--	--	--	--	--
	spotfin sculpin	<i>Icelinus tenuis</i>	--	--	63	29	6	2	--	--	--
	brown box crab	<i>Lopholithodes foraminatus</i>	--	16	19	5	--	--	--	--	--
	fringed sand star	<i>Luidia asthenosoma</i>	6	4	38	19	31	2	--	7	--
	gigantic anemone	<i>Metridium farcimen</i>	6	16	13	14	19	--	--	--	--
	pycnogonid	<i>Nymphon pixellae</i>	--	4	44	--	6	--	--	--	--
	roughspine brittlestar	<i>Ophiopholis bakeri</i>	22	16	25	33	6	--	--	--	--
	slenderclaw hermit	<i>Paguristes turgidus</i>	--	8	6	10	--	4	--	--	--
	white paperbubble	<i>Philine alba</i>	6	--	25	43	6	2	--	--	--

D10. (continued)

			Site Cluster								
			2	1	7	6	8	9	4	5	3
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle / Inner Shelf	Inner Shelf/ B&H N/C	Inner Shelf	B&H C/S
Depth Range (m)			18	25	16	21	16	48	20	30	16
Species Cluster	Common Name	Scientific Name	225-476	132-322	80-192	45-130	57-101	15-86	4-71	7-34	2-12
D	armed box crab	<i>Platymera gaudichaudii</i>	--	16	25	14	6	6	25	3	--
	greenstriped rockfish	<i>Sebastes elongatus</i>	--	28	50	29	44	2	--	--	--
	greenblotched rockfish	<i>Sebastes rosenblatti</i>	--	24	13	5	25	2	5	--	--
	bluespotted poacher	<i>Xeneretmus triacanthus</i>	--	4	50	24	13	--	--	--	--
	shortspine combfish	<i>Zaniolepis frenata</i>	6	80	81	76	38	8	--	--	--
E	fragile sea urchin	<i>Allocentrotus fragilis</i>	56	92	50	29	13	2	--	--	--
	Pacific heart urchin	<i>Brissopsis pacifica</i>	44	44	6	19	6	--	--	--	--
	Crawford nutmeg	<i>Cancellaria crawfordiana</i>	6	4	19	--	6	--	--	--	--
	sea dandelion	<i>Dromalia alexandri</i>	39	36	6	--	--	--	--	--	--
	rex sole	<i>Glyptocephalus zachirus</i>	39	76	25	--	6	--	--	--	--
	blackbelly eelpout	<i>Lycodes pacificus</i>	--	80	19	14	31	--	--	--	--
	bearded eelpout	<i>Lyconema barbatum</i>	11	44	6	14	--	--	--	--	--
	slender sole	<i>Lyopsetta exilis</i>	83	100	56	5	31	2	--	--	--
	Pacific hake	<i>Merluccius productus</i>	56	76	19	--	--	--	--	--	--
	southern spinyhead	<i>Metacrangon spinosissima</i>	--	28	13	--	25	--	--	--	--
	smooth western nassa	<i>Nassarius insculptus</i>	--	12	19	--	--	2	--	--	--
	gray shrimp	<i>Neocrangon communis</i>	6	20	--	--	--	--	--	--	--
	flagnose bay shrimp	<i>Neocrangon resima</i>	--	48	19	5	--	2	--	--	--
	moustache bay shrimp	<i>Neocrangon zaca</i>	6	76	19	5	13	6	--	--	--
	orange bigeye octopus	<i>Octopus californicus</i>	67	52	--	--	--	--	5	--	--
	ocean shrimp	<i>Pandalus jordani</i>	--	16	6	--	--	--	--	--	--
	spot shrimp	<i>Pandalus platyceros</i>	11	28	6	19	13	15	5	--	--
	bluebarred prickleback	<i>Plectobranthus evides</i>	--	44	6	10	6	--	--	--	--
	eastern Pacific bobtail	<i>Rossia pacifica</i>	22	64	25	14	75	25	5	--	--
	splitnose rockfish	<i>Sebastes diploproa</i>	56	68	--	--	6	--	--	--	--
	ridgeback rock shrimp	<i>Sicyonia ingentis</i>	--	64	19	33	69	19	20	--	--
	slender blade shrimp	<i>Spirontocaris holmesi</i>	22	48	--	--	--	--	--	--	--
	blacktip poacher	<i>Xeneretmus latifrons</i>	11	84	38	5	19	--	--	--	--
F	spiny sand star	<i>Astropecten armatus</i>	--	--	--	--	--	--	5	17	6
	graceful rock crab	<i>Cancer gracilis</i>	--	--	--	--	--	2	10	23	6
	blackspotted bay shrimp	<i>Crangon nigromaculata</i>	--	--	--	--	--	10	60	37	--
	shiner perch	<i>Cymatogaster aggregata</i>	--	--	--	5	--	2	40	23	19
	northern anchovy	<i>Engraulis mordax</i>	--	--	--	--	--	--	45	--	6
	Spanish shawl	<i>Flabellina iodinea</i>	--	--	--	--	--	8	5	13	--
	white croaker	<i>Genyonemus lineatus</i>	--	--	--	--	--	13	70	--	6
	Stimpson coastal shrimp	<i>Heptacarpus stimpsoni</i>	--	--	--	--	--	8	5	--	--
	sandflat elbow crab	<i>Heterocrypta occidentalis</i>	--	--	--	5	--	2	5	23	--
	spotwrist hermit	<i>Pagurus spilocarpus</i>	--	--	--	--	--	10	10	3	--
	California halibut	<i>Paralichthys californicus</i>	--	--	--	--	--	21	40	43	88

D10. (continued)

			Site Cluster								
			2	1	7	6	8	9	4	5	3
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle / Inner Shelf	Inner Shelf/ B&H N/C	Inner Shelf	B&H C/S
Depth Range (m)			18	25	16	21	16	48	20	30	16
Species Cluster	Common Name	Scientific Name	225-476	132-322	80-192	45-130	57-101	15-86	4-71	7-34	2-12
F	Pacific pompano	<i>Peprilus simillimus</i>	--	--	--	--	13	--	30	--	--
	white seaperch	<i>Phanerodon furcatus</i>	--	--	--	--	--	--	40	30	--
	New Zealand papperbubble	<i>Philine auriformis</i>	--	24	13	10	63	52	20	7	6
	shortspined sea star	<i>Pisaster brevispinus</i>	--	--	--	--	--	6	20	13	--
	spotted turbot	<i>Pleuronichthys ritteri</i>	--	--	--	--	--	4	20	10	13
	specklefin midshipman	<i>Porichthys myriaster</i>	--	--	--	--	--	10	50	13	31
	northern kelp crab	<i>Pugettia producta</i>	--	--	--	--	--	2	5	17	13
	tuberculate pear crab	<i>Pyromaia tuberculata</i>	--	--	--	--	--	6	30	17	38
	California skate	<i>Raja inornata</i>	--	4	13	24	19	33	25	3	--
	copper rockfish	<i>Sebastes caurinus</i>	--	--	--	5	--	6	5	17	--
	calico rockfish	<i>Sebastes dallii</i>	--	--	6	--	6	10	--	--	--
	vermillion rockfish	<i>Sebastes miniatus</i>	--	--	--	5	--	6	15	10	--
	queenfish	<i>Seriphus politus</i>	--	--	--	--	--	--	65	3	6
	California lizardfish	<i>Synodus lucioceps</i>	--	--	--	--	44	46	25	30	--
G	maculated triopha	<i>Triopha maculata</i>	--	--	--	14	--	4	10	3	--
	brown spiny doris	<i>Acanthodoris brunnea</i>	--	4	6	--	13	27	5	7	--
	southern spearnose poacher	<i>Agonopsis sterletus</i>	--	--	--	19	--	6	--	3	--
	roughdisk brittlestar	<i>Amphichondrius granulatus</i>	--	--	13	24	6	--	--	--	--
	Pacific argentine	<i>Argentina sialis</i>	--	12	13	--	63	8	--	--	--
	California armina	<i>Armina californica</i>	--	--	--	--	25	15	5	--	--
	tunicates	<i>Ascidacea</i>	--	--	--	10	6	--	--	7	--
	spindle topsnail	<i>Calliostoma turbinum</i>	--	--	--	10	25	4	--	--	--
	icy tunicate	<i>Corella willmeriana</i>	--	--	--	33	--	--	--	--	--
	California frogsnail	<i>Crossata californica</i>	--	--	--	--	--	10	--	--	--
	bull sculpin	<i>Enophrys taurina</i>	--	--	--	33	--	2	--	--	--
	California blade barnacle	<i>Hamatoscalpellum californicu</i>	--	--	--	24	13	44	5	3	--
	blood star	<i>Henricia leviuscula</i>	--	--	--	24	--	--	--	--	--
	Kellett whelk	<i>Kelletia kelletii</i>	--	--	6	5	--	8	--	--	--
	urn sponge	<i>Leucilla nuttingi</i>	--	--	--	--	--	8	--	3	--
	California market squid	<i>Loligo opalescens</i>	--	12	--	5	50	19	25	--	--
	pink sea whip	<i>Lophogorgia chilensis</i>	--	--	--	5	--	8	--	--	--
	moss crab	<i>Loxorhynchus crispatus</i>	--	--	6	5	--	6	--	7	6
	mosaic sand star	<i>Luidia armata</i>	--	--	6	5	6	17	--	3	--
	tower snail	<i>Megasurcula carpenteriana</i>	--	4	--	--	31	8	--	--	--
	brown cup coral	<i>Paracyathus stearnsii</i>	--	--	13	14	--	2	--	--	--
	sunflower star	<i>Pycnopodia helianthoides</i>	--	--	--	48	--	--	--	--	--
	blackeye goby	<i>Rhinogobiops nicholsii</i>	--	--	6	14	--	6	--	--	--
	banded sea star	<i>Sclerasterias heteropaes</i>	--	--	--	29	--	--	--	--	--
	pink rockfish	<i>Sebastes eos</i>	--	28	6	10	56	6	--	--	--

D10. (continued)

			Site Cluster								
			2	1	7	6	8	9	4	5	3
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle / Inner Shelf	Inner Shelf/ B&H N/C	Inner Shelf	B&H C/S
			18	25	16	21	16	48	20	30	16
Depth Range (m)			225-476	132-322	80-192	45-130	57-101	15-86	4-71	7-34	2-12
Species	Cluster	Common Name	Scientific Name								
		chillipepper	<i>Sebastes goodei</i>	--	8	31	43	6	4	5	3
		shortbelly rockfish	<i>Sebastes jordani</i>	6	28	13	38	6	8	--	--
		cowcod	<i>Sebastes levis</i>	--	4	19	48	31	6	5	--
		sea-squirt	<i>Styela sp</i>	--	--	--	19	--	--	5	--
		fish-eating star	<i>Stylasterias forreri</i>	6	12	--	24	--	--	--	--
G		slender sea pen	<i>Stylatula elongata</i>	--	--	6	10	19	25	20	--
		yellow sea twig	<i>Thesea sp b</i>	--	4	25	33	50	42	--	3
		rosy tritonia	<i>Tritonia diomedea</i>	--	4	6	52	19	8	5	--
		sea pen	<i>Virgularia agassizi</i>	--	--	--	--	6	4	15	--
		California sea pen	<i>Virgularia californica</i>	--	4	--	14	--	6	--	10
		fantail sole	<i>Xystreurus liolepis</i>	--	--	--	--	--	17	5	37

C = Central; N = Northern; S = Southern; B&H = Bays/Harbors; POTW = Publicly owned treatment work monitoring area.

