

CARLSBAD SEAWATER DESALINATION PROJECT

SAN DIEGO REGIONAL WATER QUALITY CONTROL BOARD

REGION 9, SAN DIEGO REGION

ORDER NO. R-9-2006-0065

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FLOW, ENTRAINMENT AND IMPINGEMENT MINIMIZATION PLAN

**ATTACHMENT 6 - CARLSBAD DESALINATION FACILITY – ENCINA
POWER STATION, SUMMARY OF FISH AND TARGET SHELLFISH LARVAE
COLLECTED FOR ENTRAINMENT AND SOURCE WATER STUDIES IN THE
VICINITY OF AGUA HEDIONDA LAGOON FROM JUNE 2004 THROUGH
MAY 2005.**

March 27, 2009

Carlsbad Desalination Facility Encina Power Station

Summary of Fish and Target Shellfish Larvae
Collected for Entrainment and Source Water Studies
in the Vicinity of Agua Hedionda Lagoon
from June 2004 through May 2005

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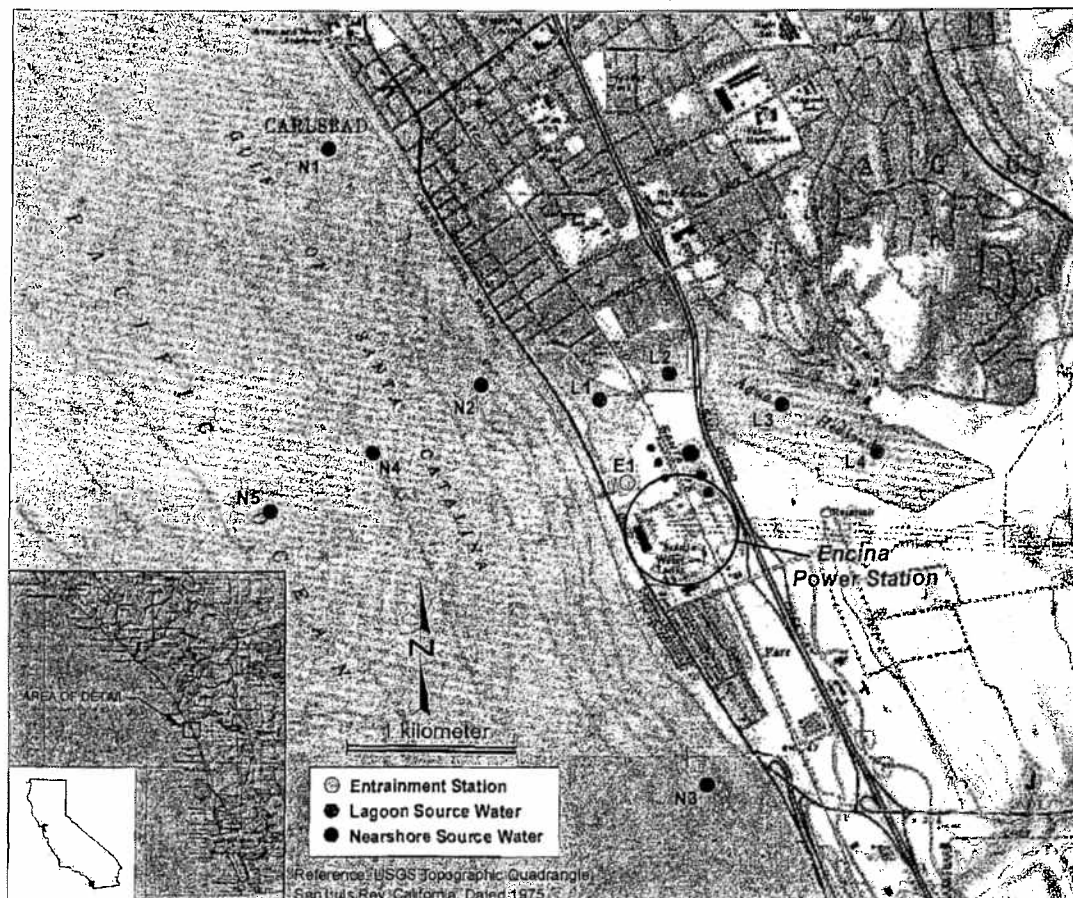


Figure 1. Location of entrainment (E1) and source water (L1–L4; N1–N5) plankton sampling stations.

Entrainment and Source Water Summary

Table 1. Average concentration and total number collected of larval fishes and target shellfishes in entrainment samples collected in Agua Hedionda Lagoon (Station E1), June 2004–May 2005.

Taxon	Common Name	Average Concentration (# / 1,000 m ³)	Total Count	Percentage of Total	Cumulative Percentage
Gobiidae (CIQ complex)	gobies	2,222.93	12,763	61.95	61.95
<i>Hypsoblennius</i> spp.	blennies	1,107.67	5,838	28.34	90.29
Engraulidae	anchovies	134.29	819	3.98	94.27
<i>Hypsypops rubicundus</i>	garibaldi	40.99	188	0.91	95.18
<i>Typhlogobius californiensis</i>	blind goby	24.65	148	0.72	95.90
<i>Gibbonsia</i> spp.	clinid kelpfishes	22.45	125	0.61	96.51
Labrisomidae.	labrisomid kelpfishes	17.65	81	0.39	96.90
Syngnathidae	pipefishes	16.06	83	0.40	97.30
<i>Acanthogobius flavimanus</i>	yellowfin goby	14.41	87	0.42	97.72
larvae, unid. fish fragment	unid. larval fishes	9.65	56	0.27	98.00
Atherinopsidae	silversides	9.18	54	0.26	98.26
larvae, unid. yolksac	unid. yolksac larvae	8.36	39	0.19	98.45
<i>Roncador stearnsii</i>	spotfin croaker	8.33	42	0.20	98.65
<i>Rimicola</i> spp.	kelp clingfishes	7.92	43	0.21	98.86
<i>Genyonemus lineatus</i>	white croaker	7.04	44	0.21	99.07
<i>Seriphus politus</i>	queenfish	5.50	29	0.14	99.21
<i>Paraclinus integripinnis</i>	reef finspot	4.95	31	0.15	99.36
<i>Paralichthys californicus</i>	California halibut	3.73	21	0.10	99.47
<i>Sardinops sagax</i>	Pacific sardine	2.66	16	0.08	99.54
<i>Citharichthys</i> spp.	sanddabs	2.24	14	0.07	99.61
<i>Gillichthys mirabilis</i>	longjaw mudsucker	2.14	13	0.06	99.67
Sciaenidae	croakers	1.86	11	0.05	99.73
<i>Paralabrax</i> spp.	sea basses	1.86	11	0.05	99.78
<i>Hypsopsetta guttulata</i>	diamond turbot	1.78	10	0.05	99.83
larvae, unid. post-yolksac	larval fishes	1.61	10	0.05	99.88
Pleuronectiformes	flatfishes	0.63	4	0.02	99.90
<i>Heterostichus rostratus</i>	giant kelpfish	0.54	3	0.01	99.91
<i>Clinocottus analis</i>	wooly sculpin	0.51	3	0.01	99.93
<i>Stenobranchius leucopsarus</i>	northern lampfish	0.37	2	0.01	99.94
<i>Cheilotrema saturnum</i>	black croaker	0.35	2	0.01	99.95
<i>Scomber japonicus</i>	Pacific mackerel	0.35	1	<0.01	99.95
Ophidiidae	cusk-eels	0.21	1	<0.01	99.96
Gobiesocidae	clingfishes	0.20	1	<0.01	99.96
<i>Diaphus theta</i>	Calif. headlight fish	0.19	1	<0.01	99.96
<i>Semicossyphus pulcher</i>	California sheephead	0.19	1	<0.01	99.97
<i>Menticirrhus undulatus</i>	California corbina	0.18	1	<0.01	99.97
Haemulidae	grunts	0.18	1	<0.01	99.98
Labridae	wrasses	0.17	1	<0.01	99.98
Myctophidae	lanternfishes	0.16	1	<0.01	99.99
<i>Symbolophorus californiensis</i>	California lanternfish	0.16	1	<0.01	99.99
<i>Oxyjulis californica</i>	señorita	0.14	1	<0.01	100.00
			20,601		
<i>Cancer</i> spp. (megalops)	cancer crabs	0.17	1		0.07

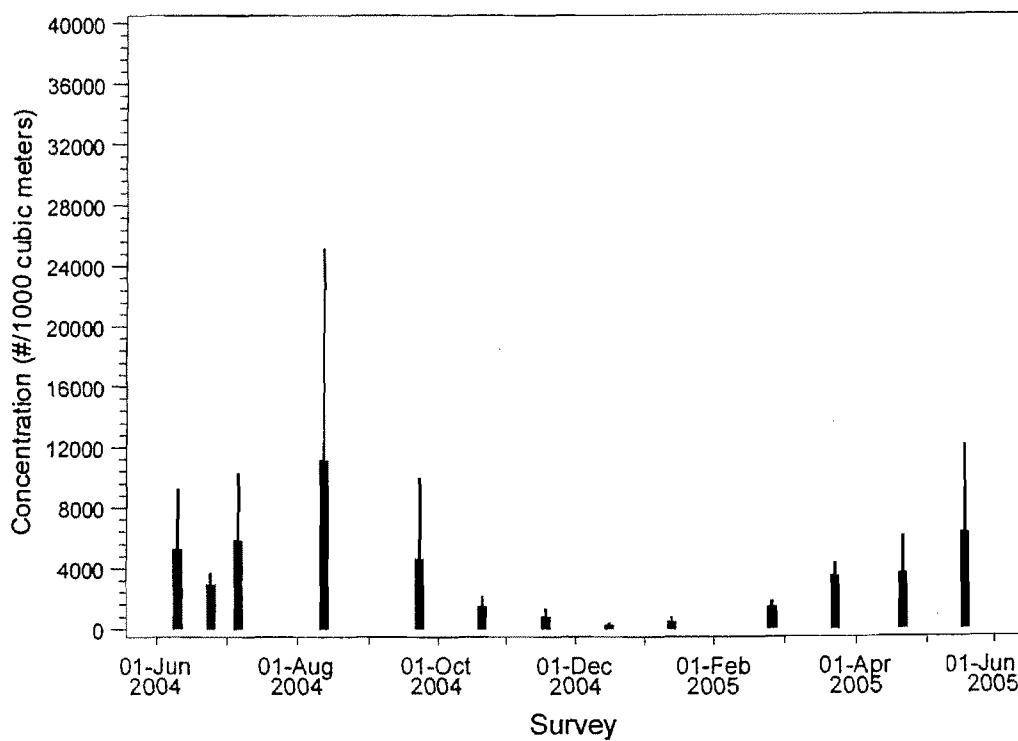


Figure 2. Mean concentration (# / 1,000 m³ [264,172 gal]) and standard error of all larval fishes collected at entrainment Station E1 during monthly surveys, June 2004–May 2005.

Entrainment and Source Water Summary

Table 2. Average concentration of larval fishes and target shellfishes in source water samples collected at Agua Hedionda Lagoon and nearshore stations, June 2004–May 2005.

Taxon	Common Name	Nearshore		Lagoon	
		Average Concentration (# / 1,000 m ³)	Total Count	Average Concentration (# / 1,000 m ³)	Total Count
Fishes					
<i>Engraulidae</i>	anchovies	525.48	7,631	103.41	1,210
<i>Hypsoblennius</i> spp.	blennies	137.56	1,966	467.32	4,725
Gobiidae (CIQ complex)	gobies	69.12	921	2,718.58	30,270
<i>Genyonemus lineatus</i>	white croaker	64.66	921	4.25	54
larvae, unidentified yolksac	unid. yolksac larvae	45.82	678	3.12	32
<i>Paralichthys californicus</i>	California halibut	42.91	601	1.93	22
<i>Paralabrax</i> spp.	sand basses	24.88	372	0.68	8
<i>Seriphys politus</i>	queenfish	23.79	365	2.40	26
Sciaenidae	croaker	22.55	306	6.56	73
<i>Citharichthys</i> spp.	sanddabs	21.70	334	1.14	15
<i>Roncador stearnsii</i>	spotfin croaker	20.17	286	6.82	74
<i>Gibbonsia</i> spp.	clinid kelpfishes	19.29	277	16.74	182
Labrisomidae	labrisomid kelpfishes	16.36	219	35.30	366
<i>Sardinops sagax</i>	Pacific sardine	13.21	202	0.74	9
larval fish fragment	unid. larval fishes	10.50	145	15.02	174
Haemulidae	grunts	8.80	116	0.17	2
<i>Scomber japonicus</i>	Pacific mackerel	7.07	110	-	-
<i>Hypsypops rubicundus</i>	garibaldi	7.03	110	35.12	352
larval/post-larval fish unid.	larval fishes	6.81	93	1.36	16
<i>Oxyjulis californica</i>	senorita	5.55	79	0.75	8
<i>Paralabrax nebulifer</i>	barred sand bass	5.08	82	-	-
<i>Sphyaena argentea</i>	California barracuda	3.74	59	0.17	2
<i>Xenistius californiensis</i>	salema	3.61	55	0.30	3
<i>Lepidogobius lepidus</i>	bay goby	3.59	56	0.09	1
<i>Stenobranchius leucopsarus</i>	northern lampfish	3.26	51	-	-
Atherinopsidae	silversides	3.09	39	29.73	348
<i>Pleuronichthys verticalis</i>	hornyhead turbot	2.79	43	-	-
<i>Umbrina roncador</i>	yellowfin croaker	2.62	39	0.09	1
Ophidiidae	cusks-eels	2.61	37	0.09	1
<i>Pleuronichthys ritteri</i>	spotted turbot	2.51	34	0.17	2
Pleuronectidae unid.	flounders	2.28	35	0.08	1
<i>Xystreureys liolepis</i>	fantail sole	1.97	27	0.21	2
<i>Hypsopsetta guttulata</i>	diamond turbot	1.97	30	0.55	7
<i>Rimicola</i> spp.	kelp clingfishes	1.79	22	3.28	34
<i>Peprilus simillimus</i>	Pacific butterfish	1.78	28	-	-
<i>Cheilotrema saturnum</i>	black croaker	1.71	24	0.36	4
<i>Semicossyphus pulcher</i>	California sheephead	1.49	21	-	-
<i>Diaphus theta</i>	Calif. headlight fish	1.46	24	-	-
<i>Acanthogobius flavimanus</i>	yellowfin goby	1.46	22	38.98	499
Pleuronectiformes	flatfishes	1.25	21	0.07	1
<i>Menticirrhus undulatus</i>	California corbina	1.21	16	0.47	5
<i>Atractoscion nobilis</i>	white seabass	1.18	18	0.08	1
<i>Sebastes</i> spp.	rockfishes	1.09	18	-	-

(table continued)

Entrainment and Source Water Summary

Table 2 (continued). Average concentration of larval fishes and target shellfishes in source water samples collected at nearshore stations and Agua Hedionda Lagoon, June 2004-May 2005.

Taxon	Common Name	Nearshore		Lagoon	
		Average Concentration (# / 1,000 m ³)	Total Count	Average Concentration (# / 1,000 m ³)	Total Count
<i>Girella nigricans</i>	opaleye	1.06	16	-	-
Syngnathidae	pipefishes	1.02	13	5.31	53
<i>Typhlogobius californiensis</i>	blind goby	0.99	15	9.63	118
<i>Trachurus symmetricus</i>	jack mackerel	0.96	17	-	-
<i>Halichoeres semicinctus</i>	rock wrasse	0.95	15	-	-
Labridae	wrasses	0.83	11	-	-
<i>Paraclinus integripinnis</i>	reef finspot	0.81	14	2.88	31
<i>Symphurus atricaudus</i>	California tonguefish	0.77	11	-	-
<i>Triphoturus mexicanus</i>	Mexican lampfish	0.73	12	0.16	2
<i>Nannobranchium</i> spp.	lanternfishes	0.57	9	-	-
<i>Medialuna californiensis</i>	halfmoon	0.53	7	-	-
<i>Gillichthys mirabilis</i>	longjaw mudsucker	0.51	8	5.17	62
<i>Chilara taylora</i>	spotted cusk-eel	0.50	7	-	-
<i>Heterostichus rostratus</i>	giant kelpfish	0.50	7	-	-
Paralichthyidae	lefteye flounders	0.44	7	-	-
<i>Parophrys vetulus</i>	English sole	0.30	5	-	-
Myctophidae	lanternfishes	0.30	4	-	-
<i>Hippoglossina stomata</i>	bigmouth sole	0.29	5	-	-
<i>Zaniolepis frenata</i>	shortspine combfish	0.25	5	-	-
<i>Ruscarius creaseri</i>	roughcheek sculpin	0.22	3	-	-
Clupeiformes	herrings and anchovies	0.21	3	-	-
Gobiesocidae	clingfishes	0.18	3	0.64	7
Clupeidae	herrings	0.18	3	-	-
<i>Lyopsetta exilis</i>	slender sole	0.16	3	-	-
Pomacentridae	damsel fishes	0.14	2	-	-
<i>Rhinogobiops nicholsii</i>	blackeye goby	0.14	2	-	-
<i>Nannobranchium ritteri</i>	broadfin lampfish	0.13	2	-	-
<i>Cyclothone</i> spp.	bristlemouths	0.13	2	-	-
<i>Chromis punctipinnis</i>	blacksmith	0.13	2	-	-
<i>Icelinus</i> spp.	sculpins	0.13	3	-	-
<i>Anisotremus davidsonii</i>	sargo	0.12	2	-	-
<i>Sebastes jordani</i>	shortbelly rockfish	0.10	2	-	-
Blennioidei	blennies	0.08	1	0.36	4
Clinidae	clinid kelpfishes	0.08	1	-	-
Chaenopsidae	tube blennies	0.07	1	-	-
<i>Leptocottus armatus</i>	Pacific staghorn sculpin	0.07	1	0.51	6
Cynoglossidae	tongue soles	0.07	1	-	-
Kyphosidae	sea chubs	0.07	1	-	-
<i>Cyclothone acclindens</i>	benttooth bristlemouth	0.07	1	-	-
Hexagrammidae	greenlings	0.06	1	-	-
<i>Bathylagus ochotensis</i>	popeye blacksmelt	0.06	1	-	-
<i>Hypsoblennius gentilis</i>	bay blenny	0.05	1	-	-
<i>Rimicola eigenmanni</i>	slender clingfish	-	-	4.13	53
<i>Clinocottus analis</i>	wooly sculpin	-	-	0.31	4
<i>Clinocottus</i> spp.	sculpins	-	-	0.07	1
<i>Semicossyphus pulcher</i>	California sheephead	-	-	0.06	1
			16,763		38,872
Shellfishes					
<i>Cancer</i> spp. (megalops)	cancer crabs	9.29	158	0.17	2
<i>Panulirus interruptus</i> (larval)	California spiny lobster	7.04	98	0.21	2
<i>Cancer gracilis</i> (megalops)	slender crab	2.93	48		

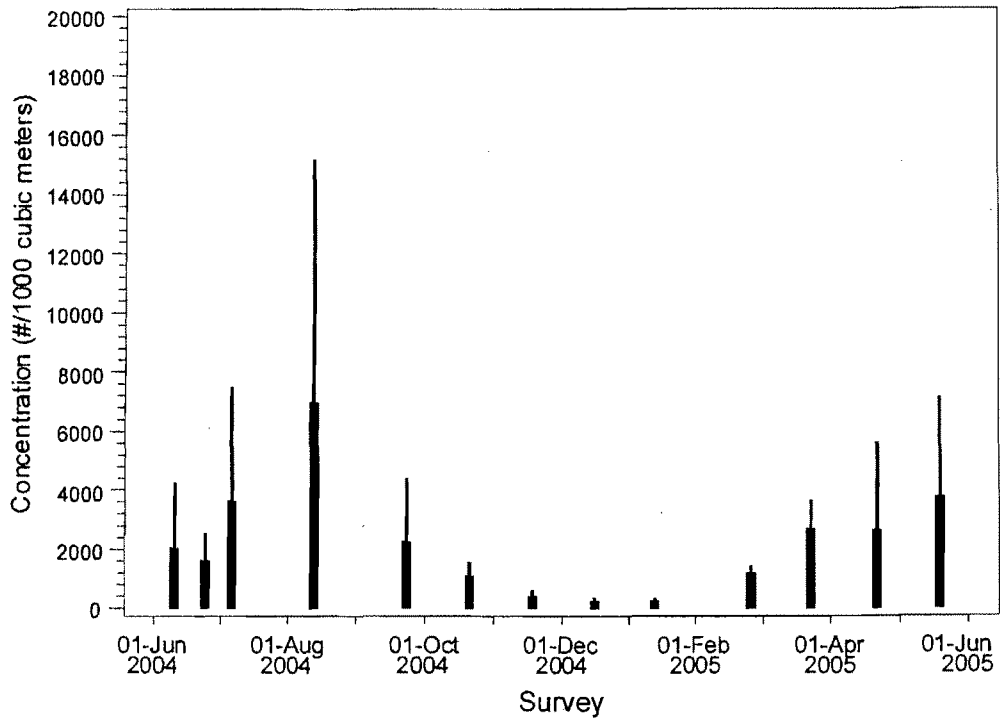


Figure 3. Comparison among surveys of mean concentration (#/1,000 m³ [264,172 gal]) of CIQ goby complex larvae at entrainment Station E1.

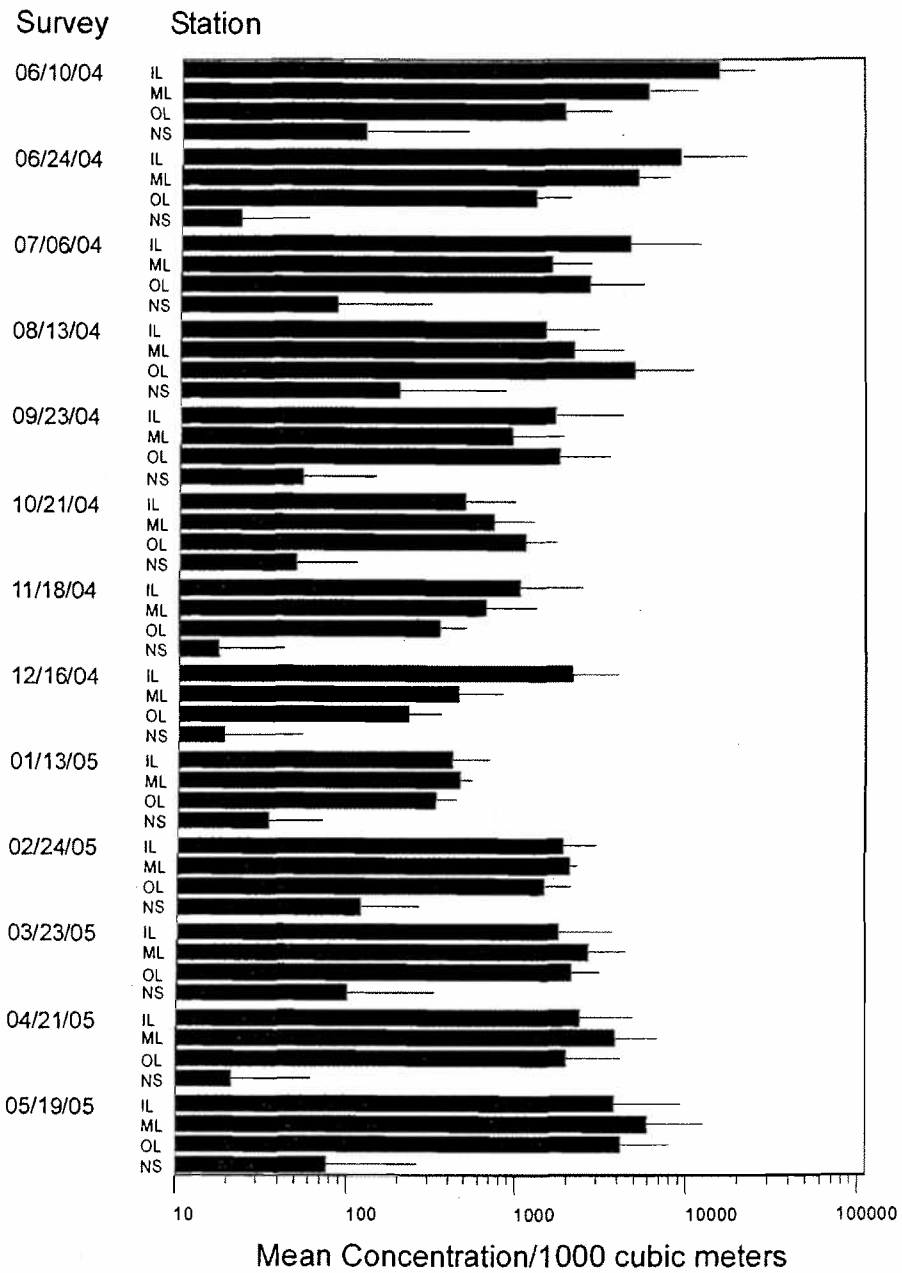


Figure 4. Mean concentration (#/1,000 m³ [264,172 gal]) and standard error of CIQ goby complex larvae at Agua Hedionda Lagoon (inner, middle, and outer) and nearshore source water stations during the 2004 and 2005 sampling periods. Note logarithmic abundance scale.

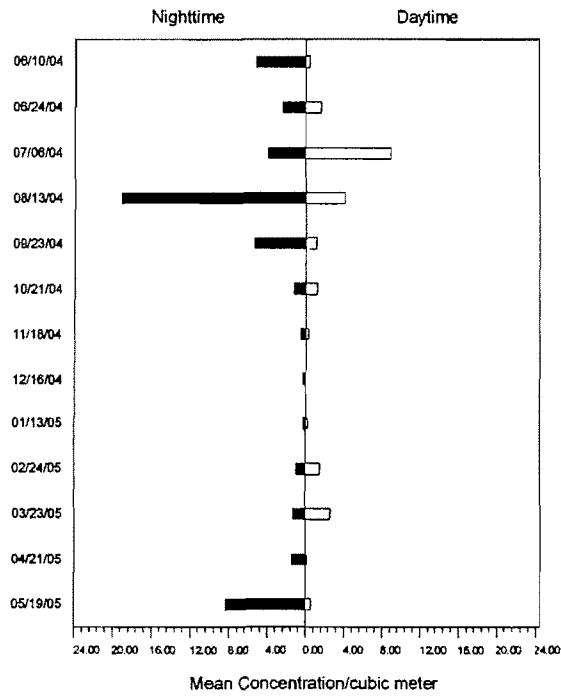


Figure 5. Mean concentration (#/1.0 m³ [264 gal]) of CIQ goby complex larvae at entrainment Station E1 during night (Cycle 3) and day (Cycle 1) sampling.

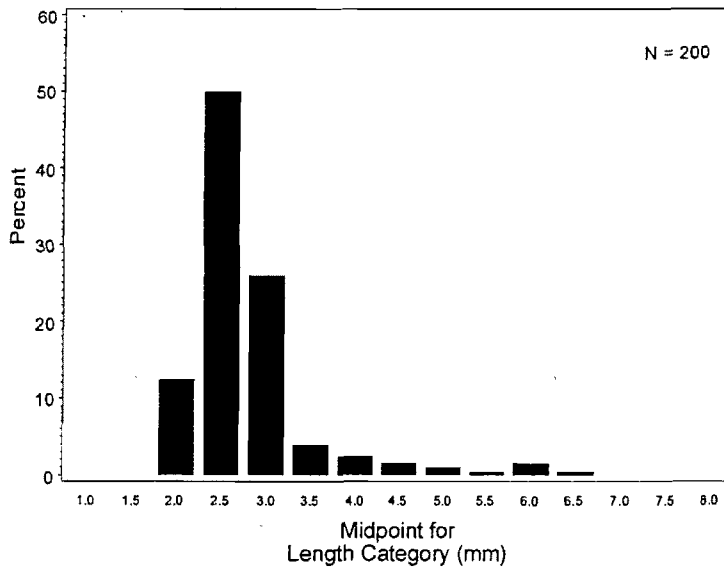


Figure 6. Length frequency of CIQ goby complex larvae at entrainment Station E1. Data from sub-samples of all surveys in 2004–2005.