D11. Abundance of demersal fish and megabenthic invertebrate species in each site cluster on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003.

Species Cluster	Common Name	Scientific Name	Site Cluster									Total Count
			2	1	7	6	8	9	4	5	3	
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle/ Inner Shelf	Inner Shelf/B&H N/C	Inner Shelf	B&H C/S	
			Number of Stations									
			18	25	16	21	16	48	20	30	16	210
A	trallitip sea pen	<i>Acanthoptilum sp</i>	1	11	357	510	673	1,630	118	3	370	3,673
	California sand star	<i>Astropecten verrilli</i>		1	18	13	104	1,113	1	514		1,764
	roughback sculpin	<i>Chitonotus pugetensis</i>				46	22	439		9		516
	Pacific sanddab	<i>Citharichthys sordidus</i>	19	1,114	3,204	4,375	2,961	5,012	175	198		17,058
	speckled sanddab	<i>Citharichthys stigmaeus</i>		1		395	1	2,927	174	3,283	4	6,785
	longfin sanddab	<i>Citharichthys xanthostigma</i>		2	4		279	903	9	59		1,256
	Alaska bay shrimp	<i>Crangon alaskensis</i>				5	18	69	25			117
	bigmouth sole	<i>Hippoglossina stomata</i>		6	5	11	13	106	6	9		156
	yellowchin sculpin	<i>Icelinus quadriseriatus</i>			1	237	873	2,463	334	54		3,962
	bay goby	<i>Lepidogobius lepidus</i>			1	6	173	167	109			456
	gray sand star	<i>Luidia foliolata</i>	13	84	30	61	39	96	3	1		327
	white sea urchin	<i>Lytechinus pictus</i>		6	5,132	17,465	4,710	5,617		94	4	33,028
	red sea star	<i>Mediaster aequalis</i>	174	78	8	148	1	3				412
	Dover sole	<i>Microstomus pacificus</i>	244	531	250	387	362	327	108	27		2,236
	red octopus	<i>Octopus rubescens</i>		55	34	90	64	121	17	41		422
	pygmy poacher	<i>Odontopyxis trispinosa</i>		1	3	32	6	51	3	17		113
	lingcod	<i>Ophiodon elongatus</i>		2		22	3	37	17	19		100
	Pacific spiny brittlestar	<i>Ophiothrix spiculata</i>		4		573	5	861	2	3		1,448
	brittle star	<i>Ophiura luetkenii</i>		3	32	75	78	278	19			485
	California sea cucumber	<i>Parastichopus californicus</i>		10	15	86	133	316	3	5	2	570
	English sole	<i>Parophrys vetulus</i>	4	204	6	91	25	157	153	185		825
	California sea slug	<i>Pleurobranchaea californica</i>	17	35	15	25	11	15	1	2		121
	curfin sole	<i>Pleuronichthys decurrens</i>			10	161		19		171		361
	hornyhead turbot	<i>Pleuronichthys verticalis</i>		14	1	38	32	269	68	62		484
	plainfin midshipman	<i>Porichthys notatus</i>		123	104	174	122	159	75	1		758
	California scorpionfish	<i>Scorpaena guttata</i>		1		8	2	139	9	9		168
	stripetail rockfish	<i>Sebastes saxicola</i>		1,606	220	1,105	521	274	128	3		3,857
	halfbanded rockfish	<i>Sebastes semicinctus</i>		30	134	1,536	180	807	5			2,692
	California tonguefish	<i>Symphurus atricaudus</i>					127	347	64	15	4	557
	pink seaperch	<i>Zalembeius rosaceus</i>		3	26	76	120	454	500	113		1,292
	longspine combfish	<i>Zaniolepis latipinnis</i>		31	56	829	527	1,327	273	16		3,059
B	sablefish	<i>Anoplopoma fimbria</i>	34	4								38
	sea mouse	<i>Aphrodita sp</i>	41	1		2	1	1				46
	ophiroid	<i>Asteronyx longifissus</i>	9,169	3								9,172
	northern heart urchin	<i>Brisaster latifrons</i>	28,938	7,132		4						36,074
	Pacific hagfish	<i>Eptatretus stoutii</i>	8	2								10
	dogface witch eel	<i>Facciolella equatorialis</i>	33									33
	sea pen	<i>Halipteris californica</i>	44		2				1			47
	bigfin eelpout	<i>Lycodes corteziensis</i>	58	14								72
	sea star	<i>Myxoderma platyacanthum</i>	9,460	1,111								10,571
	holothuroid	<i>Pannychia moseleyi</i>	539	2								541
	filetail cat shark	<i>Parmaturus xaniurus</i>	10	2								12
	sponge	<i>Porifera</i>	1,568	3	4	6	1	31		1	16	1,630
	sea star	<i>Pseudarchaster pusillus</i>	153	1								154
	shortspine thornyhead	<i>Sebastolobus alascanus</i>	163	13								176
	California heart urchin	<i>Spatangus californicus</i>	2,194	1,416	4	3						3,617
	offshore blade shrimp	<i>Spirontocaris sica</i>	273	236								509
	northern lampfish	<i>Stenobrachius leucopsarus</i>	54	2								56
signet ring anemone	<i>Stephanauge annularis</i>	57	1	1							59	
C	slough anchovy	<i>Anchoa delicatissima</i>									362	362
	Pacific calico scallop	<i>Argopecten ventricosus</i>									66	66
	yellow-green sea squirt	<i>Ciona intestinalis</i>								14	356	370
	kelp scallop	<i>Leptopecten latiauratus</i>								12	76	88
	warty tunicate	<i>Molgula verrucifera</i>									440	440
	mat mussel	<i>Musculista senhousia</i>									508	508
	mussel	<i>Mytilus sp</i>							6		46	52
	California aglaja	<i>Navanax inermis</i>							6	2	50	58
	spotted sand bass	<i>Paralabrax maculatofasciatus</i>									18	18
	barred sand bass	<i>Paralabrax nebulifer</i>						1		1	118	121
	diamond turbot	<i>Pleuronichthys guttulatus</i>								3	26	29
	tuberculate sea squirt	<i>Styela clava</i>			1	1					20	22
	cobblestone sea squirt	<i>Styela plicata</i>									598	598
	round stingray	<i>Urobatis halleri</i>							4		248	252

D11. (continued)

			Site Cluster									Total Count
			2	1	7	6	8	9	4	5	3	
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle/ Inner Shelf	Inner Shelf/B&H N/C	Inner Shelf	B&H C/S	
			Number of Stations									
Species Cluster	Common Name	Scientific Name	18	25	16	21	16	48	20	30	16	210
D	orange sand star	<i>Astropecten ornatissimus</i>		113	8	5						126
	spotted cusk-eel	<i>Chilara taylori</i>	1	14	79	76	4	11		1		186
	Adam spiny margarite	<i>Cidarina cidaris</i>		1	9	1						11
	feather star	<i>Florometra serratissima</i>		1	202	13	8					224
	basket star	<i>Gorgonocephalus eucnemis</i>		5	23							28
	spotted ratfish	<i>Hydrolagus collieri</i>	1	6	8							15
	spotfin sculpin	<i>Icelinus tenuis</i>			54	45	1	3				103
	brown box crab	<i>Lopholithodes foraminatus</i>		5	21	1						27
	fringed sand star	<i>Luidia asthenosoma</i>	1	1	7	8	7	1		2		27
	gigantic anemone	<i>Metridium farcimen</i>	1	36	7	3	3					50
	pycnogonid	<i>Nymphon pixellae</i>		3	34	1						38
	roughspine brittlestar	<i>Ophiopholis bakeri</i>	12	13	41	65	1					132
	slenderclaw hermit	<i>Paguristes turgidus</i>		6	1	2		2				11
	white paperbubble	<i>Philine alba</i>	3		59	124	1	1				188
	armed box crab	<i>Platymera gaudichaudii</i>		7	21	5	2	4	8	1		48
	greenstriped rockfish	<i>Sebastes elongatus</i>		14	65	17	23	1				120
	greenblotched rockfish	<i>Sebastes rosenblatti</i>		21	37	1	22	1	1			83
	bluespotted poacher	<i>Xeneretmus triacanthus</i>		1	22	14	9					46
	shortspine combfish	<i>Zaniolepis frenata</i>	5	432	412	179	56	71				1,155
E	fragile sea urchin	<i>Allocentrotus fragilis</i>	3,935	15,897	897	181	6	1				20,917
	Pacific heart urchin	<i>Brissoopsis pacifica</i>	8,094	450	3	14	7					8,568
	Crawford nutmeg	<i>Cancellaria crawfordiana</i>	3	1	5		1					10
	sea dandelion	<i>Dromalia alexandri</i>	71	347	1							419
	rex sole	<i>Glyptocephalus zachirus</i>	31	453	8		1					493
	blackbelly eelpout	<i>Lycodes pacificus</i>		705	12	13	16					746
	bearded eelpout	<i>Lyconema barbatum</i>	3	253	3	3						262
	slender sole	<i>Lyopsetta exilis</i>	328	4,038	164	1	27	1				4,559
	Pacific hake	<i>Merluccius productus</i>	107	121	3							231
	southern spinyhead	<i>Metacrangon spinosissima</i>		18	2		4					24
	smooth western nassa	<i>Nassarius insculptus</i>		7	8			1				16
	gray shrimp	<i>Neocrangon communis</i>	1	432								433
	flagnose bay shrimp	<i>Neocrangon resima</i>		61	3	1		1				66
	moustache bay shrimp	<i>Neocrangon zacaee</i>	5	404	31	3	131	22				596
	orange bigeye octopus	<i>Octopus californicus</i>	40	60					3			103
	ocean shrimp	<i>Pandalus jordani</i>		809	1							810
	spot shrimp	<i>Pandalus platyceros</i>	10	86	2	12	112	35	16			273
	bluebarred prickleback	<i>Plectobranthus evides</i>		60	1	4	1					66
	eastern Pacific bobtail	<i>Rossia pacifica</i>	4	120	17	3	27	14	3			188
	splitnose rockfish	<i>Sebastes diploproa</i>	54	1,194			1					1,249
ridgeback rock shrimp	<i>Sicyonia ingentis</i>		3,682	23	141	51	219	59			4,175	
slender blade shrimp	<i>Spirontocaris holmesi</i>	26	982								1,008	
blacktip poacher	<i>Xeneretmus latifrons</i>	4	285	90	1	6					386	
F	spiny sand star	<i>Astropecten armatus</i>							2	24	6	32
	graceful rock crab	<i>Cancer gracilis</i>						1	12	25	4	42
	blackspotted bay shrimp	<i>Crangon nigromaculata</i>						178	1,701	40		1,919
	shiner perch	<i>Cymatogaster aggregata</i>				4		2	222	17	12	257
	northern anchovy	<i>Engraulis mordax</i>							141		4	145
	Spanish shawl	<i>Flabellina iodinea</i>						10	1	14		25
	white croaker	<i>Genyonemus lineatus</i>						13	839		4	856
	Stimpson coastal shrimp	<i>Heptacarpus stimpsoni</i>						8	24			32
	sandflat elbow crab	<i>Heterocrypta occidentalis</i>				1		1	2	15		19
	spotwrist hermit	<i>Pagurus spilocarpus</i>						5	7	2		14
	California halibut	<i>Paralichthys californicus</i>						15	49	39	95	198
	Pacific pompano	<i>Peprilus simillimus</i>					2		19			21
	white seaperch	<i>Phanerodon furcatus</i>							129	37		166
	New Zealand papperbubble	<i>Philine auriformis</i>		99	9	2	57	269	438	5	2	881
	shortspined sea star	<i>Pisaster brevispinus</i>						3	6	4		13
	spotted turbot	<i>Pleuronichthys ritteri</i>						2	5	14	12	33
	specklefin midshipman	<i>Porichthys myriaster</i>						11	126	7	40	184
	northern kelp crab	<i>Pugettia producta</i>						1	4	35	6	46
	tuberculate pear crab	<i>Pyromaia tuberculata</i>						3	148	8	24	183
	California skate	<i>Raja inornata</i>		1	3	6	9	23	21	1		64
copper rockfish	<i>Sebastes caurinus</i>				1		6	2	58		67	

D11. (continued)

Species Cluster	Common Name	Scientific Name	Site Cluster									Total Count
			2	1	7	6	8	9	4	5	3	
			Upper Slope	Upper Slope/ Outer Shelf	Islands/ Outer Shelf	Channel Islands	Middle Shelf	Middle/ Inner Shelf	Inner Shelf/B&H N/C	Inner Shelf	B&H C/S	
			Number of Stations									
			18	25	16	21	16	48	20	30	16	210
F	calico rockfish	<i>Sebastes dallii</i>			1		1	21				23
	vermillion rockfish	<i>Sebastes miniatus</i>				1		9	3	6		19
	queenfish	<i>Seriphus politus</i>							80	1	186	267
	California lizardfish	<i>Synodus lucioceps</i>					10	58	37	48		153
	maculated triopha	<i>Triopha maculata</i>				6		20	10	1		37
G	brown spiny doris	<i>Acanthodoris brunnea</i>		1	1		2	35	6	2		47
	southern spearnose poacher	<i>Agonopsis sterletus</i>				13		3		3		19
	roughdisk brittlestar	<i>Amphichondrius granulatus</i>			3	19	1					23
	Pacific argentine	<i>Argentina sialis</i>		3	2		144	52				201
	California armina	<i>Armina californica</i>					9	11	1			21
	tunicates	<i>Ascidacea</i>				19	1			2		22
	spindle topsnail	<i>Calliostoma turbinum</i>				5	6	2				13
	icy tunicate	<i>Corella willmeriana</i>				13						13
	California frogsnail	<i>Crossata californica</i>						16				16
	bull sculpin	<i>Enophrys taurina</i>				49		1				50
	California blade barnacle	<i>Hamatoscalpellum californicu</i>				16	21	270	1	1		309
	blood star	<i>Henricia leviuscula</i>				14						14
	Kellet whelk	<i>Kelletia kelletii</i>			1	1		7				9
	urn sponge	<i>Leucilla nuttingi</i>						26		1		27
	California market squid	<i>Loligo opalescens</i>			4		1	339	18	22		384
	pink sea whip	<i>Lophogorgia chilensis</i>				6		4				10
	moss crab	<i>Loxorhynchus crispatus</i>			1	1		8			2	14
	mosaic sand star	<i>Luidia armata</i>			1	2	3	28		1		35
	tower snail	<i>Megasurcula carpenteriana</i>			1			8	5			14
	brown cup coral	<i>Paracyathus stearnsii</i>				12	6		4			22
	sunflower star	<i>Pycnopodia helianthoides</i>					24					24
	blackeye goby	<i>Rhinogobiops nicholsii</i>			1	11		43				55
	banded sea star	<i>Sclerasterias heteropaes</i>					16					16
	pink rockfish	<i>Sebastes eos</i>			8	1	30	21	3			63
	chilipepper	<i>Sebastes goodei</i>			2	7	33	2	12	1	186	243
	shortbelly rockfish	<i>Sebastes jordani</i>		4	19	11	290	1	13			338
	cowcod	<i>Sebastes levis</i>			2	3	34	12	16	2		69
	sea-squirt	<i>Styela sp</i>					4			6		10
	fish-eating star	<i>Stylasterias forreri</i>		1	3		8					12
	slender sea pen	<i>Stylatula elongata</i>				1	2	8	23	7		41
	yellow sea twig	<i>Thesea sp b</i>			1	7	7	22	1,539		1	1,577
	rosy tritonia	<i>Tritonia diomedea</i>			1	1	21	16	9	1		49
	sea pen	<i>Virgularia agassizi</i>						1	4	5		10
	California sea pen	<i>Virgularia californica</i>			1		7		34		3	45
	fantail sole	<i>Xystreureys liolepis</i>							22	1	19	42

C = Central; N = Northern; S = Southern; B&H = Bays/Harbors; POTW = Publicly owned treatment work monitoring area.

D12. Biodiversity indices of demersal fish and megabenthic invertebrates combined by station collected at depths of 2-476 m, July-October 2003.

Station Code	S	N	d	J'	H'(log e)	1-Lambda	Delta	Delta*	Delta+	sDelta+	Lambda+	Phi+	sPhi+
4000SM34N	19	326	3.11	0.46	1.34	0.56	47.08	83.92	83.83	1592.84	626.01	55.31	1050.81
4003NI16S	10	108	1.92	0.47	1.07	0.47	30.19	63.76	71.72	717.23	976.72	49.57	495.73
4004SO144M	28	664	4.15	0.63	2.09	0.83	61.27	73.74	84.92	2377.79	515.57	53.78	1505.81
4006CM59N	40	893	5.74	0.71	2.61	0.89	77.30	86.87	85.86	3434.24	493.84	53.91	2156.54
4007NU452M	12	240	2.01	0.64	1.59	0.69	61.91	90.28	86.50	1038.03	422.29	72.80	873.60
4012SM72L	33	394	5.35	0.72	2.52	0.86	57.85	67.39	84.28	2781.15	513.08	53.00	1748.99
4019NM84N	15	97	3.06	0.64	1.72	0.71	65.40	91.89	81.17	1217.59	709.98	59.35	890.25
4021CM37N	31	394	5.02	0.60	2.05	0.72	64.05	89.48	86.82	2691.31	535.17	50.35	1560.98
4026CM43N	32	1651	4.18	0.42	1.45	0.66	58.21	88.01	84.82	2714.14	550.86	53.62	1715.94
4027WM100I	30	701	4.43	0.66	2.24	0.82	57.15	69.91	81.75	2452.51	676.08	49.13	1474.04
4028SB4P	16	1968	1.98	0.88	2.45	0.91	53.68	59.10	76.77	1228.36	837.69	48.84	781.51
4029EM81I	55	1766	7.22	0.36	1.43	0.48	43.58	89.87	87.89	4833.70	427.26	46.92	2580.36
4030CM42S	34	322	5.71	0.68	2.41	0.86	64.46	75.09	83.31	2832.40	643.38	45.59	1549.94
4035NM71N	26	189	4.77	0.81	2.62	0.90	77.98	86.22	85.30	2217.78	587.60	50.02	1300.42
4036SM47N	33	434	5.27	0.67	2.33	0.84	52.44	62.37	84.67	2793.99	609.37	50.88	1679.14
4037CM60N	26	507	4.01	0.60	1.97	0.77	46.76	61.06	80.39	2090.03	642.89	52.14	1355.72
4038CO132L	26	1465	3.43	0.27	0.89	0.33	31.89	95.64	78.07	2029.77	843.43	44.17	1148.39
4039NU426M	18	2254	2.20	0.14	0.40	0.15	10.68	72.73	90.64	1631.44	333.96	67.01	1206.21
4040SM57S	31	489	4.84	0.64	2.19	0.82	46.56	56.80	78.56	2435.35	638.03	48.38	1499.69
4041CM81L	31	1948	3.96	0.48	1.64	0.69	61.78	89.95	83.49	2588.27	596.93	49.46	1533.30
4042CI24L	25	872	3.54	0.39	1.25	0.48	20.80	43.48	78.81	1970.21	605.91	52.11	1302.72
4043NI18M	11	198	1.89	0.49	1.17	0.48	28.35	59.51	73.61	809.76	755.21	58.49	643.35
4045CM58L	28	404	4.50	0.60	1.99	0.75	49.81	66.64	84.09	2354.49	584.77	53.46	1496.99
4047NI25S	13	73	2.80	0.72	1.84	0.75	42.91	57.16	68.22	886.90	878.31	48.86	635.22
4048SM72N	27	1448	3.57	0.37	1.22	0.53	52.42	98.13	85.57	2310.26	519.67	57.40	1549.77
4050CB25P	24	432	3.79	0.73	2.31	0.85	71.41	84.26	86.65	2079.55	470.49	56.80	1363.27
4051EM87I	28	443	4.43	0.66	2.20	0.81	56.32	69.53	81.72	2288.09	640.70	50.72	1420.26
4055NI18S	15	510	2.25	0.41	1.11	0.47	17.27	37.04	56.03	840.51	456.72	39.47	592.08
4057CO138M	20	395	3.18	0.65	1.95	0.75	44.27	58.78	79.19	1583.82	628.23	55.29	1105.78
4058CI28M	19	205	3.38	0.51	1.50	0.57	24.61	43.23	74.21	1410.06	785.69	48.13	914.55
4061NI14M	8	149	1.40	0.46	0.95	0.49	44.69	91.22	82.92	663.34	891.35	63.94	511.53
4062SI23S	11	46	2.61	0.77	1.84	0.81	61.20	75.68	61.96	681.54	969.41	49.26	541.84
4064SI26S	9	343	1.37	0.39	0.87	0.47	37.85	80.55	82.63	743.71	669.35	66.62	599.54
4065CB6A	18	284	3.01	0.55	1.58	0.61	58.66	96.70	87.34	1572.12	545.88	56.27	1012.95
4068SO184M	21	423	3.31	0.66	2.00	0.82	70.53	86.54	84.09	1765.85	565.37	57.05	1198.08
4070CM72L	34	739	5.00	0.70	2.46	0.87	62.77	72.15	83.40	2835.45	626.57	49.47	1681.91
4071NU287M	24	1262	3.22	0.43	1.37	0.53	46.16	86.99	87.98	2111.50	462.05	56.54	1356.96
4073CM38L	29	938	4.09	0.57	1.92	0.77	73.27	94.90	88.75	2573.61	436.35	54.77	1588.47
4077CM56L	33	507	5.14	0.66	2.32	0.82	58.29	71.01	85.33	2816.03	537.40	52.12	1719.93
4079NM36N	19	186	3.44	0.70	2.05	0.81	57.78	71.35	72.00	1367.93	738.52	44.62	847.85
4080SM63N	26	407	4.16	0.76	2.49	0.89	51.82	58.08	77.90	2025.44	714.63	51.03	1326.88
4083NU258M	17	798	2.39	0.51	1.43	0.63	51.93	82.88	89.40	1519.81	481.77	62.17	1056.91
4086CM93N	46	2342	5.80	0.45	1.71	0.61	57.50	93.62	83.85	3856.99	572.76	48.28	2220.84
4088SU469M	28	1866	3.58	0.32	1.06	0.45	34.46	77.41	91.35	2557.69	328.61	59.09	1654.66
4090CI28M	21	356	3.40	0.38	1.17	0.41	23.11	56.02	80.78	1696.37	773.24	46.86	983.99
4091NU428M	16	10954	1.61	0.42	1.16	0.66	49.48	75.08	92.19	1475.05	242.22	73.67	1178.67
4092SB4P	8	44	1.85	0.79	1.64	0.75	70.54	94.25	89.90	719.20	455.82	74.27	594.17
4094SI20S	14	72	3.04	0.51	1.35	0.53	49.53	93.50	72.71	1017.98	774.61	48.85	683.93
4096SM80N	46	4012	5.42	0.11	0.43	0.16	15.38	97.52	85.09	3914.02	606.94	45.34	2085.69
4097CB2A	19	138	3.65	0.90	2.64	0.92	72.44	78.86	82.86	1574.28	485.37	55.86	1061.35
4098CB11P	12	244	2.00	0.50	1.23	0.48	30.65	63.45	75.77	909.19	599.67	62.92	755.03
4099NM72N	27	225	4.80	0.74	2.44	0.87	70.49	80.62	78.89	2130.09	714.06	49.50	1336.53