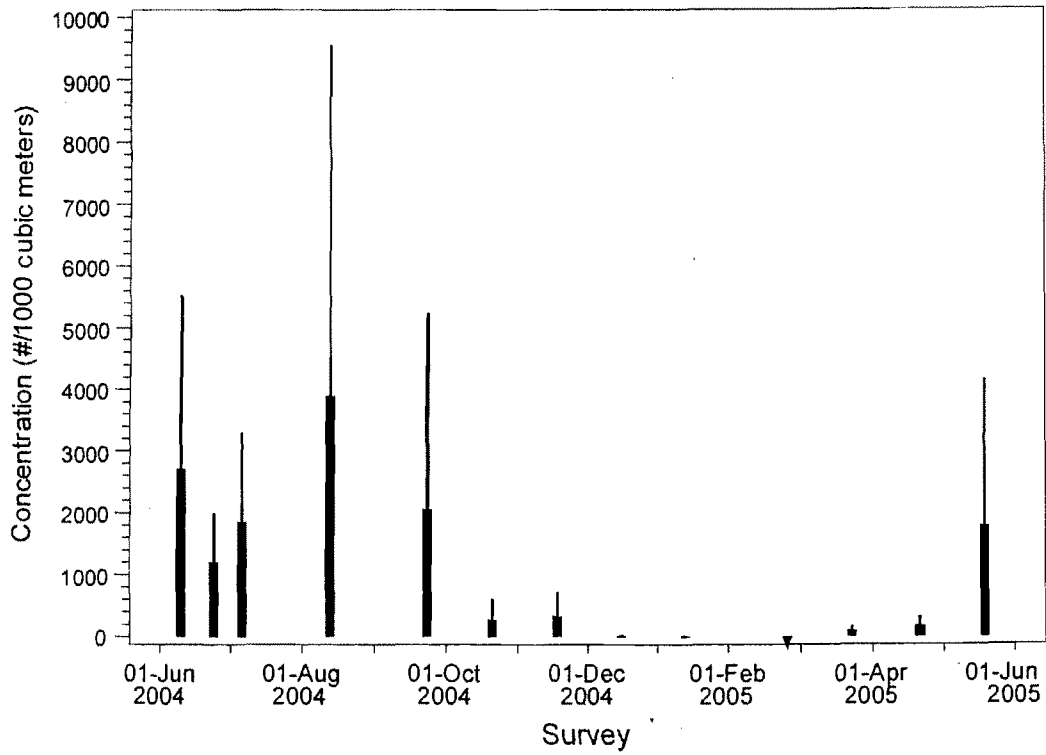


Figure 7. Comparison among surveys of mean concentration (#/1000 m³ [264,172 gal]) of combtooth blenny larvae at entrainment Station E1. Note: downward pointing triangle indicates survey with no larvae collected.

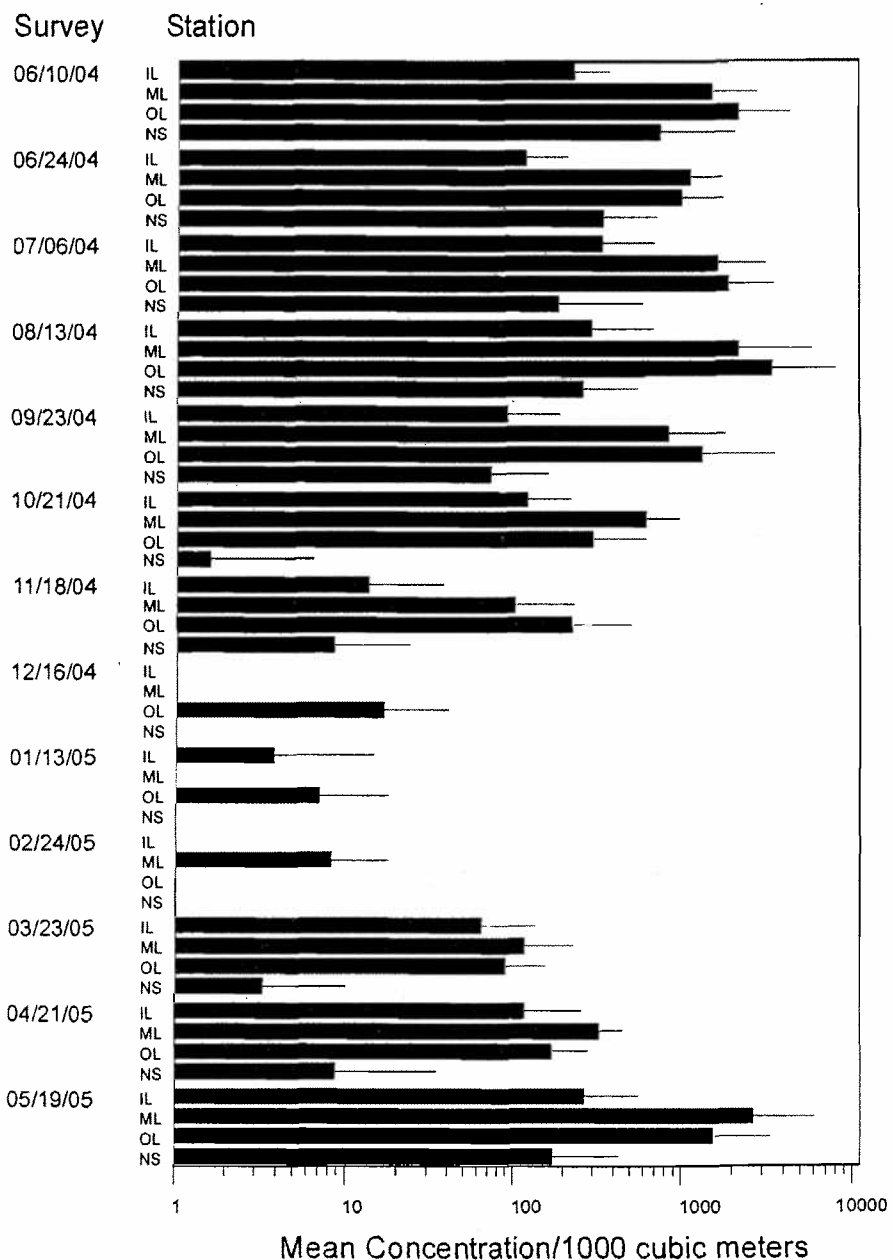


Figure 8. Mean concentration (#/1000 m³ [264,172 gal]) and standard error of combtooth blenny larvae at Agua Hedionda Lagoon (inner, middle, and outer) and nearshore source water stations during the 2004 and 2005 sampling periods. Note logarithmic scale for mean concentration.

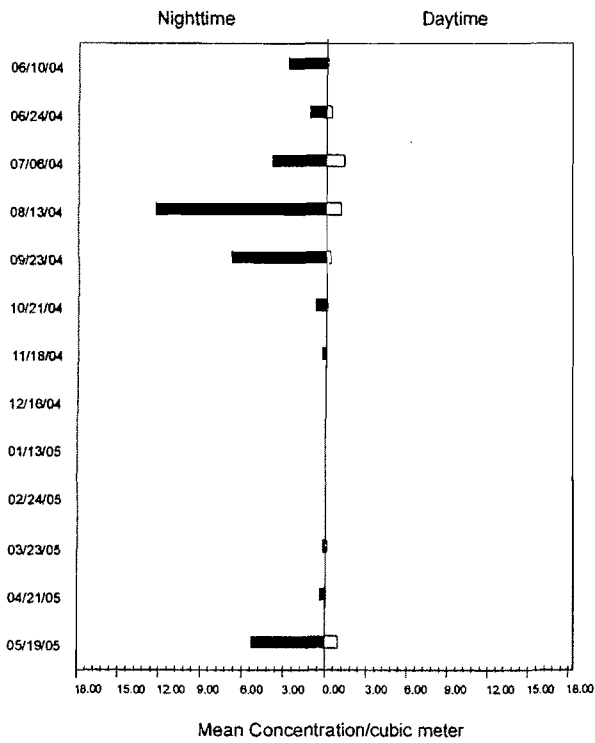


Figure 9. Mean concentration (#/1.0 m³ [264 gal]) of combtooth blenny larvae at entrapment Station E1 during night (Cycle 3) and day (Cycle 1) sampling.

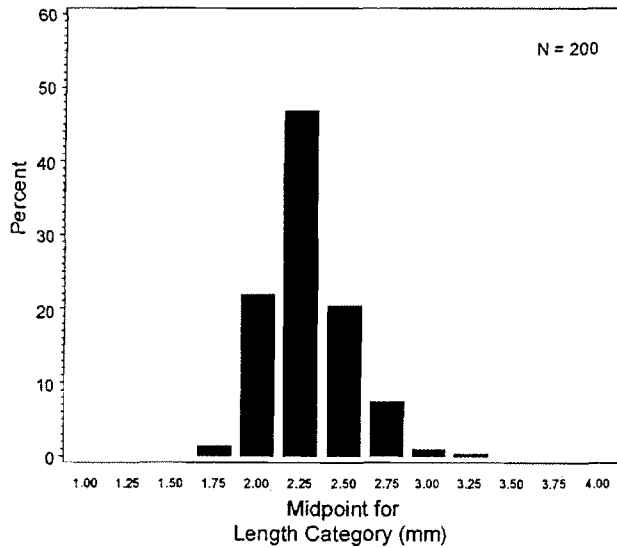


Figure 10. Length frequency of combtooth blenny larvae at entrapment and all source water stations combined. Data from sub-samples of all surveys in 2004–2005.

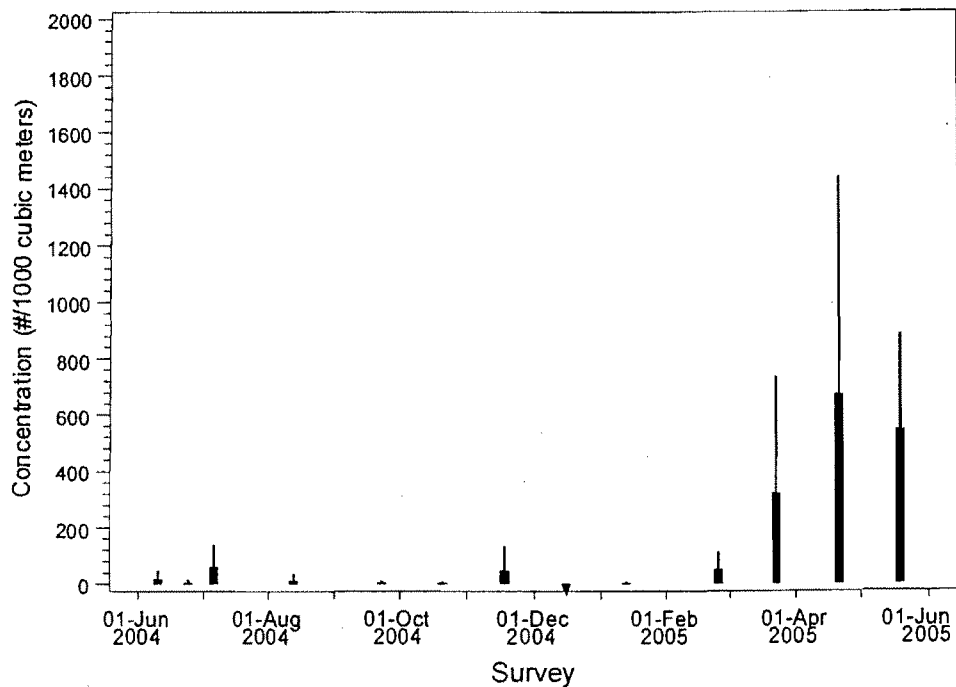


Figure 11. Comparison among surveys of mean concentration (#/1000 m³ [264,172 gal]) of anchovy larvae at entrapment Station E1. Note: downward pointing triangle indicates survey with no larvae collected.

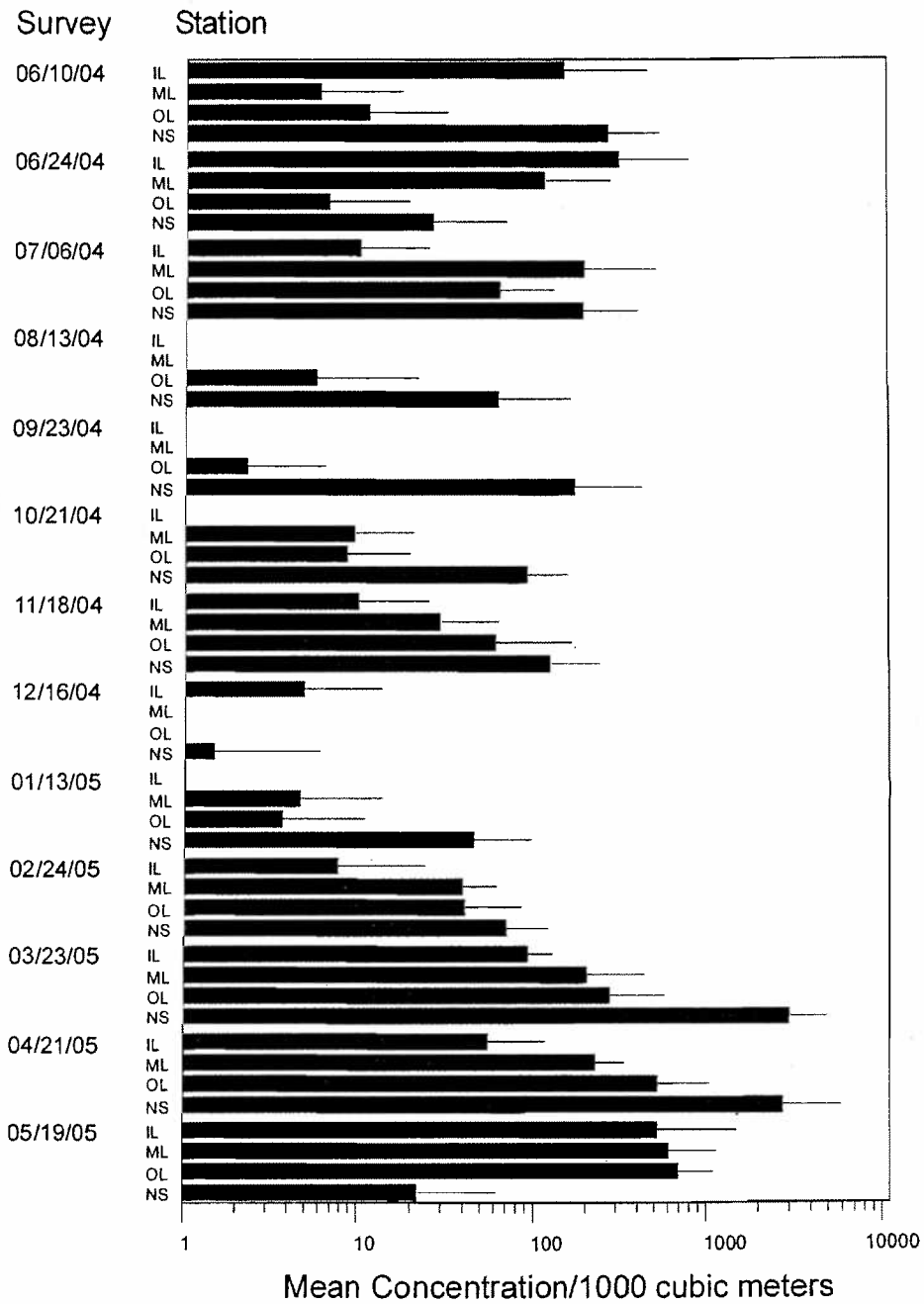


Figure 12. Mean concentration (#/1000 m³ [264,172 gal]) and standard error of anchovy larvae at Agua Hedionda Lagoon (inner, middle, and outer) and nearshore source water stations during the 2004 and 2005 sampling periods. Note logarithmic abundance scale.