D12. (continued)

Station Code	S	N	d	J'	H'(log e)	1-Lambda	Delta	Delta*	Delta+	sDelta+	Lambda+	Phi+	sPhi+
4101CM38N	30	360	4.93	0.59	2.01	0.79	64.56	81.41	83.91	2517.22	595.57	50.87	1526.24
4102CM42L	23	562	3.47	0.71	2.23	0.84	52.20	62.40	76.87	1767.93	637.77	50.91	1170.90
4109CM44L	24	315	4.00	0.72	2.28	0.85	59.92	70.62	79.39	1905.47	701.44	52.60	1262.34
4110CO156M	33	1358	4.44	0.57	1.99	0.72	60.55	83.52	85.29	2814.67	553.17	47.28	1560.26
4113CM40N	33	1192	4.52	0.63	2.19	0.82	70.38	85.87	81.10	2676.46	649.34	49.61	1637.23
4115EM86I	36	3041	4.36	0.21	0.74	0.26	25.64	96.93	85.74	3086.54	549.82	52.55	1891.88
4116SB4P	15	710	2.13	0.59	1.61	0.76	46.50	61.56	80.65	1209.78	446.07	57.22	858.32
4117CB4A	5	44	1.06	0.64	1.03	0.52	31.20	60.48	65.22	326.09	287.05	64.82	324.11
4119NI20M	12	344	1.88	0.49	1.23	0.53	30.24	57.00	70.14	841.66	823.59	49.69	596.25
4120SM86L	30	299	5.09	0.66	2.23	0.80	52.39	65.14	85.18	2555.51	516.48	55.94	1678.19
4122CM47N	18	1893	2.25	0.28	0.82	0.38	35.92	95.00	84.55	1521.92	590.68	56.81	1022.65
4123NM56N	41	938	5.84	0.55	2.05	0.71	63.26	89.15	85.36	3499.60	619.45	44.25	1814.07
4125NU394M	34	7415	3.70	0.40	1.42	0.71	37.24	52.67	90.14	3064.81	396.09	54.04	1837.30
4128SI22M	10	142	1.82	0.47	1.07	0.57	54.72	96.49	88.59	885.85	719.22	63.06	630.57
4129CB4A	18	132	3.48	0.78	2.25	0.82	69.10	84.44	84.97	1529.45	494.23	59.33	1067.97
4131NB6A	6	178	0.96	0.57	1.02	0.58	22.17	38.41	83.39	500.34	851.62	65.75	394.47
4132SU377M	20	444	3.12	0.55	1.64	0.73	60.74	83.12	83.14	1662.89	612.38	54.39	1087.83
4133NO197M	30	3520	3.55	0.42	1.41	0.59	54.21	91.74	84.18	2525.49	621.93	44.24	1327.25
4134CM76N	36	1013	5.06	0.60	2.16	0.82	66.41	80.56	79.21	2851.63	751.52	46.11	1660.12
4135NU382M	17	449	2.62	0.48	1.37	0.60	49.32	82.40	88.83	1510.04	387.51	69.40	1179.76
4137CM56L	15	238	2.56	0.39	1.05	0.44	41.70	95.55	72.30	1084.52	792.05	53.86	807.88
4138CB10A	13	245	2.18	0.56	1.45	0.67	64.05	96.30	85.41	1110.29	434.15	64.68	840.78
4141CM56L	36	606	5.46	0.62	2.23	0.81	55.87	68.85	84.67	3048.28	578.09	50.99	1835.76
4143NI24M	18	137	3.46	0.77	2.22	0.83	54.57	65.53	74.52	1341.40	675.21	55.26	994.72
4144SU210M	26	1902	3.31	0.49	1.58	0.66	60.38	90.97	86.02	2236.41	574.27	51.05	1327.22
4148SB12P	14	146	2.61	0.70	1.85	0.76	56.55	74.64	81.79	1145.05	426.84	60.56	847.84
4149CB6A	6	20	1.67	0.84	1.50	0.74	60.60	82.24	87.06	522.35	479.88	74.92	449.50
4150CM60N	41	1012	5.78	0.78	2.90	0.93	79.07	85.24	83.98	3443.24	594.57	48.71	1997.10
4152SM90S	36	312	6.09	0.61	2.18	0.80	68.60	85.69	86.95	3130.33	530.15	51.50	1853.99
4154CM34N	13	596	1.88	0.41	1.05	0.48	43.23	90.79	71.80	933.42	1152.58	46.56	605.29
4155WM100I	28	500	4.34	0.52	1.73	0.68	44.43	65.78	87.02	2436.64	483.14	53.86	1508.09
4156SB8A	13	78	2.75	0.74	1.91	0.76	62.51	82.34	85.49	1111.33	470.97	69.70	906.05
4158SI11M	8	126	1.45	0.66	1.37	0.63	42.23	67.05	67.09	536.70	1050.71	56.28	450.24
4159WM72I	30	652	4.48	0.64	2.19	0.80	42.44	53.22	82.11	2463.20	684.22	51.28	1538.42
4162CB15P	10	190	1.72	0.45	1.04	0.43	21.92	50.91	69.41	694.11	631.49	59.84	598.37
4163EO130I	33	744	4.84	0.60	2.09	0.81	73.69	90.98	85.00	2804.97	568.64	49.03	1617.85
4164SM101N	25	413	3.98	0.36	1.15	0.41	25.87	63.84	79.46	1986.58	669.17	51.37	1284.16
4165CM34N	18	319	2.95	0.67	1.93	0.79	62.19	78.63	77.04	1386.64	744.13	53.60	964.78
4166CM68L	26	610	3.90	0.65	2.11	0.84	43.81	52.42	75.94	1974.44	787.52	44.53	1157.91
4170CI25L	20	828	2.83	0.28	0.85	0.33	12.40	37.70	79.05	1580.93	704.87	55.17	1103.46
4172SM46N	29	483	4.53	0.64	2.14	0.81	46.69	57.40	85.01	2465.37	583.67	53.06	1538.83
4173CM104N	34	2145	4.30	0.29	1.04	0.40	34.21	86.11	89.88	3056.08	380.54	56.85	1933.06
4177CB5A	18	180	3.27	0.85	2.47	0.89	74.50	83.28	86.53	1557.55	461.19	54.83	987.01
4179NU364M	27	11121	2.79	0.12	0.41	0.14	8.74	60.57	92.11	2487.05	301.67	63.58	1716.53
4180SB2P	7	215	1.12	0.30	0.59	0.25	16.27	65.81	64.00	447.99	113.93	62.37	436.61
4181CI12M	11	234	1.83	0.35	0.84	0.34	20.36	60.71	81.91	900.98	863.99	61.52	676.69
4183NM34S	25	345	4.11	0.63	2.04	0.75	38.21	50.99	74.61	1865.17	793.36	45.71	1142.80
4184SM91L	28	962	3.93	0.54	1.79	0.74	63.08	85.11	74.40	2083.33	695.64	49.38	1382.65
4187NU202M	28	2783	3.40	0.61	2.05	0.83	73.65	88.58	87.17	2440.68	504.55	52.08	1458.22
4189NI18M	7	66	1.43	0.57	1.10	0.51	24.46	47.62	59.28	414.95	849.54	48.57	339.96
4193CB5A	20	288	3.36	0.51	1.52	0.55	53.77	98.21	92.46	1849.28	333.55	65.69	1313.88
4199NU456M	27	7449	2.92	0.26	0.87	0.51	38.64	76.15	89.91	2427.54	375.97	65.25	1761.86
4200SM58S	31	540	4.77	0.61	2.09	0.80	44.21	55.15	83.16	2577.96	550.56	51.23	1588.05
4201CU341M	21	2188	2.60	0.49	1.48	0.67	46.79	70.18	90.25	1895.27	387.31	61.84	1298.70

D12. (continued)

Station Code	S	N	d	J'	H'(log e)	1-Lambda	Delta	Delta*	Delta+	sDelta+	Lambda+	Phi+	sPhi+
4202CU264M	14	2803	1.64	0.15	0.39	0.14	13.62	95.05	83.58	1170.16	732.25	54.51	763.18
4203NI24M	14	93	2.87	0.62	1.65	0.67	34.91	52.40	64.34	900.76	582.28	49.38	691.34
4204SB7A	8	50	1.79	0.90	1.87	0.84	77.26	92.43	90.26	722.05	353.07	72.31	578.51
4205CM66L	27	683	3.98	0.60	1.98	0.74	60.40	81.82	81.84	2209.57	628.75	51.66	1394.70
4207NI24S	15	105	3.01	0.70	1.89	0.77	44.93	58.54	69.25	1038.75	605.52	52.40	785.95
4208SI8M	7	23	1.91	0.76	1.48	0.71	47.39	66.97	71.49	500.46	1011.80	55.12	385.87
4210CB18P	33	2486	4.09	0.48	1.69	0.62	56.83	92.24	86.44	2852.45	457.27	53.48	1764.68
4211NU388M	25	8540	2.65	0.30	0.96	0.41	29.08	71.19	93.68	2342.11	214.87	70.09	1752.27
4212SB3A	6	88	1.12	0.34	0.61	0.25	17.28	68.32	68.24	409.44	121.60	66.36	398.17
4215NI22S	16	473	2.44	0.43	1.19	0.51	19.71	38.61	71.00	1135.96	824.05	48.65	778.42
4222SM40S	16	228	2.76	0.72	2.01	0.82	63.79	77.42	72.74	1163.79	680.05	54.57	873.08
4227NO136M	6	112	1.06	0.39	0.70	0.32	27.27	85.91	77.44	464.66	842.42	68.69	412.15
4230CM54L	32	379	5.22	0.73	2.54	0.87	62.82	71.88	84.39	2700.43	610.84	47.96	1534.66
4232SM76S	25	216	4.46	0.67	2.16	0.77	49.11	63.97	84.97	2124.20	553.86	56.05	1401.36
4235WM54I	59	1431	7.98	0.64	2.61	0.86	75.01	87.71	88.35	5212.65	481.06	46.10	2720.08
4237NU225M	15	76	3.23	0.79	2.14	0.85	69.35	81.44	88.32	1324.86	460.95	66.10	991.48
4238CI22S	12	59	2.70	0.70	1.74	0.74	60.48	81.74	75.59	907.11	1055.79	50.57	606.79
4239NU322M	31	974	4.36	0.43	1.49	0.55	45.06	81.26	90.28	2798.81	382.29	55.68	1725.95
4240SU248M	32	1865	4.12	0.58	2.00	0.77	71.34	92.86	86.70	2774.35	569.38	48.10	1539.20
4241CM32L	28	312	4.70	0.74	2.48	0.89	66.24	74.64	83.42	2335.89	650.14	53.79	1506.11
4243EM86I	29	454	4.58	0.64	2.16	0.81	72.53	89.17	83.01	2407.16	640.85	51.69	1498.91
4244SM58L	29	571	4.41	0.63	2.11	0.76	48.31	63.19	81.74	2370.37	611.73	52.58	1524.88
4248SM59L	30	704	4.42	0.66	2.26	0.81	54.62	67.31	83.30	2499.06	629.65	49.21	1476.37
4253NI16S	6	279	0.89	0.43	0.77	0.46	27.24	58.68	77.44	464.66	842.42	68.69	412.15
4254CU454M	21	2802	2.52	0.14	0.42	0.14	11.23	78.19	88.96	1868.15	378.84	59.77	1255.08
4255WU202I	33	885	4.72	0.66	2.30	0.86	45.06	52.39	81.81	2699.59	636.22	45.97	1516.95
4256SM38N	48	637	7.28	0.69	2.69	0.89	68.89	77.20	88.31	4238.76	512.56	47.03	2257.56
4259NI12S	10	18	3.11	0.94	2.17	0.92	78.92	85.63	86.60	865.95	590.19	63.20	631.98
4260SO124M	35	413	5.64	0.65	2.31	0.82	63.33	76.99	85.15	2980.35	587.59	52.66	1843.17
4261NU319M	21	719	3.04	0.43	1.31	0.49	43.08	87.06	79.45	1668.46	698.22	48.66	1021.91
4263NU476M	13	938	1.75	0.33	0.84	0.41	40.75	99.96	90.91	1181.89	338.89	73.51	955.65
4265CM38L	45	1200	6.21	0.57	2.18	0.79	73.26	92.79	90.12	4055.29	407.45	54.33	2445.06
4267NI30M	27	497	4.19	0.66	2.16	0.80	56.21	69.91	70.04	1891.09	658.42	44.09	1190.35
4269CO155M	20	2383	2.44	0.44	1.32	0.61	57.97	94.84	84.75	1695.05	600.17	53.59	1071.83
4277CM52L	30	538	4.61	0.70	2.38	0.86	54.91	63.87	81.68	2450.51	684.89	45.86	1375.71
4279NU204M	31	1515	4.10	0.65	2.23	0.82	73.48	89.41	83.84	2599.08	611.30	45.93	1423.84
4280SM41S	19	158	3.56	0.70	2.06	0.79	53.29	67.38	88.66	1684.55	480.16	59.14	1123.74
4285NO198M	10	47	2.34	0.47	1.08	0.44	24.56	55.31	68.63	686.25	696.14	58.07	580.69
4286CM40S	31	287	5.30	0.69	2.38	0.85	55.22	64.86	86.30	2675.24	609.49	47.55	1474.04
4290CI24M	15	352	2.39	0.45	1.22	0.61	55.75	91.86	76.48	1147.22	572.36	60.68	910.22
4291NI29M	27	457	4.25	0.59	1.94	0.74	49.80	67.17	73.35	1980.42	646.88	45.06	1216.59
4294CI28L	25	575	3.78	0.44	1.43	0.60	52.72	87.59	86.02	2150.40	629.69	54.81	1370.29
4295NU402M	21	4584	2.37	0.49	1.48	0.73	66.32	90.57	88.14	1851.02	382.29	65.62	1377.93
4296SM49S	27	414	4.31	0.77	2.53	0.89	54.91	62.00	77.08	2081.10	704.20	50.16	1354.21
4300SI14M	18	130	3.49	0.49	1.43	0.53	33.71	63.14	80.13	1442.31	843.31	48.53	873.55
4309CI14M	18	105	3.65	0.48	1.39	0.52	33.80	64.74	84.89	1528.06	654.54	58.68	1056.29
4312SM120L	30	762	4.37	0.46	1.56	0.66	58.35	88.25	87.99	2639.65	489.57	50.13	1503.98
4315NI20M	14	508	2.09	0.32	0.83	0.31	15.51	49.61	76.69	1073.72	876.03	53.05	742.63
4317NI28M	10	46	2.35	0.78	1.80	0.79	37.84	47.71	72.86	728.57	859.63	55.08	550.75
4320SI20S	12	86	2.47	0.51	1.28	0.60	54.78	91.00	82.75	993.04	767.08	60.45	725.36
4323NO152M	11	86	2.24	0.40	0.96	0.39	37.18	95.90	79.58	875.38	698.05	60.95	670.42
4326CM41L	26	2259	3.24	0.26	0.84	0.30	27.78	93.33	83.21	2163.54	616.40	51.85	1348.01
4327NU433M	16	4910	1.76	0.29	0.80	0.46	35.05	76.44	84.58	1353.21	448.34	63.53	1016.48
4328SI30S	20	177	3.67	0.72	2.15	0.83	63.79	76.63	82.07	1641.36	623.19	57.15	1143.10

D12. (continued)

Station Code	S	N	d	J'	H'(log e)	1-Lambda	Delta	Delta*	Delta+	sDelta+	Lambda+	Phi+	sPhi+
4329CU228M	25	1988	3.16	0.64	2.05	0.79	69.29	87.90	87.19	2179.79	568.84	52.71	1317.84
4331NI21M	11	72	2.34	0.62	1.49	0.65	39.55	61.20	82.08	902.91	587.95	63.51	698.64
4336SI24M	13	82	2.72	0.72	1.84	0.77	61.87	80.54	66.67	866.67	961.44	51.63	671.16
4339EM64I	45	726	6.68	0.53	2.01	0.78	53.88	69.12	80.69	3631.19	765.46	45.09	2029.00
4343NO192M	37	5654	4.17	0.44	1.60	0.63	46.40	74.09	87.21	3226.89	536.95	46.92	1736.17
4347WM110I	42	1023	5.92	0.46	1.72	0.66	42.48	64.58	87.95	3693.74	485.46	51.86	2178.31
4349NI28M	7	29	1.78	0.84	1.63	0.80	65.24	81.75	74.86	524.02	964.51	62.70	438.87
4350SM36S	12	116	2.31	0.87	2.17	0.88	56.79	64.64	70.80	849.59	833.80	54.96	659.52
4351WM52I	32	1199	4.37	0.29	0.99	0.39	13.61	35.13	84.46	2702.77	594.67	50.50	1616.14
4356SU463M	25	208	4.50	0.74	2.37	0.85	77.25	91.01	82.87	2071.72	499.06	55.53	1388.30
4365CM48L	29	298	4.91	0.71	2.40	0.84	52.89	63.06	79.04	2292.03	707.73	44.55	1291.95
4366CI28S	19	77	4.14	0.80	2.35	0.87	62.24	71.70	85.58	1626.00	654.33	54.29	1031.45
4367NI16M	18	272	3.03	0.50	1.44	0.56	41.14	73.68	81.68	1470.31	633.97	53.73	967.08
4369CM56L	30	883	4.28	0.58	1.96	0.77	65.19	84.91	76.74	2302.29	704.92	47.98	1439.30
4371EM80I	35	5665	3.93	0.13	0.46	0.15	14.16	95.86	83.98	2939.17	586.75	50.18	1756.25
4374CI12M	19	253	3.25	0.51	1.49	0.55	37.34	67.47	81.89	1555.88	878.75	45.96	873.20
4376SM92L	33	2950	4.01	0.36	1.27	0.57	55.15	97.38	85.02	2805.80	569.04	50.05	1651.50
4381NI12S	14	185	2.49	0.53	1.39	0.58	41.27	71.44	85.38	1195.29	620.14	59.01	826.18
4384SM41S	26	188	4.77	0.76	2.49	0.89	62.46	70.41	82.16	2136.23	604.19	51.98	1351.43
4400CB17P	18	248	3.08	0.65	1.88	0.77	67.74	87.65	82.86	1491.57	499.39	62.96	1133.27
4402SI14M	18	288	3.00	0.76	2.21	0.85	63.52	74.33	73.19	1317.49	715.98	49.67	894.10
4404CB5A	16	1161	2.13	0.58	1.60	0.70	63.70	91.33	86.91	1390.60	396.04	61.66	986.54
4408CB11P	12	94	2.42	0.35	0.87	0.33	18.92	57.72	77.24	926.90	582.80	60.42	725.09
4417WM45I	45	363	7.46	0.73	2.79	0.90	65.36	72.96	91.12	4100.20	360.86	53.19	2393.43
4418SB5A	7	242	1.09	0.33	0.64	0.30	28.97	95.83	84.65	592.53	383.45	71.17	498.17
4419NO128M	5	10	1.74	0.88	1.42	0.80	38.69	48.36	39.28	196.42	241.88	46.24	231.20
4421WM95I	32	1387	4.28	0.33	1.15	0.41	27.08	65.35	87.37	2795.98	583.65	51.17	1637.53
4423CB4A	15	164	2.75	0.88	2.38	0.88	74.90	84.67	89.00	1335.02	434.17	62.41	936.15
4426SO182M	19	996	2.61	0.44	1.30	0.55	51.76	94.03	81.27	1544.09	648.77	55.86	1061.35
4446EM100I	33	815	4.77	0.32	1.13	0.41	38.03	92.23	89.30	2947.05	462.63	50.08	1652.59
4453WM54I	24	275	4.09	0.55	1.74	0.70	36.50	52.10	85.34	2048.07	519.23	52.36	1256.61
4458SO182M	23	279	3.91	0.64	2.02	0.78	69.09	88.51	86.18	1982.24	534.39	55.25	1270.64
4459NO179M	37	333	6.20	0.74	2.68	0.88	71.05	80.46	88.22	3264.05	498.61	51.03	1888.14
4479CO192M	16	536	2.39	0.23	0.65	0.23	22.20	95.71	85.53	1368.45	605.08	62.64	1002.20
4481WM99I	30	762	4.37	0.54	1.83	0.71	41.48	58.61	80.54	2416.28	654.19	49.19	1475.76
4483NO158M	20	1302	2.65	0.45	1.34	0.66	54.26	81.87	73.00	1460.05	864.98	45.98	919.59
4490SO140M	21	278	3.55	0.78	2.37	0.88	58.85	66.56	78.77	1654.23	748.78	49.87	1047.27
4524CO162M	31	783	4.50	0.75	2.56	0.89	69.17	77.58	83.25	2580.61	632.76	49.46	1533.30
4529EM84I	31	6063	3.44	0.13	0.43	0.16	15.17	97.00	79.73	2471.59	706.76	48.48	1502.75
4545WO172I	35	1109	4.85	0.64	2.28	0.81	61.40	75.81	84.56	2959.52	603.65	47.26	1654.22
4559CO199M	37	5291	4.20	0.24	0.86	0.30	27.85	92.87	80.33	2972.14	695.34	45.93	1699.44
4561WM118I	26	1555	3.40	0.24	0.78	0.31	30.63	97.46	91.22	2371.72	345.95	62.02	1612.53
4563CO196M	31	2290	3.88	0.38	1.31	0.55	52.66	96.26	88.69	2749.25	467.48	54.48	1688.94
4574EO166I	28	514	4.33	0.53	1.78	0.68	47.90	70.93	88.89	2489.03	432.48	56.68	1587.07
4581WO171I	31	444	4.92	0.72	2.46	0.88	71.09	81.13	81.02	2511.61	616.71	47.31	1466.54
4613WM102I	36	1644	4.73	0.53	1.90	0.79	42.06	53.40	83.93	3021.32	620.08	46.73	1682.38
4633EM86I	28	949	3.94	0.59	1.96	0.75	53.80	71.56	77.41	2167.53	779.35	47.04	1317.08
4657EM84I	30	2380	3.73	0.20	0.68	0.27	26.23	98.07	87.34	2620.10	447.51	58.06	1741.73
4697WM62I	31	322	5.20	0.61	2.11	0.81	64.43	79.44	80.56	2497.47	668.10	50.36	1561.22
4913EM106I	44	548	6.82	0.64	2.41	0.83	71.34	86.46	89.82	3951.93	431.90	52.79	2322.70