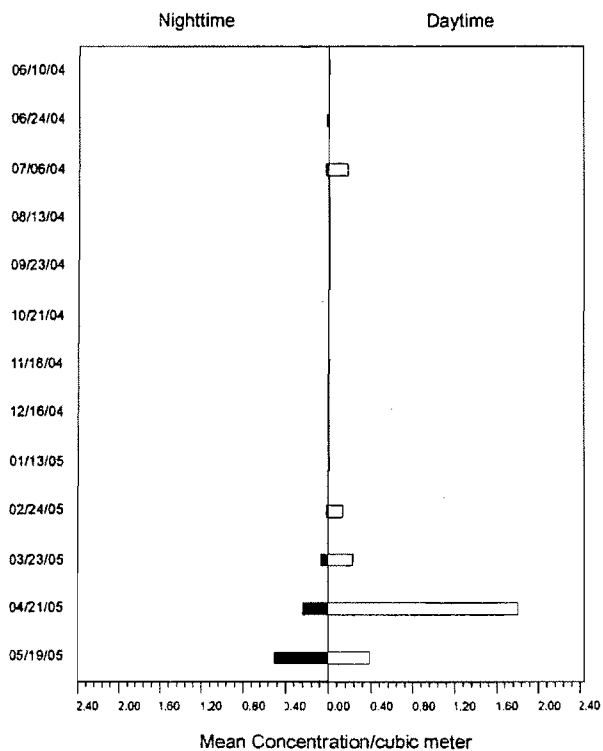


Figure 13. Mean concentration (#/1.0 m³ [264 gal]) of anchovy larvae at entrainment Station E1 during night (Cycle 3) and day (Cycle 1) sampling.

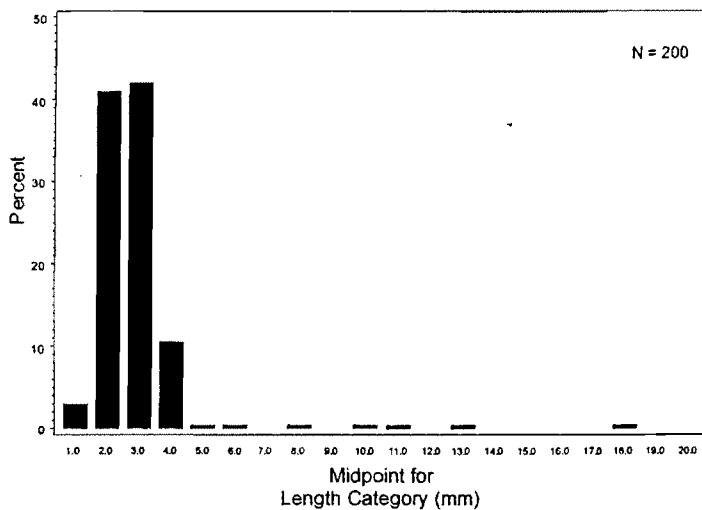


Figure 14. Length frequency of anchovy larvae at entrainment Station E1. Data from sub-samples of all surveys in 2004–2005.

Appendix A

Entrainment and Source Water Sampling Results by Survey

A1 – Entrainment

A2 – Source Water: Agua Hedionda Lagoon

A3 – Source Water: Nearshore

Table A1. Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at entrainment Station E1.

Taxon	Common Name	Survey Number:		1		2	
		Total	Mean	Count	Conc.	Count	Conc.
		Count	Conc.	Count	Conc.	Count	Conc.
		Survey Date:		06/10/04		06/24/04	
		Sample Count:		8		8	
Fishes							
1	Gobiidae unid.	12,762	2,222.69	609	2,059.68	576	1,622.60
2	<i>Hypsoblennius</i> spp.	5,838	1,107.67	784	2,712.14	438	1,197.26
3	<i>Engraulis mordax</i>	505	84.40	6	17.86	-	-
4	Engraulidae unid.	314	49.88	-	-	2	5.15
5	<i>Hypsypops rubicundus</i>	188	40.99	79	268.68	8	23.41
6	<i>Typhlogobius californiensis</i>	148	24.65	2	4.80	-	-
7	<i>Gibbonsia</i> spp.	125	22.45	3	11.11	2	5.24
8	Labrisomidae unid.	81	17.65	26	92.41	10	28.36
9	<i>Acanthogobius flavimanus</i>	87	14.41	-	-	-	-
10	larval fish fragment	56	9.65	8	25.54	-	-
11	larvae, unidentified yolksac	39	8.36	5	16.62	6	18.21
12	<i>Roncador stearnsi</i>	42	8.33	1	2.40	1	2.57
13	<i>Syngnathus leptorhynchus</i>	36	8.20	7	21.36	8	22.75
14	<i>Atheninopsis californiensis</i>	47	7.99	-	-	-	-
15	<i>Rimicola</i> spp.	43	7.92	3	9.95	1	2.49
16	<i>Syngnathus</i> spp.	47	7.85	2	6.39	-	-
17	<i>Genyonemus lineatus</i>	44	7.04	-	-	-	-
18	<i>Serphus politus</i>	29	5.50	2	6.65	-	-
19	<i>Paraclinus integripinnis</i>	31	4.95	-	-	-	-
20	<i>Paralichthys californicus</i>	21	3.73	1	2.40	-	-
21	<i>Sardinops sagax</i>	16	2.66	-	-	-	-
22	<i>Gillichthys mirabilis</i>	13	2.14	-	-	-	-
23	Sciaenidae unid.	11	1.86	-	-	1	2.49
24	<i>Hypsopsetta guttulata</i>	10	1.78	-	-	-	-
25	larval/post-larval fish unid.	10	1.61	1	2.40	-	-
26	<i>Citharichthys stigmatæus</i>	8	1.33	-	-	-	-
27	<i>Paralabrax</i> spp.	7	1.15	-	-	-	-
28	Atherinopsidae unid.	5	0.82	-	-	-	-
29	<i>Citharichthys sordidus</i>	5	0.79	-	-	-	-
30	<i>Paralabrax clathratus</i>	4	0.71	-	-	-	-
31	Pleuronectiformes unid.	4	0.63	-	-	-	-
32	<i>Heterostichus rostratus</i>	3	0.54	1	2.40	-	-
33	<i>Clinocottus analis</i>	3	0.51	-	-	-	-
34	<i>Stenobranchius leucopsarus</i>	2	0.37	-	-	-	-
35	<i>Atherinops affinis</i>	2	0.36	-	-	-	-
36	<i>Cheilotrema saturnum</i>	2	0.35	-	-	-	-
37	<i>Scomber japonicus</i>	1	0.35	1	4.51	-	-
38	<i>Quietula y-cauda</i>	1	0.25	-	-	-	-
39	Ophidiidae unid.	1	0.21	-	-	-	-
40	<i>Gobiesox</i> spp.	1	0.20	-	-	1	2.66
41	<i>Diaphus theta</i>	1	0.19	-	-	-	-
42	<i>Semicossyphus pulcher</i>	1	0.19	-	-	-	-
43	<i>Menticirthus undulatus</i>	1	0.18	-	-	-	-
44	Haemulidae unid.	1	0.18	-	-	-	-
45	Labridae unid.	1	0.17	-	-	-	-
46	Myctophidae unid.	1	0.16	-	-	-	-
47	<i>Symbolophorus californiensis</i>	1	0.16	-	-	-	-
48	<i>Oxyjulis californica</i>	1	0.14	-	-	-	-
49	<i>Citharichthys</i> spp.	1	0.13	-	-	-	-
Invertebrates							
	<i>Cancer anthonyi</i> (megalops)	1	2.21	-	-	-	-
		20,602		1,541		1,054	

Table A1 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at entrainment Station E1.

	Survey Number: 3		4		5		6	
	Survey Date: 07/06/04		08/13/04		09/23/04		10/21/04	
	Sample Count: 8		8		8		8	
Taxon	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
Fishes								
Gobiidae unid.	1,349	3,651.19	3,347	6,989.90	992	2,259.40	454	1,118.40
<i>Hypsoblennius</i> spp.	615	1,857.95	1,843	3,900.14	917	2,056.02	115	275.79
<i>Engraulis mordax</i>	7	19.60	-	-	2	4.55	2	4.43
Engraulidae unid.	17	41.45	6	11.44	-	-	-	-
<i>Hypsypops rubicundus</i>	24	76.54	8	16.58	-	-	-	-
<i>Typhlogobius californiensis</i>	1	3.57	-	-	-	-	-	-
<i>Gibbonsia</i> spp.	-	-	1	1.85	-	-	16	42.17
Labrisomidae unid.	20	52.50	2	4.38	20	45.30	1	2.62
<i>Acanthogobius flavimanus</i>	-	-	-	-	-	-	-	-
larval fish fragment	-	-	3	6.62	4	8.90	8	19.52
larvae, unidentified yolk sac	16	46.61	-	-	3	7.57	-	-
<i>Roncador steamsi</i>	11	34.26	1	2.09	28	67.03	-	-
<i>Syngnathus leptorhynchus</i>	19	57.50	-	-	-	-	1	2.83
<i>Atherinopsis californiensis</i>	-	-	-	-	-	-	-	-
<i>Rimicola</i> spp.	12	29.44	15	31.44	3	6.87	9	22.75
<i>Syngnathus</i> spp.	-	-	32	67.29	13	28.39	-	-
<i>Genyonemus lineatus</i>	-	-	1	1.93	7	16.59	-	-
<i>Seriplus politus</i>	-	-	3	6.38	22	53.74	2	4.77
<i>Paraclinus integripinnis</i>	-	-	31	64.39	-	-	-	-
<i>Paralichthys californicus</i>	-	-	1	2.09	5	13.58	2	5.23
<i>Sardinops sagax</i>	-	-	-	-	-	-	-	-
<i>Gillichthys mirabilis</i>	-	-	-	-	-	-	-	-
Sciaenidae unid.	1	3.20	-	-	3	6.64	1	2.62
<i>Hypsopsetta guttulata</i>	-	-	-	-	3	7.81	-	-
larval/post-larval fish unid.	1	2.39	5	9.76	-	-	-	-
<i>Citharichthys stigmaeus</i>	-	-	-	-	-	-	2	5.54
<i>Paralabrax</i> spp.	-	-	3	5.69	4	9.26	-	-
Atherinopsidae unid.	-	-	-	-	-	-	-	-
<i>Citharichthys sordidus</i>	-	-	-	-	-	-	-	-
<i>Paralabrax clathratus</i>	-	-	-	-	4	9.21	-	-
Pleuronectiformes unid.	-	-	-	-	-	-	-	-
<i>Heterostichus rostratus</i>	-	-	-	-	-	-	-	-
<i>Clinocottus analis</i>	-	-	-	-	-	-	-	-
<i>Stenobranchius leucopsarus</i>	-	-	-	-	-	-	-	-
<i>Atherinops affinis</i>	1	2.50	-	-	-	-	-	-
<i>Cheilotrema saturnum</i>	1	2.50	1	2.02	-	-	-	-
<i>Scomber japonicus</i>	-	-	-	-	-	-	-	-
<i>Quietula y-cauda</i>	1	3.20	-	-	-	-	-	-
Ophidiidae unid.	-	-	-	-	-	-	1	2.71
<i>Gobiesox</i> spp.	-	-	-	-	-	-	-	-
<i>Diaphus theta</i>	-	-	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>	-	-	-	-	-	-	-	-
<i>Menticirrhus undulatus</i>	1	2.39	-	-	-	-	-	-
Haemulidae unid.	-	-	-	-	1	2.29	-	-
Labridae unid.	-	-	-	-	1	2.19	-	-
Myctophidae unid.	-	-	-	-	-	-	-	-
<i>Symbolophorus californiensis</i>	-	-	-	-	-	-	-	-
<i>Oxyjulis californica</i>	-	-	-	-	-	-	-	-
<i>Citharichthys</i> spp.	-	-	-	-	-	-	-	-
Invertebrates								
<i>Cancer anthonyi</i> (megalops)	-	-	-	-	-	-	-	-
	2,097		5,303		2,032		614	

Table A1 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at entrainment Station E1.

	Survey Number: 7		8		9		10	
	Survey Date: 11/18/04		12/16/04		01/13/05		02/24/05	
	Sample Count: 8		8		8		8	
Taxon	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
Fishes								
Gobiidae unid.	203	411.13	102	233.48	118	263.27	555	1,179.31
<i>Hypsoblennius</i> spp.	151	320.89	5	11.75	4	8.53	-	-
<i>Engraulis mordax</i>	26	48.05	-	-	1	2.22	25	51.06
Engraulidae unid.	-	-	-	-	-	-	-	-
<i>Hypsypops rubicundus</i>	-	-	-	-	-	-	-	-
<i>Typhlogobius californiensis</i>	-	-	-	-	-	-	4	8.61
<i>Gibbonsia</i> spp.	7	13.96	6	13.51	61	141.98	11	22.93
Labrisomidae unid.	1	1.75	-	-	-	-	-	-
<i>Acanthogobius flavimanus</i>	-	-	-	-	19	44.01	63	133.24
larval fish fragment	2	3.95	-	-	1	2.28	4	8.48
larvae, unidentified yolk sac	-	-	-	-	-	-	-	-
<i>Roncador stearnsi</i>	-	-	-	-	-	-	-	-
<i>Syngnathus leptorhynchus</i>	-	-	-	-	-	-	-	-
<i>Atherinopsis californiensis</i>	-	-	2	4.93	13	29.82	22	47.31
<i>Rimicola</i> spp.	-	-	-	-	-	-	-	-
<i>Syngnathus</i> spp.	-	-	-	-	-	-	-	-
<i>Genyonemus lineatus</i>	4	7.92	1	2.47	3	6.50	13	26.67
<i>Seriphus politus</i>	-	-	-	-	-	-	-	-
<i>Paraclinus integripinnis</i>	-	-	-	-	-	-	-	-
<i>Paralichthys californicus</i>	1	1.75	1	2.22	2	4.40	3	5.75
<i>Sardinops sagax</i>	2	3.49	-	-	-	-	5	10.93
<i>Gillichthys mirabilis</i>	3	7.07	1	2.15	1	2.22	5	10.56
Sciaenidae unid.	1	1.85	-	-	-	-	-	-
<i>Hypsopsetta guttulata</i>	2	4.02	1	1.71	4	9.59	-	-
larval/post-larval fish unid.	-	-	-	-	3	6.33	-	-
<i>Citharichthys stigmatæus</i>	4	7.32	-	-	-	-	-	-
<i>Paralabrax</i> spp.	-	-	-	-	-	-	-	-
Atherinopsidae unid.	-	-	-	-	-	-	2	4.61
<i>Citharichthys sordidus</i>	3	5.24	-	-	-	-	-	-
<i>Paralabrax clathratus</i>	-	-	-	-	-	-	-	-
Pleuronectiformes unid.	3	5.70	-	-	-	-	-	-
<i>Heterostichus rostratus</i>	1	2.18	-	-	-	-	1	2.41
<i>Clinocottus analis</i>	-	-	1	2.20	1	2.28	1	2.15
<i>Stenobranchius leucopsarus</i>	-	-	-	-	2	4.82	-	-
<i>Atherinops affinis</i>	-	-	-	-	-	-	-	-
<i>Cheilotrema satrumum</i>	-	-	-	-	-	-	-	-
<i>Scomber japonicus</i>	-	-	-	-	-	-	-	-
<i>Quietula y-cauda</i>	-	-	-	-	-	-	-	-
Ophidiidae unid.	-	-	-	-	-	-	-	-
<i>Gobiesox</i> spp.	-	-	-	-	-	-	-	-
<i>Diaphus theta</i>	-	-	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>	-	-	-	-	-	-	-	-
<i>Menticirrhus undulatus</i>	-	-	-	-	-	-	-	-
Haemulidae unid.	-	-	-	-	-	-	-	-
Labridae unid.	-	-	-	-	-	-	-	-
Myctophidae unid.	-	-	-	-	-	-	-	-
<i>Symbolophorus californiensis</i>	-	-	-	-	-	-	-	-
<i>Oxyjulis californica</i>	-	-	-	-	-	-	-	-
<i>Citharichthys</i> spp.	-	-	-	-	-	-	-	-
Invertebrates								
<i>Cancer anthonyi</i> (megalops)	-	-	1	2.21	-	-	-	-
	414		121		233		714	