S = number of species; N = abundance; d = Margalef's diversity; J' = Pielou's evenness; H'(log e) = Shannon-Weiner diversity index; 1-Lambda = Simpson's dominance, Delta = taxonomic diversity, Delta* = quantitative taxonomic

D12. (continued)

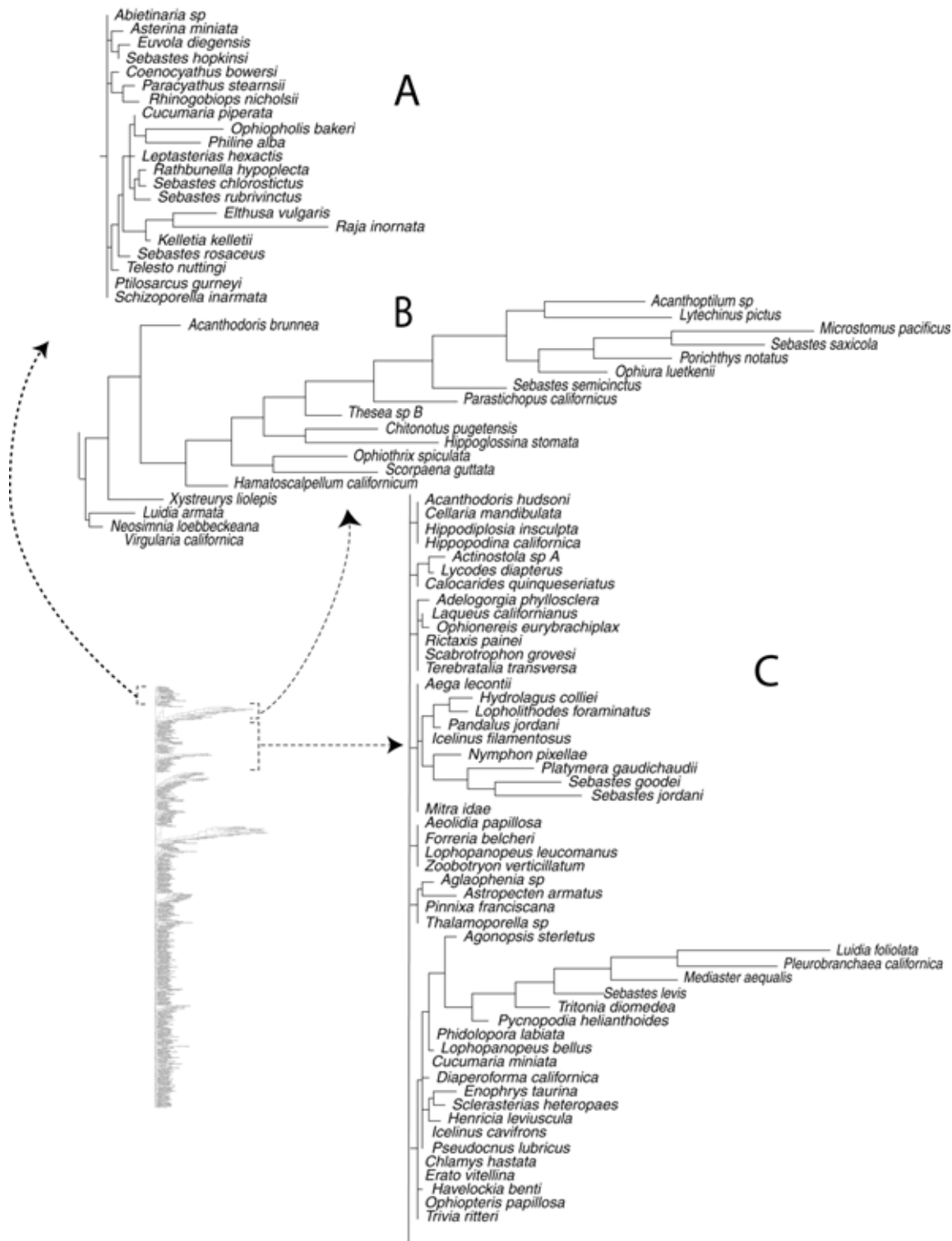
distinctness, Delta+ = average taxonomic distinctness, sDelta+ = total taxonomic distinctness, Lambda+ = variation in taxonomic distinctness, sPhi+ = phylogenetic diversity, Phi+ = average phylogenetic diversity.

Code = Station (xxxx), Region (a=letter), Shelfzone(a), depth(x-xxx), subshelf(a)

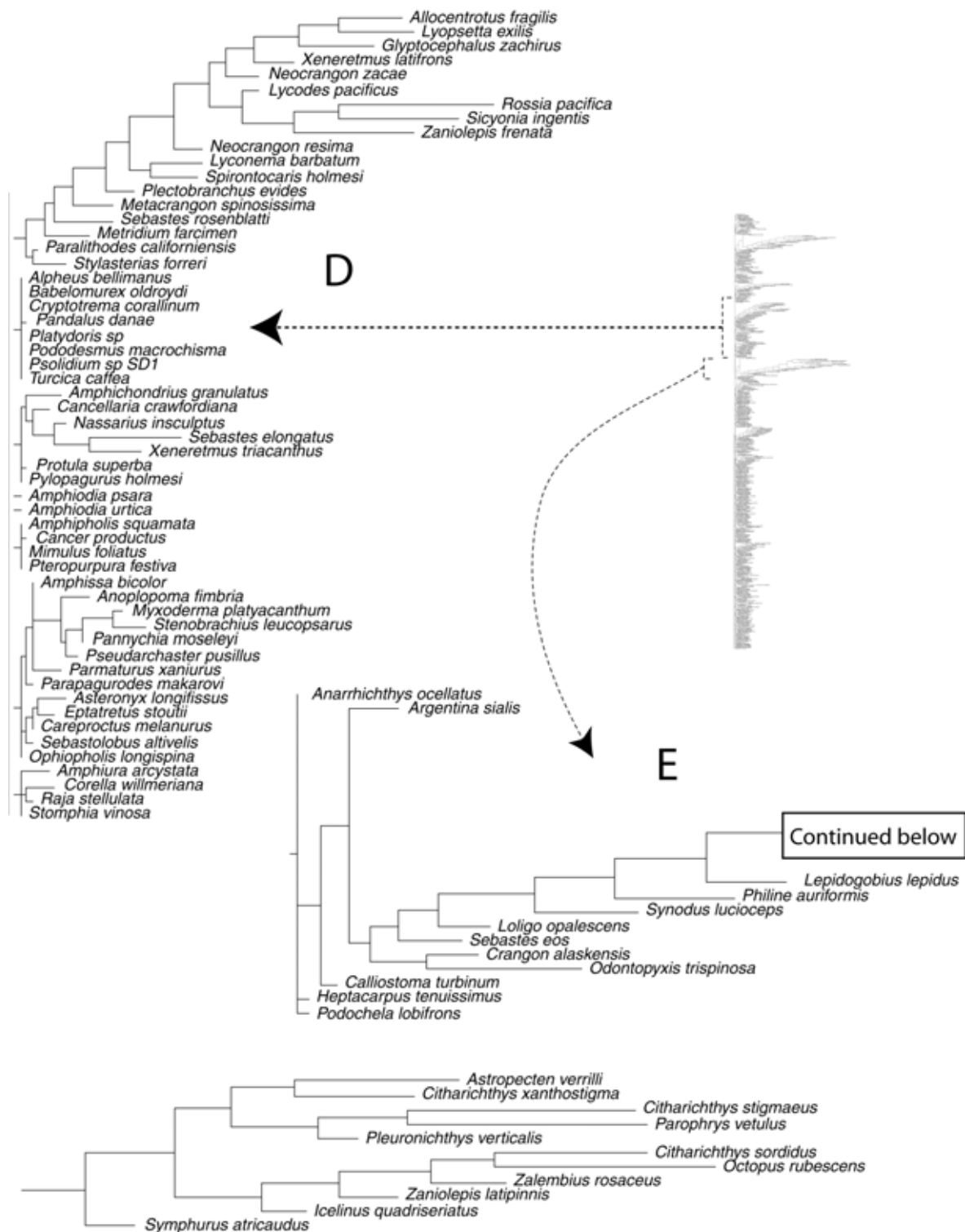
Region: C = Central, E = Warm (Southeast channel islands), N = Northern, S = Southern, W = Cool (Northwest channel islands)

Shelfzone: B = Bays and Harbors, I = Inner Shelf, M = Middle Shelf, O = Outer Shelf, U = Upper Slope

Subshelf: A = Marinas, I = Islands, L = Large POTWs, M = Mainland, N = Mainland non-POTW, P = Ports, S = Small POTWs