Table A1 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at entrainment Station E1

	Survey Number: 11		12		13	
	Survey Date: 03/23/05		04/21/05		05/19/05	
	Sample Count: 8		8		8	
Taxon	Count	Conc.	Count	Conc.	Count	Conc.
Fishes						
Gobiidae unid.	1,357	2,700.63	1,314	2,649.98	1,786	3,755.99
<i>Hypsoblennius</i> spp.	49	99.47	86	174.14	831	1,785.69
<i>Engraulis mordax</i>	89	182.27	284	642.95	63	124.21
Engraulidae unid.	60	140.57	14	28.03	215	421.84
<i>Hypsypops rubicundus</i>	-	-	15	30.54	54	117.11
<i>Typhlogobius californiensis</i>	110	238.12	17	34.38	14	31.01
<i>Gibbonsia</i> spp.	12	26.60	2	3.96	4	8.59
Labrisomidae unid.	-	-	-	-	1	2.13
<i>Acanthogobius flavimanus</i>	5	10.08	-	-	-	-
larval fish fragment	12	24.32	4	8.17	10	17.70
larvae, unidentified yolk sac	1	2.43	3	7.12	5	10.12
<i>Roncador steamsi</i>	-	-	-	-	-	-
<i>Syngnathus leptorhynchus</i>	-	-	-	-	1	2.21
<i>Atherinopsis californiensis</i>	10	21.80	-	-	-	-
<i>Rimicola</i> spp.	-	-	-	-	-	-
<i>Syngnathus</i> spp.	-	-	-	-	-	-
<i>Genyonemus lineatus</i>	5	9.18	10	20.28	-	-
<i>Serphus politus</i>	-	-	-	-	-	-
<i>Paraclinus integripinnis</i>	-	-	-	-	-	-
<i>Paralichthys californicus</i>	1	1.82	3	7.12	1	2.13
<i>Sardinops sagax</i>	1	1.86	8	18.35	-	-
<i>Gillichthys mirabilis</i>	2	3.89	1	1.88	-	-
Sciaenidae unid.	2	3.67	-	-	2	3.75
<i>Hypsopsetta guttulata</i>	-	-	-	-	-	-
larval/post-larval fish unid.	-	-	-	-	-	-
<i>Citharichthys stigmaeus</i>	-	-	2	4.37	-	-
<i>Paralabrax</i> spp.	-	-	-	-	-	-
Atherinopsidae unid.	-	-	2	3.89	1	2.21
<i>Citharichthys sordidus</i>	-	-	2	4.98	-	-
<i>Paralabrax clathratus</i>	-	-	-	-	-	-
Pleuronectiformes unid.	-	-	1	2.49	-	-
<i>Heterostichus rostratus</i>	-	-	-	-	-	-
<i>Clinocottus analis</i>	-	-	-	-	-	-
<i>Stenobranchius leucopsarus</i>	-	-	-	-	-	-
<i>Atherinops affinis</i>	-	-	-	-	1	2.21
<i>Chellotrema saturnum</i>	-	-	-	-	-	-
<i>Scomber japonicus</i>	-	-	-	-	-	-
<i>Quietula y-cauda</i>	-	-	-	-	-	-
Ophidiidae unid.	-	-	-	-	-	-
Gobiesox spp.	-	-	-	-	-	-
<i>Diaphus theta</i>	-	-	1	2.49	-	-
<i>Semicossyphus pulcher</i>	-	-	1	2.49	-	-
<i>Menticirrhus undulatus</i>	-	-	-	-	-	-
Haemulidae unid.	-	-	-	-	-	-
Labridae unid.	-	-	-	-	-	-
Myctophidae unid.	-	-	1	2.14	-	-
<i>Symbolophorus californiensis</i>	-	-	1	2.14	-	-
<i>Oxyjulis californica</i>	-	-	-	-	1	1.78
<i>Citharichthys</i> spp.	1	1.72	-	-	-	-
Invertebrates						
<i>Cancer anthonyi</i> (megalops)	-	-	-	-	-	-
	1,717		1,772		2,990	

Table A2. Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations L1-L4 in Agua Hedionda Lagoon.

Taxon	Common Name	Survey Number:		1		2	
		Total	Mean	Count	Conc.	Count	Conc.
		Count	Conc.	Count	Conc.	Count	Conc.
Fishes							
1	Gobiidae unid.	30,229	2,714.74	7,936	9,400.29	4,466	5,925.43
2	<i>Hypsoblennius</i> spp.	4,725	467.32	614	901.83	398	547.24
3	Engraulidae unid.	652	57.90	54	72.86	141	182.94
4	<i>Engraulis mordax</i>	558	45.51	2	2.79	1	1.33
5	<i>Acanthogobius flavimanus</i>	499	38.98	-	-	-	-
6	Labrisomidae unid.	366	35.30	166	220.73	71	93.10
7	<i>Hypsypops rubicundus</i>	352	35.12	94	134.38	53	76.48
8	<i>Atherinopsis californiensis</i>	279	23.93	-	-	-	-
9	<i>Gibbonsia</i> spp.	182	16.74	8	11.54	4	5.44
10	larval fish fragment	174	15.02	17	19.27	21	30.99
11	<i>Typhlogobius californiensis</i>	118	9.63	2	2.79	-	-
12	<i>Roncador steamsi</i>	74	6.82	1	1.29	-	-
13	Sciaenidae unid.	73	6.56	23	29.17	-	-
14	<i>Gillichthys mirabilis</i>	62	5.17	-	-	-	-
15	<i>Genyonemus lineatus</i>	54	4.25	2	2.14	-	-
16	<i>Rimicola eigenmanni</i>	53	4.13	-	-	-	-
17	Atherinopsidae unid.	41	3.40	3	3.43	-	-
18	<i>Rimicola</i> spp.	34	3.28	-	-	2	2.98
19	<i>Syngnathus leptorhynchus</i>	33	3.19	12	15.60	9	11.57
20	larvae, unidentified yolksac	32	3.12	5	8.47	-	-
21	<i>Paraclinus integripinnis</i>	31	2.88	-	-	-	-
22	<i>Seriphus politus</i>	26	2.40	1	1.64	5	5.51
23	<i>Atherinops affinis</i>	28	2.40	5	7.00	4	5.54
24	<i>Quietula y-cauda</i>	26	2.38	5	5.45	5	6.68
25	<i>Syngnathus</i> spp.	19	2.01	-	-	2	2.99
26	<i>Paralichthys californicus</i>	22	1.93	2	2.63	-	-
27	larval/post-larval fish unid.	16	1.36	-	-	-	-
28	<i>Ilypnus gilberti</i>	14	1.35	-	-	-	-
29	<i>Oxyjulis californica</i>	8	0.75	2	2.36	-	-
30	<i>Sardinops sagax</i>	9	0.74	-	-	-	-
31	<i>Citharichthys stigmaeus</i>	9	0.73	-	-	-	-
32	<i>Paralabrax</i> spp.	8	0.68	-	-	-	-
33	<i>Hypsopsetta guttulata</i>	7	0.55	-	-	-	-
34	<i>Leptocottus armatus</i>	6	0.51	-	-	-	-
35	<i>Gobiesox</i> spp.	5	0.49	-	-	2	3.29
36	<i>Menticirrhus undulatus</i>	5	0.47	-	-	-	-
37	<i>Cheilotrema saturnum</i>	4	0.36	-	-	-	-
38	Blennioidae unid.	4	0.36	1	1.11	1	1.40
39	<i>Citharichthys sordidus</i>	5	0.34	-	-	-	-
40	<i>Clinocottus analis</i>	4	0.31	-	-	-	-
41	<i>Xenistius californiensis</i>	3	0.30	-	-	-	-
42	<i>Xystreurus liolepis</i>	2	0.21	-	-	-	-
43	<i>Pleuronichthys ritleri</i>	2	0.17	-	-	-	-
44	Haemulidae unid.	2	0.17	-	-	-	-
45	<i>Sphyraena argentea</i>	2	0.17	-	-	-	-
46	<i>Triphoturus mexicanus</i>	2	0.16	-	-	-	-
47	Gobiesocidae unid.	2	0.15	-	-	-	-
48	<i>Clevelandia ios</i>	1	0.11	-	-	-	-
49	Syngnathidae unid.	1	0.11	-	-	-	-
50	Ophidiidae unid.	1	0.09	-	-	-	-
51	<i>Umbriina roncador</i>	1	0.09	-	-	-	-
52	<i>Lepidogobius lepidus</i>	1	0.09	-	-	-	-
53	<i>Pleuronichthys</i> spp.	1	0.08	-	-	-	-
54	<i>Atractoscion nobilis</i>	1	0.08	-	-	-	-
55	Pleuronectiformes unid.	1	0.07	-	-	-	-
56	<i>Clinocottus</i> spp.	1	0.07	-	-	-	-
57	<i>Citharichthys</i> spp.	1	0.06	-	-	-	-
58	<i>Semicossyphus pulcher</i>	1	0.06	1	0.78	-	-
Invertebrates							
	<i>Panulirus interruptus</i> (larvae)	2	0.21	-	-	-	-
	<i>Cancer antennarius</i> (megalops)	1	0.09	-	-	-	-
	<i>Cancer anthonyi</i> (megalops)	1	0.08	-	-	-	-
Totals:		38,876		8,958		5,185	

Table A2 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations L1-L4 in Agua Hedionda Lagoon.

	Survey Number: 3		4		5		6	
	Survey Date: 07/06/04		08/13/04		09/23/04		10/21/04	
	Sample Count: 16		16		20		16	
Taxon	Conc.	Count	Count	Conc.	Count	Conc.	Count	Conc.
Fishes								
Gobiidae unid.	3,034.53	30,229	1,498	1,925.13	1,115	1,272.53	550	690.51
<i>Hypsoblennius</i> spp.	1,053.95	4,725	1,004	1,421.30	360	398.18	245	290.58
Engraulidae unid.	57.39	652	-	-	-	-	-	-
<i>Engraulis mordax</i>	12.07	558	-	-	-	-	4	5.58
<i>Acanthogobius flavimanus</i>	-	499	-	-	-	-	-	-
Labrisomidae unid.	44.54	366	23	29.27	68	70.20	-	-
<i>Hypsypops rubicundus</i>	122.15	352	1	1.38	-	-	-	-
<i>Atherinopsis californiensis</i>	1.15	279	-	-	-	-	-	-
<i>Gibbonsia</i> spp.	4.46	182	1	1.38	3	3.04	12	19.17
larval fish fragment	4.41	174	9	10.98	3	3.48	8	9.95
<i>Typhlogobius californiensis</i>	11.38	118	-	-	-	-	-	-
<i>Roncador steamsi</i>	34.73	74	-	-	48	51.42	-	-
Sciaenidae unid.	10.27	73	4	4.85	17	17.20	-	-
<i>Gillichthys mirabilis</i>	-	62	-	-	-	-	-	-
<i>Genyonemus lineatus</i>	-	54	4	4.85	6	6.58	1	1.81
<i>Rimicola eigenmanni</i>	-	53	-	-	53	53.73	-	-
Atherinopsidae unid.	1.15	41	-	-	-	-	3	3.66
<i>Rimicola</i> spp.	6.03	34	-	-	9	9.96	10	13.61
<i>Syngnathus leptorhynchus</i>	7.04	33	-	-	5	4.97	1	1.33
larvae, unidentified yolk sac	12.08	32	6	7.87	2	2.11	-	-
<i>Paraclinus integripinnis</i>	-	31	31	37.45	-	-	-	-
<i>Serphus politus</i>	6.58	26	1	1.26	8	8.51	6	7.72
<i>Atherinops affinis</i>	1.15	28	-	-	-	-	-	-
<i>Quietula y-cauda</i>	2.29	26	4	5.80	1	1.01	-	-
<i>Syngnathus</i> spp.	-	19	15	20.83	-	-	1	1.09
<i>Paralichthys californicus</i>	1.63	22	1	1.21	7	7.51	2	3.18
larval/post-larval fish unid.	-	16	2	2.42	3	3.03	-	-
<i>Ilypnus gilberti</i>	-	14	3	4.46	-	-	-	-
<i>Oxyjulis californica</i>	-	8	5	6.24	-	-	-	-
<i>Sardinops sagax</i>	-	9	-	-	-	-	-	-
<i>Citharichthys stigmaeus</i>	1.36	9	1	1.20	2	2.12	-	-
<i>Paralabrax</i> spp.	-	8	3	3.63	5	5.24	-	-
<i>Hypsopsetta guttulata</i>	-	7	-	-	2	2.20	-	-
<i>Leptocottus armatus</i>	-	6	-	-	-	-	-	-
<i>Gobiesox</i> spp.	-	5	-	-	-	-	-	-
<i>Menticirrhus undulatus</i>	1.63	5	1	1.21	3	3.33	-	-
<i>Cheilotrema saturnum</i>	1.32	4	1	1.21	2	2.19	-	-
Blennioidei unid.	-	4	-	-	-	-	-	-
<i>Citharichthys sordidus</i>	-	5	-	-	-	-	-	-
<i>Clinocottus analis</i>	-	4	-	-	-	-	-	-
<i>Xenistius californiensis</i>	-	3	-	-	2	2.03	1	1.81
<i>Xystreurus liolepis</i>	2.77	2	-	-	-	-	-	-
<i>Pleuronichthys ritteri</i>	-	2	-	-	2	2.20	-	-
Haemulidae unid.	-	2	1	1.21	1	0.96	-	-
<i>Sphyræna argentea</i>	-	2	1	1.17	1	0.99	-	-
<i>Triphoturus mexicanus</i>	-	2	-	-	1	1.10	-	-
Gobiesocidae unid.	-	2	-	-	-	-	2	2.01
<i>Clevelandia ios</i>	-	1	1	1.45	-	-	-	-
Syngnathidae unid.	-	1	-	-	-	-	1	1.38
Ophidiidae unid.	-	1	1	1.21	-	-	-	-
<i>Umbina roncador</i>	-	1	-	-	1	1.21	-	-
<i>Lepidogobius lepidus</i>	-	1	-	-	-	-	-	-
<i>Pleuronichthys</i> spp.	-	1	-	-	1	1.10	-	-
<i>Atractoscion nobilis</i>	-	1	-	-	-	-	-	-
Pleuronectiformes unid.	-	1	-	-	-	-	-	-
<i>Clinocottus</i> spp.	-	1	-	-	-	-	-	-
<i>Citharichthys</i> spp.	-	1	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>	-	1	-	-	-	-	-	-
Invertebrates								
<i>Panulirus interruptus</i>	2.73	2	-	-	-	-	-	-
<i>Cancer antennarius</i> (megalops)	-	1	-	-	-	-	-	-
<i>Cancer anthonyi</i> (megalops)	-	1	-	-	1	1.01	-	-
		38,876	2,622		1,732		847	

Table A2 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations L1-L4 in Agua Hedionda Lagoon.

	Survey Number: 7		8		9		10		
	Survey Date: 11/18/04		12/16/04		01/13/05		02/24/05		
	Sample Count: 16		16		16		16		
Taxon	Total	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
Fishes									
Gobiidae unid.		706	734.73	1,032	1,201.76	368	402.81	1,873	1,867.75
<i>Hypsoblennius</i> spp.		59	61.74	4	5.26	3	3.22	2	2.05
Engraulidae unid.		2	2.12	-	-	2	2.42	-	-
<i>Engraulis mordax</i>		30	28.07	2	2.43	-	-	21	21.19
<i>Acanthogobius flavimanus</i>		-	-	-	-	140	152.20	300	298.81
Labrisomidae unid.		-	-	-	-	-	-	-	-
<i>Hypsypops rubicundus</i>		-	-	-	-	-	-	-	-
<i>Atheninopsis californiensis</i>		5	5.80	16	18.84	52	61.60	167	185.66
<i>Gibbonsia</i> spp.		13	13.30	56	65.83	43	52.02	21	20.79
larval fish fragment		11	11.11	11	12.69	-	-	49	48.54
<i>Typhlogobius californiensis</i>		-	-	2	2.23	-	-	8	8.22
<i>Roncador steamsi</i>		-	-	-	-	-	-	-	-
Sciaenidae unid.		-	-	-	-	3	3.65	-	-
<i>Gillichthys mirabilis</i>		4	4.25	21	24.94	14	14.54	15	15.16
<i>Genyonemus lineatus</i>		1	0.95	-	-	2	2.27	23	21.56
<i>Rimicola eigenmanni</i>		-	-	-	-	-	-	-	-
Atherinopsidae unid.		4	4.47	-	-	-	-	12	11.64
<i>Rimicola</i> spp.		1	1.14	5	5.82	-	-	-	-
<i>Syngnathus leptorhynchus</i>		-	-	-	-	-	-	1	0.94
larvae, unidentified yolk sac		-	-	1	1.31	-	-	-	-
<i>Paraclinus integripinnis</i>		-	-	-	-	-	-	-	-
<i>Senpulus politus</i>		-	-	-	-	-	-	-	-
<i>Atherinops affinis</i>		-	-	-	-	-	-	12	12.21
<i>Quietula y-cauda</i>		2	2.24	4	4.22	-	-	3	3.18
<i>Syngnathus</i> spp.		1	1.28	-	-	-	-	-	-
<i>Paralichthys californicus</i>		2	1.67	-	-	2	2.31	2	1.80
larval/post-larval fish unid.		-	-	-	-	10	11.33	1	0.89
<i>Ilypnus gilberti</i>		1	0.86	5	5.99	5	6.28	-	-
<i>Oxyjulis californica</i>		1	1.12	-	-	-	-	-	-
<i>Sardinops sagax</i>		-	-	-	-	1	1.23	4	4.40
<i>Citharichthys stigmæus</i>		1	0.81	-	-	-	-	-	-
<i>Paralabrax</i> spp.		-	-	-	-	-	-	-	-
<i>Hypsopsetta guttulata</i>		2	1.68	-	-	1	1.34	1	1.01
<i>Leptocottus armatus</i>		-	-	-	-	5	6.63	-	-
Gobiesox spp.		-	-	-	-	-	-	3	3.04
<i>Menticirrhus undulatus</i>		-	-	-	-	-	-	-	-
<i>Cheilotrema satunum</i>		-	-	-	-	-	-	-	-
Blennioidei unid.		-	-	1	1.24	-	-	1	0.94
<i>Citharichthys sordidus</i>		4	3.66	-	-	-	-	1	0.77
<i>Clinocottus analis</i>		-	-	2	2.27	-	-	2	1.74
<i>Xenistius californiensis</i>		-	-	-	-	-	-	-	-
<i>Xystreurus liolepis</i>		-	-	-	-	-	-	-	-
<i>Pleuronichthys ritteri</i>		-	-	-	-	-	-	-	-
Haemulidae unid.		-	-	-	-	-	-	-	-
<i>Sphyræna argentea</i>		-	-	-	-	-	-	-	-
<i>Triphoturus mexicanus</i>		1	0.95	-	-	-	-	-	-
Gobiesocidae unid.		-	-	-	-	-	-	-	-
<i>Clevelandia ios</i>		-	-	-	-	-	-	-	-
Syngnathidae unid.		-	-	-	-	-	-	-	-
Ophidiidae unid.		-	-	-	-	-	-	-	-
<i>Umbrina roncador</i>		-	-	-	-	-	-	-	-
<i>Lepidogobius lepidus</i>		-	-	-	-	1	1.18	-	-
<i>Pleuronichthys</i> spp.		-	-	-	-	-	-	-	-
<i>Atractoscion nobilis</i>		-	-	-	-	-	-	-	-
Pleuronectiformes unid.		-	-	-	-	-	-	-	-
<i>Clinocottus</i> spp.		-	-	1	0.93	-	-	-	-
<i>Citharichthys</i> spp.		1	0.81	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>		-	-	-	-	-	-	-	-
Invertebrates									
<i>Panulirus interruptus</i>		-	-	-	-	-	-	-	-
<i>Cancer antennarius</i> (megalops)		-	-	1	1.22	-	-	-	-
<i>Cancer anthonyi</i> (megalops)		-	-	-	-	-	-	-	-
		852		1,164		653		2,522	

Table A2 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations L1-L4 in Agua Hedionda Lagoon.

	Survey Number: 11		12		13	
	Survey Date: 03/23/05		04/21/05		05/19/05	
	Sample Count: 16		16		16	
Taxon	Count	Conc.	Count	Conc.	Count	Conc.
Fishes						
Gobiidae unid.	1,923	1,908.93	2,314	2,455.55	3,980	4,471.69
<i>Hypsoblennius</i> spp.	81	80.32	175	181.27	1,013	1,128.18
Engraulidae unid.	57	55.27	22	22.80	331	356.88
<i>Engraulis mordax</i>	104	98.45	151	155.03	235	264.72
<i>Acanthogobius flavimanus</i>	54	50.65	3	2.95	2	2.12
Labrisomidae unid.	-	-	-	-	1	1.06
<i>Hypsypops rubicundus</i>	-	-	62	63.71	48	58.49
<i>Athenopsis californiensis</i>	38	37.99	-	-	-	-
<i>Gibbonsia</i> spp.	4	4.30	4	4.07	10	12.22
larval fish fragment	16	15.83	14	14.73	12	13.31
<i>Typhlogobius californiensis</i>	85	84.34	10	10.82	4	5.36
<i>Roncador steamsi</i>	-	-	1	1.18	-	-
Sciaenidae unid.	7	6.96	6	5.27	6	6.88
<i>Gillichthys mirabilis</i>	5	5.20	3	3.16	-	-
<i>Genyonemus lineatus</i>	2	1.95	12	12.02	1	1.12
<i>Rimicola eigenmanni</i>	-	-	-	-	-	-
Atherinopsidae unid.	6	7.09	7	7.50	5	5.29
<i>Rimicola</i> spp.	-	-	-	-	3	3.09
<i>Syngnathus leptorhynchus</i>	-	-	-	-	-	-
larvae, unidentified yolksac	5	4.69	-	-	4	4.10
<i>Paraclinus integripinnis</i>	-	-	-	-	-	-
<i>Senphus politus</i>	-	-	-	-	-	-
<i>Atherinops affinis</i>	1	0.81	2	2.23	2	2.27
<i>Quietula y-cauda</i>	-	-	-	-	-	-
<i>Syngnathus</i> spp.	-	-	-	-	-	-
<i>Paralichthys californicus</i>	2	1.92	1	1.18	-	-
larval/post-larval fish unid.	-	-	-	-	-	-
<i>Ilypnus gilberti</i>	-	-	-	-	-	-
<i>Oxyjulis californica</i>	-	-	-	-	-	-
<i>Sardinops sagax</i>	-	-	4	3.93	-	-
<i>Citharichthys stigmatæus</i>	1	1.05	3	2.97	-	-
<i>Paralabrax</i> spp.	-	-	-	-	-	-
<i>Hypsopsetta guttulata</i>	1	0.89	-	-	-	-
<i>Leptocottus armatus</i>	-	-	-	-	-	-
Gobiesox spp.	-	-	-	-	-	-
<i>Menticirrhus undulatus</i>	-	-	-	-	-	-
<i>Cheilotrema saturnum</i>	-	-	-	-	-	-
Blennioidei unid.	-	-	-	-	-	-
<i>Citharichthys sordidus</i>	-	-	-	-	-	-
<i>Clinocottus analis</i>	-	-	-	-	-	-
<i>Xenistius californiensis</i>	-	-	-	-	-	-
<i>Xystreurus liolepis</i>	-	-	-	-	-	-
<i>Pleuronichthys nitteri</i>	-	-	-	-	-	-
Haemulidae unid.	-	-	-	-	-	-
<i>Sphyræna argentea</i>	-	-	-	-	-	-
<i>Triphoturus mexicanus</i>	-	-	-	-	-	-
Gobiesocidae unid.	-	-	-	-	-	-
<i>Clevelandia ios</i>	-	-	-	-	-	-
Syngnathidae unid.	-	-	-	-	-	-
Ophidiidae unid.	-	-	-	-	-	-
<i>Umbrina roncador</i>	-	-	-	-	-	-
<i>Lepidogobius lepidus</i>	-	-	-	-	-	-
<i>Pleuronichthys</i> spp.	-	-	-	-	-	-
<i>Atractoscion nobilis</i>	-	-	1	0.99	-	-
Pleuronectiformes unid.	-	-	1	0.93	-	-
<i>Clinocottus</i> spp.	-	-	-	-	-	-
<i>Citharichthys</i> spp.	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>	-	-	-	-	-	-
Invertebrates						
<i>Panulirus interruptus</i>	-	-	-	-	-	-
<i>Cancer antennarius</i> (megalops)	-	-	-	-	-	-
<i>Cancer anthonyi</i> (megalops)	-	-	-	-	-	-
	2,392		2,796		5,657	

Table A3. Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

		Survey Number:		1	2			
		Survey Date:		06/10/04	06/24/04			
		Sample Count:		20	19			
Taxon	Common Name	Total Count	Mean Conc.	Count	Conc.	Count	Conc.	
Fishes								
1	<i>Engraulis mordax</i>	6,318	423.31	285	211.27	27	24.69	
2	<i>Hypsoblennius</i> spp.	1,959	137.11	936	747.96	325	335.32	
3	Engraulidae unid.	1,313	102.17	80	54.22	2	1.74	
4	Gobiidae unid.	920	69.06	150	118.83	22	22.51	
5	<i>Genyonemus lineatus</i>	921	64.66	-	-	3	2.82	
6	larvae, unidentified yolksac	678	45.82	86	68.17	45	40.04	
7	<i>Paralichthys californicus</i>	601	42.91	39	28.28	45	40.90	
8	<i>Seriphus politus</i>	365	23.79	81	59.98	126	109.01	
9	Sciaenidae unid.	306	22.55	52	36.56	17	15.94	
10	<i>Roncador stearnsi</i>	286	20.17	105	84.11	66	63.55	
11	<i>Citharichthys stigmaeus</i>	309	20.01	7	5.17	11	10.03	
12	<i>Gibbonsia</i> spp.	277	19.29	36	29.62	5	6.93	
13	Labrisomidae unid.	219	16.36	87	73.38	47	48.08	
14	<i>Paralabrax clathratus</i>	213	14.12	29	20.88	43	36.99	
15	<i>Sardinops sagax</i>	202	13.21	3	1.99	-	-	
16	<i>Paralabrax</i> spp.	159	10.76	12	9.46	8	7.03	
17	larval fish fragment	145	10.50	13	9.98	11	9.51	
18	Haemulidae unid.	116	8.80	10	6.71	4	3.34	
19	<i>Scomber japonicus</i>	110	7.07	32	25.62	9	7.39	
20	<i>Hypsypops rubicundus</i>	110	7.03	84	66.63	6	5.73	
21	larval/post-larval fish unid.	93	6.81	8	5.67	5	4.57	
22	<i>Oxyjulis californica</i>	79	5.55	12	8.05	2	1.98	
23	<i>Paralabrax nebulifer</i>	82	5.08	-	-	2	1.67	
24	<i>Sphyræna argentea</i>	59	3.74	8	6.51	8	6.60	
25	<i>Xenistius californiensis</i>	55	3.61	-	-	31	25.82	
26	<i>Lepidogobius lepidus</i>	56	3.59	-	-	-	-	
27	<i>Stenobranchius leucopsarus</i>	51	3.26	-	-	-	-	
28	<i>Pleuronichthys verticalis</i>	43	2.79	-	-	3	2.56	
29	<i>Atherinopsis californiensis</i>	35	2.78	-	-	-	-	
30	<i>Umbrina roncador</i>	39	2.62	1	0.71	24	21.89	
31	<i>Pleuronichthys ritteri</i>	34	2.51	-	-	-	-	
32	<i>Xystreurus liolepis</i>	27	1.97	-	-	-	-	
33	<i>Hypsopsetta guttulata</i>	30	1.97	-	-	-	-	
34	<i>Rimicola</i> spp.	22	1.79	-	-	-	-	
35	<i>Pepilius simillimus</i>	28	1.78	-	-	15	12.77	
36	<i>Cheilotrema saturnum</i>	24	1.71	6	4.76	4	3.79	
37	<i>Semicossyphus pulcher</i>	21	1.49	6	4.23	-	-	
38	<i>Ophidion scrippsae</i>	22	1.48	-	-	-	-	
39	<i>Diaphus theta</i>	24	1.46	1	0.76	1	0.83	
40	<i>Acanthogobius flavimanus</i>	22	1.46	-	-	-	-	
41	<i>Pleuronichthys</i> spp.	19	1.30	-	-	1	0.83	
42	Pleuronectiformes unid.	21	1.25	-	-	-	-	
43	<i>Menticirthus undulatus</i>	16	1.21	4	3.04	4	4.05	
44	<i>Atractoscion nobilis</i>	18	1.18	2	1.48	9	8.43	
45	Ophidiidae unid.	15	1.14	-	-	-	-	
46	<i>Sebastes</i> spp.	18	1.09	-	-	-	-	
47	<i>Girella nigricans</i>	16	1.06	2	1.36	1	0.80	
48	<i>Typhlogobius californiensis</i>	15	0.99	4	3.24	1	0.81	
49	<i>Citharichthys sordidus</i>	16	0.99	-	-	1	0.83	
50	Pleuronectidae unid.	16	0.98	-	-	-	-	
51	<i>Trachurus symmetricus</i>	17	0.96	13	9.40	-	-	
52	<i>Halichoeres semicinctus</i>	15	0.95	-	-	-	-	
53	<i>Syngnathus</i> spp.	10	0.84	-	-	1	0.81	
54	Labridae	11	0.83	-	-	-	-	