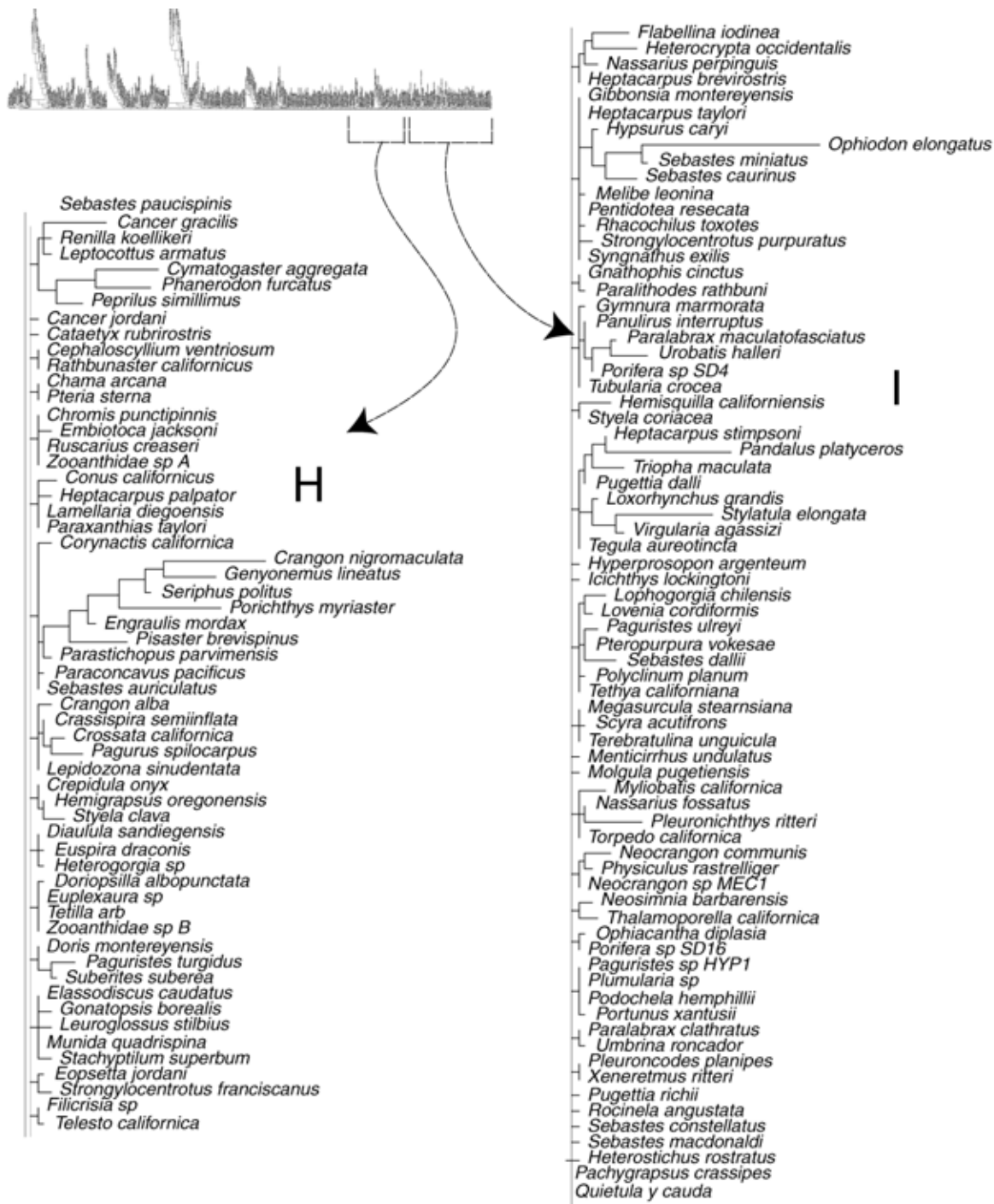
D13a. Parsimony analysis of co-occurring species (PACOS), or r-mode, cladogram showing the relationships of taxa based on their station occurrence on the southern California shelf and upper slope at depths of 2-476 m, July-October 2003. Large-scale clade sections, identified by letters, are matched to the central, small-scale, complete cladogram by dashed line arrows.



D13b.



D13c.



D13d.

D14. Biointegrity index values and response levels for Fish Foraging Guild Index (FFG), Fish Response Index (FRI), Trawl response Index (TRI), and Megabenthic Invertebrate Response Index (MIRI) at stations in the Southern California Bight 2003 Regional Survey, July-October 2003.

Station	Depth (m)	Response Index Value				Response Level ^a			
		FFG ^b	FRI ^c	TRI ^c	MIRI ^c	FFG ^b	FRI ^c	TRI ^c	MIRI ^c
4000	34	5.00	24.00	26.50	15.18	Reference	Reference	Reference	Reference
4003	16	-	71.79	62.67	48.92	Not Applicable ^d	Nonreference	Nonreference	Nonreference
4004	144	-	22.70	35.83	34.87	Not Applicable	Reference	Reference	Reference
4006	59	5.00	20.94	29.84	25.00	Reference	Reference	Reference	Reference
4007	452	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4012	72	5.00	13.42	30.31	32.39	Reference	Reference	Reference	Reference
4019	84	3.67	41.41	41.89	30.49	Reference	Reference	Reference	Reference
4021	37	5.00	25.63	34.74	32.74	Reference	Reference	Reference	Reference
4026	43	4.33	27.06	33.17	21.90	Reference	Reference	Reference	Reference
4027	100	3.67	19.93	38.73	30.61	Reference	Reference	Reference	Reference
4028	4	-	-	28.59	12.84	Not Applicable	No Value ^e	Reference	Reference
4029	81	3.67	22.54	15.92	10.95	Reference	Reference	Reference	Reference
4030	42	5.00	24.93	39.32	28.95	Reference	Reference	Reference	Reference
4035	71	4.33	28.83	45.17	42.94	Reference	Reference	Reference	Reference
4036	47	5.00	16.09	30.93	27.90	Reference	Reference	Reference	Reference
4037	60	5.00	18.11	33.33	33.36	Reference	Reference	Reference	Reference
4038	132	-	20.36	37.14	30.38	Not Applicable	Reference	Reference	Reference
4039	426	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4040	57	4.33	18.25	34.01	34.56	Reference	Reference	Reference	Reference
4041	81	4.33	21.93	31.18	26.16	Reference	Reference	Reference	Reference
4042	24	-	26.59	31.18	29.57	Not Applicable	Reference	Reference	Reference
4043	18	-	48.61	65.71	54.86	Not Applicable	Nonreference	Nonreference	Nonreference
4045	58	4.33	21.80	32.34	29.96	Reference	Reference	Reference	Reference
4047	25	-	72.90	55.57	26.16	Not Applicable	Nonreference	Nonreference	Reference
4048	72	3.67	16.27	23.51	20.94	Reference	Reference	Reference	Reference
4050	25	-	30.80	45.66	40.88	Not Applicable	Reference	Reference	Reference
4051	87	3.67	28.55	37.48	27.83	Reference	Reference	Reference	Reference
4055	18	-	58.60	50.55	25.05	Not Applicable	Nonreference	Reference	Reference
4057	138	-	34.45	39.37	31.83	Not Applicable	Reference	Reference	Reference
4058	28	-	27.16	31.29	24.26	Not Applicable	Reference	Reference	Reference
4061	14	-	45.24	51.73	45.00	Not Applicable	Reference	Nonreference	Reference
4062	23	-	30.72	40.33	49.09	Not Applicable	Reference	Reference	Nonreference
4064	26	-	20.46	24.56	18.33	Not Applicable	Reference	Reference	Reference
4065	6	-	43.13	41.40	13.25	Not Applicable	Reference	Reference	Reference
4068	184	-	26.61	34.51	27.20	Not Applicable	Reference	Reference	Reference
4070	72	4.33	22.02	34.52	30.39	Reference	Reference	Reference	Reference
4071	287	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4073	38	5.00	21.79	27.48	19.18	Reference	Reference	Reference	Reference
4077	56	3.67	22.19	33.84	29.40	Reference	Reference	Reference	Reference
4079	36	3.67	43.27	48.52	41.18	Reference	Reference	Reference	Reference
4080	63	4.33	21.75	36.55	32.83	Reference	Reference	Reference	Reference
4083	258	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4086	93	3.67	22.41	30.86	25.83	Reference	Reference	Reference	Reference
4088	469	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4090	28	-	27.21	34.84	35.31	Not Applicable	Reference	Reference	Reference
4091	428	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4092	4	-	10.60	31.74	14.53	Not Applicable	Reference	Reference	Reference
4094	20	-	38.98	36.72	18.96	Not Applicable	Reference	Reference	Reference
4096	80	3.67	12.03	17.24	16.12	Reference	Reference	Reference	Reference

D14. (continued)

Station	Depth	Response Index Value				Response Level ^a			
		FFG ^b	FRI ^c	TRI ^c	MIRI ^c	FFG ^b	FRI ^c	TRI ^c	MIRI ^c
4097	2	-	50.63	60.02	7.97	Not Applicable	Nonreference	Nonreference	Reference
4098	11	-	26.89	55.38	72.72	Not Applicable	Reference	Nonreference	Nonreference
4099	72	5.00	25.85	40.42	39.16	Reference	Reference	Reference	Reference
4101	38	5.00	20.85	30.51	28.68	Reference	Reference	Reference	Reference
4102	42	3.00	27.01	37.88	41.50	Nonreference	Reference	Reference	Reference
4109	44	5.00	17.86	29.96	27.40	Reference	Reference	Reference	Reference
4110	156	-	35.20	38.20	31.75	Not Applicable	Reference	Reference	Reference
4113	40	4.33	26.00	29.82	20.60	Reference	Reference	Reference	Reference
4115	86	3.00	24.94	28.87	21.22	Nonreference	Reference	Reference	Reference
4116	4	-	11.62	28.69	14.53	Not Applicable	Reference	Reference	Reference
4117	4	-	34.91	65.33	-	Not Applicable	Reference	Nonreference	No Value
4119	20	-	47.84	42.09	22.18	Not Applicable	Nonreference	Reference	Reference
4120	86	3.67	15.79	27.06	21.10	Reference	Reference	Reference	Reference
4122	47	3.67	27.86	31.60	25.43	Reference	Reference	Reference	Reference
4123	56	2.33	27.63	44.04	43.62	Nonreference	Reference	Reference	Reference
4125	394	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4128	22	-	20.32	39.25	37.21	Not Applicable	Reference	Reference	Reference
4129	4	-	50.63	51.71	15.54	Not Applicable	Nonreference	Nonreference	Reference
4131	6	-	84.61	93.76	27.38	Not Applicable	Nonreference	Nonreference	Reference
4132	377	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4133	197	-	40.53	47.60	41.56	Not Applicable	Reference	Reference	Reference
4134	76	3.67	26.16	37.94	29.79	Reference	Reference	Reference	Reference
4135	382	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4137	56	4.33	25.61	32.54	23.47	Reference	Reference	Reference	Reference
4138	10	-	23.03	43.17	40.55	Not Applicable	Reference	Reference	Reference
4141	56	4.33	30.02	36.10	29.69	Reference	Reference	Reference	Reference
4143	24	-	42.97	49.14	44.65	Not Applicable	Reference	Reference	Reference
4144	210	-	47.48	42.69	34.36	Not Applicable	Nonreference	Reference	Reference
4148	12	-	11.11	30.34	14.53	Not Applicable	Reference	Reference	Reference
4149	6	-	11.11	67.48	137.47	Not Applicable	Reference	Nonreference	Nonreference
4150	60	4.33	18.81	30.46	26.85	Reference	Reference	Reference	Reference
4152	90	3.67	16.83	30.17	32.31	Reference	Reference	Reference	Reference
4154	34	4.33	34.58	27.78	16.55	Reference	Reference	Reference	Reference
4155	100	4.33	17.40	33.50	25.26	Reference	Reference	Reference	Reference
4156	8	-	20.80	42.42	-	Not Applicable	Reference	Reference	No Value
4158	11	-	72.21	94.32	74.84	Not Applicable	Nonreference	Nonreference	Nonreference
4159	72	3.00	24.52	32.78	21.33	Nonreference	Reference	Reference	Reference
4162	15	-	28.75	36.88	17.47	Not Applicable	Reference	Reference	Reference
4163	130	-	8.50	27.21	22.42	Not Applicable	Reference	Reference	Reference
4164	101	3.00	14.37	33.91	25.10	Nonreference	Reference	Reference	Reference
4165	34	5.00	19.57	28.21	23.51	Reference	Reference	Reference	Reference
4166	68	3.67	33.21	46.95	53.39	Reference	Reference	Reference	Nonreference
4170	25	-	26.12	35.66	31.83	Not Applicable	Reference	Reference	Reference
4172	46	5.00	17.41	32.26	27.91	Reference	Reference	Reference	Reference
4173	104	3.67	-1.48	6.33	3.72	Reference	Reference	Reference	Reference
4177	5	-	11.11	50.12	42.18	Not Applicable	Reference	Reference	Reference
4179	364	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4180	2	-	13.75	33.25	-	Not Applicable	Reference	Reference	No Value
4181	12	-	36.38	52.66	77.18	Not Applicable	Reference	Nonreference	Nonreference
4183	34	3.67	36.77	42.82	36.73	Reference	Reference	Reference	Reference
4184	91	3.67	19.61	32.41	25.77	Reference	Reference	Reference	Reference
4187	202	-	47.40	40.74	36.16	Not Applicable	Nonreference	Reference	Reference
4189	18	-	74.41	68.53	98.80	Not Applicable	Nonreference	Nonreference	Nonreference
4193	5	-	21.05	40.16	38.41	Not Applicable	Reference	Reference	Reference