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

		Survey Number:		1	2		
		Survey Date:		06/10/04	06/24/04		
		Sample Count:		20	19		
Taxon	Common Name	Total Count	Mean Conc.	Count	Conc.	Count	Conc.
Fishes							
55	<i>Paraclinus integripinnis</i>	14	0.81	7	4.25	-	-
56	<i>Symphurus atricauda</i>	11	0.77	-	-	-	-
57	<i>Triphoturus mexicanus</i>	12	0.73	-	-	1	0.83
58	<i>Citharichthys</i> spp.	9	0.70	-	-	1	0.83
59	<i>Nannobranchium</i> spp.	9	0.57	-	-	-	-
60	<i>Medialuna californiensis</i>	7	0.53	2	1.69	-	-
61	<i>Gillichthys mirabilis</i>	8	0.51	-	-	-	-
62	<i>Chilara taylori</i>	7	0.50	-	-	-	-
63	<i>Heterostichus rostratus</i>	7	0.50	1	1.00	1	1.39
64	<i>Hypsoblennius jenkinsi</i>	7	0.46	-	-	-	-
65	<i>Paralichthyidae</i> unid.	7	0.44	-	-	-	-
66	<i>Atherinopsidae</i>	4	0.31	-	-	-	-
67	<i>Parophrys vetulus</i>	5	0.30	-	-	-	-
68	<i>Myctophidae</i> unid.	4	0.30	-	-	-	-
69	<i>Hippoglossina stomata</i>	5	0.29	-	-	-	-
70	<i>Zaniolepis frenata</i>	5	0.25	-	-	-	-
71	<i>Ruscarius creaseri</i>	3	0.22	-	-	-	-
72	<i>Clupeiformes</i>	3	0.21	2	1.92	-	-
73	<i>Syngnathus leptorhynchus</i>	3	0.18	3	2.37	-	-
74	<i>Clupeidae</i> unid.	3	0.18	-	-	-	-
75	<i>Lyopsetta exilis</i>	3	0.16	-	-	-	-
76	<i>Pomacentridae</i>	2	0.14	-	-	-	-
77	<i>Rhinogobiops nicholsi</i>	2	0.14	-	-	-	-
78	<i>Nannobranchium nitteri</i>	2	0.13	-	-	-	-
79	<i>Cyclothone</i> spp.	2	0.13	-	-	-	-
80	<i>Chromis punctipinnis</i>	2	0.13	-	-	-	-
81	<i>Icelinus</i> spp.	3	0.13	-	-	-	-
82	<i>Gobiesocidae</i> unid.	2	0.12	1	0.88	-	-
83	<i>Anisotremus davidsonii</i>	2	0.12	-	-	-	-
84	<i>Sebastes jordani</i>	2	0.10	-	-	-	-
85	<i>Blennioidei</i>	1	0.08	-	-	-	-
86	<i>Clinidae</i> unid.	1	0.08	1	1.00	-	-
87	<i>Chaenopsidae</i> unid.	1	0.07	-	-	-	-
88	<i>Leptocottus armatus</i>	1	0.07	-	-	-	-
89	<i>Cynoglossidae</i>	1	0.07	-	-	-	-
90	<i>Kyphosidae</i>	1	0.07	-	-	-	-
91	<i>Cyclothone acclinidens</i>	1	0.07	-	-	-	-
92	<i>Ilypnus gilberti</i>	1	0.06	-	-	-	-
93	<i>Gobiesox</i> spp.	1	0.06	-	-	-	-
94	<i>Hexagrammidae</i> unid.	1	0.06	-	-	-	-
95	<i>Bathylagus ochotensis</i>	1	0.06	-	-	-	-
96	<i>Hypsoblennius gentilis</i>	1	0.05	1	0.64	-	-
Invertebrates							
	<i>Panulirus interruptus</i> (larvae)	98	7.04	1	0.82	71	64.80
	<i>Cancer anthonyi</i> (megalops)	80	4.74	-	-	2	2.38
	<i>Cancer antennarius</i> (megalops)	71	4.11	-	-	3	3.15
	<i>Cancer gracilis</i> (megalops)	48	2.93	2	1.35	-	-
	<i>Cancer</i> spp. (megalops)	4	0.23	-	-	-	-
	<i>Cancer productus</i> (megalops)	3	0.22	-	-	-	-
Totals:		17,067		40,384		39,197	

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

Taxon	3		4		5		6	
	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
Fishes								
<i>Engraulis mordax</i>	214	168.35	73	62.19	204	167.31	94	81.59
<i>Hypsoblennius</i> spp.	183	181.20	234	255.74	64	66.94	1	0.90
Engraulidae unid.	24	19.48	-	-	3	2.95	8	9.23
Gobiidae unid.	86	82.38	154	190.83	48	52.35	44	48.00
<i>Genyonemus lineatus</i>	13	10.58	12	14.77	300	280.83	33	25.28
larvae, unidentified yolk sac	347	291.29	72	75.56	60	58.18	16	15.29
<i>Paralichthys californicus</i>	194	173.39	37	38.97	170	171.01	32	30.06
<i>Seriphus politus</i>	50	42.17	8	6.62	97	88.33	2	1.94
Sciaenidae unid.	102	99.70	25	28.73	39	38.37	6	4.90
<i>Roncador steamsi</i>	52	47.53	10	10.18	53	56.79	-	-
<i>Citharichthys stigmaeus</i>	16	14.03	5	4.29	158	124.03	93	85.55
<i>Gibbonsia</i> spp.	4	4.35	3	3.96	2	2.46	11	11.57
Labrisomidae unid.	46	46.77	22	27.32	15	15.46	1	0.90
<i>Paralabrax clathratus</i>	34	27.63	2	1.75	105	96.31	-	-
<i>Sardinops sagax</i>	9	8.07	5	4.93	25	22.04	3	2.47
<i>Paralabrax</i> spp.	50	40.52	31	29.86	55	50.38	2	1.92
larval fish fragment	41	35.90	16	19.10	29	30.59	6	5.77
Haemulidae unid.	5	4.12	4	2.79	91	95.77	2	1.68
<i>Scomber japonicus</i>	39	30.95	-	-	29	27.04	1	0.89
<i>Hypsypops rubicundus</i>	13	11.43	1	1.32	-	-	-	-
larval/post-larval fish unid.	39	34.86	14	17.27	16	16.26	6	5.81
<i>Oxyjulis californica</i>	17	15.21	16	16.22	17	17.56	9	7.70
<i>Paralabrax nebulifer</i>	-	-	-	-	80	64.38	-	-
<i>Sphyaena argentea</i>	27	20.12	9	8.12	7	7.31	-	-
<i>Xenistius californiensis</i>	-	-	2	1.90	22	19.24	-	-
<i>Lepidogobius lepidus</i>	-	-	1	1.18	3	2.32	-	-
<i>Stenobranchius leucopsarus</i>	-	-	-	-	-	-	-	-
<i>Pleuronichthys verticalis</i>	10	7.29	3	3.18	18	15.33	2	1.69
<i>Atherinopsis californiensis</i>	-	-	-	-	-	-	-	-
<i>Umbrina roncador</i>	14	11.41	-	-	-	-	-	-
<i>Pleuronichthys ritteri</i>	4	3.41	5	5.87	15	14.28	6	5.25
<i>Xystreurus liolepis</i>	12	11.12	1	1.14	9	9.07	3	2.82
<i>Hypsopsetta guttulata</i>	-	-	2	1.93	8	7.31	6	4.26
<i>Rimicola</i> spp.	2	1.96	-	-	12	13.28	3	3.20
<i>Pepilus similimus</i>	6	4.66	-	-	4	3.42	-	-
<i>Cheilotrema saturnum</i>	10	9.25	1	0.80	3	3.60	-	-
<i>Semicossyphus pulcher</i>	1	1.05	3	2.95	8	8.18	2	2.27
<i>Ophidion scrippsae</i>	-	-	6	6.04	11	8.98	4	3.21
<i>Diaphus theta</i>	1	0.81	-	-	3	2.41	1	0.89
<i>Acanthogobius flavimanus</i>	-	-	-	-	-	-	-	-
<i>Pleuronichthys</i> spp.	1	0.52	1	1.14	11	9.76	3	3.18
Pleuronectiformes unid.	-	-	-	-	1	0.78	5	3.67
<i>Menticirrhus undulatus</i>	-	-	2	2.14	6	6.54	-	-
<i>Atractoscion nobilis</i>	5	3.58	-	-	-	-	-	-
Ophidiidae unid.	-	-	1	0.93	5	5.38	8	7.74
<i>Sebastes</i> spp.	-	-	1	1.14	2	1.85	-	-
<i>Girella nigricans</i>	-	-	-	-	3	2.62	6	5.49
<i>Typhlogobius californiensis</i>	-	-	1	0.60	-	-	-	-
<i>Citharichthys sordidus</i>	-	-	-	-	2	1.53	2	1.89
Pleuronectidae unid.	-	-	-	-	1	0.76	-	-
<i>Trachurus symmetricus</i>	-	-	-	-	-	-	2	1.76
<i>Halichoeres semicinctus</i>	1	0.81	-	-	10	8.07	4	3.52
<i>Syngnathus</i> spp.	-	-	6	7.95	1	0.78	-	-
Labridae	7	6.83	1	1.34	-	-	1	0.68

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

Taxon	3		4		5		6	
	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
Fishes								
<i>Paraclinus integripinnis</i>	-	-	7	6.28	-	-	-	-
<i>Symphurus atricauda</i>	-	-	-	-	10	8.81	1	1.23
<i>Triphoturus mexicanus</i>	-	-	1	0.60	6	5.23	2	1.30
<i>Citharichthys</i> spp.	-	-	1	1.14	-	-	3	3.36
<i>Nannobranchium</i> spp.	-	-	-	-	-	-	-	-
<i>Medialuna californiensis</i>	-	-	4	4.48	-	-	1	0.68
<i>Gillichthys mirabilis</i>	-	-	-	-	-	-	-	-
<i>Chilara taylori</i>	-	-	-	-	-	-	6	5.72
<i>Heterostichus rostratus</i>	-	-	-	-	-	-	-	-
<i>Hypsoblennius jenkinsi</i>	-	-	1	0.70	5	4.55	1	0.68
Paralichthyidae unid.	2	1.04	-	-	1	1.11	-	-
Atherinopsidae	-	-	-	-	-	-	-	-
<i>Parophrys vetulus</i>	-	-	-	-	-	-	-	-
Myctophidae unid.	1	1.21	-	-	1	0.75	-	-
<i>Hippoglossina stomata</i>	-	-	1	0.78	2	1.52	-	-
<i>Zaniolepis frenata</i>	-	-	-	-	-	-	-	-
<i>Ruscarius creaseri</i>	-	-	-	-	-	-	-	-
Clupeiformes	-	-	-	-	-	-	-	-
<i>Syngnathus leptorhynchus</i>	-	-	-	-	-	-	-	-
Clupeidae unid.	1	0.71	-	-	-	-	1	0.89
<i>Lyopsetta exilis</i>	-	-	-	-	-	-	-	-
Pomacentridae	-	-	1	0.97	-	-	1	0.90
<i>Rhinogobiops nicholsi</i>	-	-	-	-	1	1.01	-	-
<i>Nannobranchium ritteri</i>	-	-	-	-	-	-	-	-
<i>Cyclothone</i> spp.	-	-	-	-	1	0.77	-	-
<i>Chromis punctipinnis</i>	-	-	-	-	-	-	1	0.83
<i>Icelinus</i> spp.	-	-	-	-	-	-	-	-
Gobiesocidae unid.	-	-	-	-	-	-	-	-
<i>Anisotremus davidsonii</i>	1	0.67	-	-	1	0.90	-	-
<i>Sebastes jordani</i>	-	-	-	-	-	-	-	-
Blennioidei	1	1.05	-	-	-	-	-	-
Clinidae unid.	-	-	-	-	-	-	-	-
Chaenopsidae unid.	-	-	-	-	-	-	-	-
<i>Leptocottus armatus</i>	-	-	-	-	-	-	-	-
Cynoglossidae	-	-	-	-	-	-	1	0.89
Kyphosidae	-	-	-	-	-	-	1	0.89
<i>Cyclothone acclinidens</i>	-	-	-	-	-	-	-	-
<i>Ilypnus gilberti</i>	-	-	-	-	-	-	-	-
<i>Gobiesox</i> spp.	-	-	-	-	-	-	-	-
Hexagrammidae unid.	-	-	-	-	1	0.75	-	-
<i>Bathylagus ochotensis</i>	-	-	-	-	-	-	-	-
<i>Hypsoblennius gentilis</i>	-	-	-	-	-	-	-	-
Invertebrates								
<i>Panulirus interruptus</i>	19	18.79	5	5.56	2	1.49	-	-
<i>Cancer anthonyi</i> (megalops)	29	22.66	17	11.75	16	12.25	1	0.63
<i>Cancer antennarius</i> (megalops)	1	0.67	50	35.14	4	3.35	2	2.08
<i>Cancer gracilis</i> (megalops)	-	-	33	26.49	6	4.92	-	-
<i>Cancer</i> spp. (megalops)	-	-	4	2.93	-	-	-	-
<i>Cancer productus</i> (megalops)	-	-	1	1.32	-	-	-	-
	39,931		39,152	959	40,160		38,757	