D14. (continued)

Station	Depth	Response Index Value				Response Level ^a			
		FFG ^b	FRI ^c	TRI ^c	MIRI ^c	FFG ^b	FRI ^c	TRI ^c	MIRI ^c
4199	456	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4200	58	4.33	14.34	32.11	34.45	Reference	Reference	Reference	Reference
4201	341	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4202	264	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4203	24	-	40.61	49.79	59.01	Not Applicable	Reference	Reference	Nonreference
4204	7	-	90.73	75.84	28.41	Not Applicable	Nonreference	Nonreference	Reference
4205	66	4.33	20.27	29.27	26.30	Reference	Reference	Reference	Reference
4207	24	-	62.24	44.66	24.22	Not Applicable	Nonreference	Reference	Reference
4208	8	-	47.01	67.99	74.41	Not Applicable	Nonreference	Nonreference	Nonreference
4210	18	-	23.74	51.86	57.22	Not Applicable	Reference	Nonreference	Nonreference
4211	388	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4212	3	-	11.11	31.52	-	Not Applicable	Reference	Reference	Not Applicable
4215	22	-	52.43	48.26	40.43	Not Applicable	Nonreference	Reference	Reference
4222	40	5.00	21.17	30.53	28.93	Reference	Reference	Reference	Reference
4227	136	-	-1.92	31.55	25.34	Not Applicable	Reference	Reference	Reference
4230	54	5.00	20.24	30.89	24.77	Reference	Reference	Reference	Reference
4232	76	3.67	17.48	30.62	28.21	Reference	Reference	Reference	Reference
4235	54	4.33	29.13	22.93	14.48	Reference	Reference	Reference	Reference
4237	225	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4238	22	-	22.47	41.63	53.14	Not Applicable	Reference	Reference	Nonreference
4239	322	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4240	248	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4241	32	5.00	22.82	29.63	23.89	Reference	Reference	Reference	Reference
4243	86	3.67	37.94	32.29	20.38	Reference	Reference	Reference	Reference
4244	58	4.33	14.88	33.26	32.74	Reference	Reference	Reference	Reference
4248	59	4.33	15.68	33.18	33.60	Reference	Reference	Reference	Reference
4253	16	-	84.31	85.24	65.55	Not Applicable	Nonreference	Nonreference	Nonreference
4254	454	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4255	202	-	43.16	44.61	40.31	Not Applicable	Reference	Reference	Reference
4256	38	5.00	24.05	32.31	23.61	Reference	Reference	Reference	Reference
4259	12	-	18.23	49.09	39.45	Not Applicable	Reference	Reference	Reference
4260	124	-	8.59	23.77	19.89	Not Applicable	Reference	Reference	Reference
4261	319	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4263	476	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4265	38	5.00	23.34	28.77	22.78	Reference	Reference	Reference	Reference
4267	30	-	33.02	45.63	62.64	Not Applicable	Reference	Reference	Nonreference
4269	155	-	44.62	49.69	46.51	Not Applicable	Reference	Reference	Nonreference
4277	52	5.00	23.23	34.70	26.51	Reference	Reference	Reference	Reference
4279	204	-	42.08	45.32	34.06	Not Applicable	Reference	Reference	Reference
4280	41	5.00	19.11	28.40	26.90	Reference	Reference	Reference	Reference
4285	198	-	11.50	40.78	44.33	Not Applicable	Reference	Reference	Reference
4286	40	5.00	22.15	27.39	22.37	Reference	Reference	Reference	Reference
4290	24	-	24.78	47.00	59.70	Not Applicable	Reference	Reference	Nonreference
4291	29	-	44.40	49.33	70.33	Not Applicable	Reference	Reference	Nonreference
4294	28	-	36.98	39.52	23.48	Not Applicable	Reference	Reference	Reference
4295	402	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4296	49	3.67	17.92	33.89	35.70	Reference	Reference	Reference	Reference
4300	14	-	31.95	50.03	56.61	Not Applicable	Reference	Reference	Nonreference
4309	14	-	23.84	43.67	41.28	Not Applicable	Reference	Reference	Reference
4312	120	3.67	8.59	36.63	35.89	Reference	Reference	Reference	Reference
4315	20	-	40.01	46.61	57.34	Not Applicable	Reference	Reference	Nonreference
4317	28	-	37.08	42.64	54.99	Not Applicable	Reference	Reference	Nonreference
4320	20	-	16.37	36.95	39.24	Not Applicable	Reference	Reference	Reference
4323	152	-	-6.33	35.56	22.27	Not Applicable	Reference	Reference	Reference

D14. (continued)

Station	Depth	Response Index Value				Response Level ^a			
		FFG ^b	FRI ^c	TRI ^c	MIRI ^c	FFG ^b	FRI ^c	TRI ^c	MIRI ^c
4326	41	3.67	23.08	27.65	20.62	Reference	Reference	Reference	Reference
4327	433	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4328	30	-	21.94	34.96	37.88	Not Applicable	Reference	Reference	Reference
4329	228	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4331	21	-	30.94	54.82	51.60	Not Applicable	Reference	Nonreference	Nonreference
4336	24	-	21.59	33.80	25.15	Not Applicable	Reference	Reference	Reference
4339	64	4.33	34.74	39.31	21.39	Reference	Reference	Reference	Reference
4343	192	-	47.51	39.25	33.14	Not Applicable	Nonreference	Reference	Reference
4347	110	3.00	17.93	31.07	23.30	Nonreference	Reference	Reference	Reference
4349	28	-	47.56	46.01	39.68	Not Applicable	Nonreference	Reference	Reference
4350	36	3.67	26.46	32.17	28.47	Reference	Reference	Reference	Reference
4351	52	4.33	40.55	42.01	24.79	Reference	Reference	Reference	Reference
4356	463	-	-	-	-	Not Applicable	Not Applicable	Not Applicable	Not Applicable
4365	48	5.00	23.50	32.14	21.23	Reference	Reference	Reference	Reference
4366	28	-	18.21	34.51	31.05	Not Applicable	Reference	Reference	Reference
4367	16	-	33.29	40.13	55.45	Not Applicable	Reference	Reference	Nonreference
4369	56	4.33	24.54	33.31	24.84	Reference	Reference	Reference	Reference
4371	80	3.00	30.25	35.80	25.91	Nonreference	Reference	Reference	Reference
4374	12	-	20.10	38.07	39.89	Not Applicable	Reference	Reference	Reference
4376	92	2.33	21.86	32.87	29.18	Nonreference	Reference	Reference	Reference
4381	12	-	64.44	61.28	49.92	Not Applicable	Nonreference	Nonreference	Nonreference
4384	41	5.00	19.75	32.62	29.71	Reference	Reference	Reference	Reference
4400	17	-	29.29	49.65	48.00	Not Applicable	Reference	Reference	Nonreference
4402	14	-	42.44	64.32	63.09	Not Applicable	Reference	Nonreference	Nonreference
4404	5	-	19.31	42.44	27.38	Not Applicable	Reference	Reference	Reference
4408	11	-	23.00	62.79	82.18	Not Applicable	Reference	Nonreference	Nonreference
4417	45	3.00	39.22	36.48	22.98	Nonreference	Reference	Reference	Reference
4418	5	-	11.62	28.52	-	Not Applicable	Reference	Reference	No Value
4419	128	-	10.03	31.68	-	Not Applicable	Reference	Reference	No Value
4421	95	2.33	27.04	31.49	27.80	Nonreference	Reference	Reference	Reference
4423	4	-	11.11	30.91	14.15	Not Applicable	Reference	Reference	Reference
4426	182	-	28.99	38.89	28.15	Not Applicable	Reference	Reference	Reference
4446	100	5.00	0.84	21.71	16.48	Reference	Reference	Reference	Reference
4453	54	4.33	26.73	29.34	18.98	Reference	Reference	Reference	Reference
4458	182	-	23.75	32.88	29.08	Not Applicable	Reference	Reference	Reference
4459	179	-	20.50	23.19	13.47	Not Applicable	Reference	Reference	Reference
4479	192	-	33.18	23.61	16.43	Not Applicable	Reference	Reference	Reference
4481	99	3.67	30.88	41.12	31.91	Reference	Reference	Reference	Reference
4483	158	-	-1.58	41.24	40.70	Not Applicable	Reference	Reference	Reference
4490	140	-	39.51	42.79	34.42	Not Applicable	Reference	Reference	Reference
4524	162	-	27.67	42.05	41.59	Not Applicable	Reference	Reference	Reference
4529	84	3.67	37.05	33.47	17.79	Reference	Reference	Reference	Reference
4545	172	-	33.51	40.32	39.30	Not Applicable	Reference	Reference	Reference
4559	199	-	34.62	43.57	32.47	Not Applicable	Reference	Reference	Reference
4561	118	3.00	9.17	18.27	13.92	Nonreference	Reference	Reference	Reference
4563	196	-	36.59	39.75	37.67	Not Applicable	Reference	Reference	Reference
4574	166	-	9.67	31.83	19.96	Not Applicable	Reference	Reference	Reference
4581	171	-	23.21	41.95	37.66	Not Applicable	Reference	Reference	Reference
4613	102	2.33	31.28	40.34	22.19	Nonreference	Reference	Reference	Reference
4633	86	3.67	39.02	44.44	33.87	Reference	Reference	Reference	Reference
4657	84	3.00	33.31	31.54	20.61	Nonreference	Reference	Reference	Reference
4697	62	5.00	26.25	36.10	24.99	Reference	Reference	Reference	Reference
4913	106	3.00	13.47	20.88	16.03	Nonreference	Reference	Reference	Reference

D14. (continued)

All Indices are from Allen et al. 2001a.

^aBiointegrity index response levels were assigned according to the following threshold values: FFG ? 3.67 (Reference), ? 1.83 (Impact); FRI ? 45 (Reference); TRI ? 51 (Reference); IRI ? 46 (Reference).

^bFFG corresponds to the response index for pelagivores (Guild 2A), pelagobenthivores (Guild 2B), and extracting benthivores (Guild 2D1a) of the middle shelf only. See Figure 75 for representative guild species of the middle shelf from the Bight '98 regional trawl survey.

^cThe FRI, TRI, and MIRI indice depth range only extends to 215 m.

^dNot Applicable = depth is out of range for this biointegrity index.

^eNo Value = no p values were determined for the species present at this station, hence no Index value could be determined.