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

Taxon	7		8		9		10	
	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
	11/18/04		12/16/04		01/13/05		02/24/05	
	20		20		20		20	
Fishes								
<i>Engraulis mordax</i>	153	122.98	2	1.47	43	35.34	82	68.40
<i>Hypsoblennius</i> spp.	10	8.40	1	0.76	-	-	-	-
Engraulidae unid.	-	-	-	-	11	10.07	2	1.62
Gobiidae unid.	22	17.02	21	17.62	38	33.74	125	118.27
<i>Genyonemus lineatus</i>	78	63.14	8	6.99	46	38.44	143	124.31
larvae, unidentified yolksac	1	0.76	-	-	8	6.08	11	9.22
<i>Paralichthys californicus</i>	11	8.76	3	2.80	5	4.30	20	17.53
<i>Seriphus politus</i>	-	-	-	-	-	-	-	-
Sciaenidae unid.	1	0.67	-	-	6	5.75	3	3.04
<i>Roncador steamsi</i>	-	-	-	-	-	-	-	-
<i>Cithanichthys stigmæus</i>	12	10.73	2	1.75	-	-	1	0.67
<i>Gibbonsia</i> spp.	6	5.19	40	32.33	61	57.65	52	48.45
Labrisomidae unid.	-	-	-	-	-	-	-	-
<i>Paralabrax clathratus</i>	-	-	-	-	-	-	-	-
<i>Sardinops sagax</i>	5	4.12	-	-	-	-	34	26.67
<i>Paralabrax</i> spp.	-	-	-	-	-	-	-	-
larval fish fragment	7	6.37	1	0.89	2	1.69	4	3.60
Haemulidae unid.	-	-	-	-	-	-	-	-
<i>Scomber japonicus</i>	-	-	-	-	-	-	-	-
<i>Hypsypops rubicundus</i>	-	-	-	-	-	-	-	-
larval/post-larval fish unid.	-	-	-	-	2	1.90	-	-
<i>Oxyjulis californica</i>	-	-	-	-	1	0.81	-	-
<i>Paralabrax nebulifer</i>	-	-	-	-	-	-	-	-
<i>Sphyræna argentea</i>	-	-	-	-	-	-	-	-
<i>Xenistius californiensis</i>	-	-	-	-	-	-	-	-
<i>Lepidogobius lepidus</i>	13	9.84	4	4.20	20	16.88	4	3.75
<i>Stenobranchius leucopsarus</i>	-	-	-	-	41	34.59	-	-
<i>Pleuronichthys verticalis</i>	1	1.08	-	-	-	-	-	-
<i>Atherinopsis californiensis</i>	-	-	3	2.10	10	9.29	7	6.78
<i>Umbrina roncador</i>	-	-	-	-	-	-	-	-
<i>Pleuronichthys ritteri</i>	-	-	-	-	2	1.77	-	-
<i>Xysteuropsis liolepis</i>	1	0.77	-	-	-	-	-	-
<i>Hypsopsetta guttulata</i>	2	1.51	1	1.05	8	6.75	2	1.60
<i>Rimicola</i> spp.	-	-	1	1.05	3	2.59	1	1.15
<i>Peprius simillimus</i>	-	-	-	-	-	-	-	-
<i>Cheilotrema satumum</i>	-	-	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>	-	-	-	-	-	-	-	-
<i>Ophidion scrippsae</i>	1	0.95	-	-	-	-	-	-
<i>Diaphus theta</i>	-	-	-	-	-	-	-	-
<i>Acanthogobius flavimanus</i>	-	-	-	-	11	8.45	8	8.00
<i>Pleuronichthys</i> spp.	-	-	-	-	-	-	-	-
Pleuronectiformes unid.	10	7.45	-	-	-	-	-	-
<i>Menticirrus undulatus</i>	-	-	-	-	-	-	-	-
<i>Atractoscion nobilis</i>	-	-	-	-	-	-	-	-
Ophidiidae unid.	1	0.76	-	-	-	-	-	-
<i>Sebastes</i> spp.	7	5.29	6	4.35	-	-	-	-
<i>Girella nigricans</i>	4	3.47	-	-	-	-	-	-
<i>Typhlogobius californiensis</i>	-	-	-	-	-	-	2	1.80
<i>Cithanichthys sordidus</i>	9	7.31	-	-	-	-	-	-
Pleuronectidae unid.	1	0.88	-	-	-	-	-	-
<i>Trachurus symmetricus</i>	-	-	-	-	-	-	-	-
<i>Halichoeres semicinctus</i>	-	-	-	-	-	-	-	-
<i>Syngnathus</i> spp.	-	-	1	0.74	1	0.66	-	-
Labridae	-	-	-	-	-	-	-	-

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

Taxon	7		8		9		10	
	Count	Conc.	Count	Conc.	Count	Conc.	Count	Conc.
	11/18/04		12/16/04		01/13/05		02/24/05	
	20		20		20		20	
Fishes								
<i>Paraclinus integripinnis</i>	-	-	-	-	-	-	-	-
<i>Symphurus atnicauda</i>	-	-	-	-	-	-	-	-
<i>Triphoturus mexicanus</i>	2	1.54	-	-	-	-	-	-
<i>Citharichthys</i> spp.	-	-	1	0.89	2	1.60	-	-
<i>Nannobranchium</i> spp.	1	0.76	1	0.84	4	3.51	1	0.90
<i>Medialuna californiensis</i>	-	-	-	-	-	-	-	-
<i>Gillichthys mirabilis</i>	-	-	1	0.72	4	3.37	3	2.59
<i>Chilara taylori</i>	1	0.81	-	-	-	-	-	-
<i>Heterostichus rostratus</i>	2	1.83	1	0.88	2	1.35	-	-
<i>Hypsoblennius jenkinsi</i>	-	-	-	-	-	-	-	-
Paralichthyidae unid.	2	1.95	-	-	1	1.01	1	0.61
Atherinopsidae	1	0.84	-	-	-	-	-	-
<i>Parophrys vetulus</i>	-	-	-	-	-	-	-	-
Myctophidae unid.	-	-	-	-	1	0.96	-	-
<i>Hippoglossina stomata</i>	2	1.49	-	-	-	-	-	-
<i>Zaniolepis frenata</i>	-	-	1	0.64	2	1.33	1	0.70
<i>Ruscarius creaseri</i>	-	-	-	-	1	0.68	-	-
Clupeiformes	-	-	-	-	-	-	1	0.78
<i>Syngnathus leptorhynchus</i>	-	-	-	-	-	-	-	-
Clupeidae unid.	-	-	-	-	-	-	1	0.67
<i>Lyopsetta exilis</i>	-	-	-	-	-	-	-	-
Pomacentridae	-	-	-	-	-	-	-	-
<i>Rhinogobiops nicholsi</i>	1	0.85	-	-	-	-	-	-
<i>Nannobranchium ritteri</i>	2	1.75	-	-	-	-	-	-
<i>Cyclothone</i> spp.	-	-	-	-	-	-	1	0.90
<i>Chromis punctipinnis</i>	1	0.82	-	-	-	-	-	-
<i>Icelinus</i> spp.	-	-	-	-	-	-	-	-
Gobiesocidae unid.	-	-	1	0.72	-	-	-	-
<i>Anisotremus davidsonii</i>	-	-	-	-	-	-	-	-
<i>Sebastes jordani</i>	-	-	-	-	2	1.33	-	-
Blennioidei	-	-	-	-	-	-	-	-
Clinidae unid.	-	-	-	-	-	-	-	-
Chaenopsidae unid.	-	-	-	-	-	-	1	0.97
<i>Leptocottus armatus</i>	-	-	-	-	-	-	1	0.90
Cynoglossidae	-	-	-	-	-	-	-	-
Kyphosidae	-	-	-	-	-	-	-	-
<i>Cyclothone acclinidens</i>	1	0.85	-	-	-	-	-	-
<i>Ilypnus gilberti</i>	-	-	1	0.84	-	-	-	-
Gobiesox spp.	-	-	-	-	-	-	-	-
Hexagrammidae unid.	-	-	-	-	-	-	-	-
<i>Bathylagus ochotensis</i>	-	-	-	-	-	-	-	-
<i>Hypsoblennius gentilis</i>	-	-	-	-	-	-	-	-
Invertebrates								
<i>Panulirus interruptus</i>	-	-	-	-	-	-	-	-
<i>Cancer anthonyi</i> (megalops)	8	5.93	2	1.26	3	2.96	1	1.01
<i>Cancer antennarius</i> (megalops)	4	2.91	1	1.12	-	-	-	-
<i>Cancer gracilis</i> (megalops)	2	1.44	2	1.73	1	1.05	-	-
<i>Cancer</i> spp. (megalops)	-	-	-	-	-	-	-	-
<i>Cancer productus</i> (megalops)	-	-	-	-	-	-	-	-
	38,722		38,471		38,736		38,950	

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

Taxon	11		12		13	
	03/23/05		04/21/05		05/19/05	
	15		20		20	
Taxon	Count	Conc.	Count	Conc.	Count	Conc.
Fishes						
<i>Engraulis mordax</i>	1,767	1,805.85	3,356	2,740.48	18	13.11
<i>Hypsoblennius</i> spp.	3	3.31	11	8.69	191	173.15
Engraulidae unid.	1,163	1,211.29	10	8.62	10	8.93
Gobiidae unid.	98	99.04	21	20.98	91	76.18
<i>Genyonemus lineatus</i>	234	235.43	45	33.43	6	4.54
larvae, unidentified yolk sac	19	20.47	2	1.58	11	9.07
<i>Paralichthys californicus</i>	28	27.91	11	9.12	6	4.78
<i>Seriphus politus</i>	-	-	1	1.22	-	-
Sciaenidae unid.	38	44.51	6	5.95	11	9.01
<i>Roncador steamsi</i>	-	-	-	-	-	-
<i>Citharichthys stigmæus</i>	2	1.93	2	2.00	-	-
<i>Gibbonsia</i> spp.	15	15.39	2	2.29	40	30.54
Labrisomidae unid.	-	-	1	0.74	-	-
<i>Paralabrax clathratus</i>	-	-	-	-	-	-
<i>Sardinops sagax</i>	-	-	118	101.46	-	-
<i>Paralabrax</i> spp.	-	-	1	0.69	-	-
larval fish fragment	5	5.02	8	6.78	2	1.32
Haemulidae unid.	-	-	-	-	-	-
<i>Scomber japonicus</i>	-	-	-	-	-	-
<i>Hypsopops rubicundus</i>	-	-	1	0.94	5	5.36
larval/post-larval fish unid.	-	-	2	1.69	1	0.55
<i>Oxyjulis californica</i>	1	1.20	4	3.35	-	-
<i>Paralabrax nebulifer</i>	-	-	-	-	-	-
<i>Sphyræna argentea</i>	-	-	-	-	-	-
<i>Xenistius californiensis</i>	-	-	-	-	-	-
<i>Lepidogobius lepidus</i>	3	2.73	2	1.99	6	3.84
<i>Stenobranchius leucopsarus</i>	-	-	10	7.78	-	-
<i>Pleuronichthys verticalis</i>	4	3.45	2	1.74	-	-
<i>Atherinopsis californiensis</i>	15	17.97	-	-	-	-
<i>Umbriina roncador</i>	-	-	-	-	-	-
<i>Pleuronichthys ritteri</i>	1	1.34	1	0.74	-	-
<i>Xystreurus liolepis</i>	-	-	-	-	1	0.75
<i>Hypsopsetta guttulata</i>	1	1.20	-	-	-	-
<i>Rimicola</i> spp.	-	-	-	-	-	-
<i>Peprius simillimus</i>	-	-	3	2.33	-	-
<i>Cheilotrema saturnum</i>	-	-	-	-	-	-
<i>Semicossyphus pulcher</i>	-	-	-	-	1	0.75
<i>Ophidion scrippsae</i>	-	-	-	-	-	-
<i>Diaphus theta</i>	-	-	13	10.38	4	2.94
<i>Acanthogobius flavimanus</i>	3	2.58	-	-	-	-
<i>Pleuronichthys</i> spp.	-	-	1	0.74	1	0.75
Pleuronectiformes unid.	-	-	3	1.94	2	2.42
<i>Menticirrhus undulatus</i>	-	-	-	-	-	-
<i>Atractoscion nobilis</i>	-	-	2	1.91	-	-
Ophidiidae unid.	-	-	-	-	-	-
<i>Sebastes</i> spp.	-	-	1	0.77	1	0.75
<i>Girella nigricans</i>	-	-	-	-	-	-
<i>Typhlogobius californiensis</i>	2	1.94	2	2.17	3	2.30
<i>Citharichthys sordidus</i>	-	-	2	1.29	-	-
Pleuronectidae unid.	1	0.93	13	10.21	-	-
<i>Trachurus symmetricus</i>	-	-	2	1.38	-	-
<i>Halichoeres semicinctus</i>	-	-	-	-	-	-
<i>Syngnathus</i> spp.	-	-	-	-	-	-
Labridae	-	-	2	1.88	-	-

Table A3 (continued). Monthly abundance and mean concentration (#/1,000 m³) of larval fishes and target invertebrates at source water Stations N1-N5 in nearshore area.

Taxon	11 03/23/05 15		12 04/21/05 20		13 05/19/05 20	
	Count	Conc.	Count	Conc.	Count	Conc.
Fishes						
<i>Paraclinus integripinnis</i>	-	-	-	-	-	-
<i>Symphurus atricauda</i>	-	-	-	-	-	-
<i>Triphoturus mexicanus</i>	-	-	-	-	-	-
<i>Citharichthys</i> spp.	-	-	-	-	1	1.24
<i>Nannobranchium</i> spp.	-	-	1	0.65	1	0.75
<i>Medialuna californiensis</i>	-	-	-	-	-	-
<i>Gillichthys mirabilis</i>	-	-	-	-	-	-
<i>Chilara taylori</i>	-	-	-	-	-	-
<i>Heterostichus rostratus</i>	-	-	-	-	-	-
<i>Hypsoblennius jenkinsi</i>	-	-	-	-	-	-
Paralichthyidae unid.	-	-	-	-	-	-
Atherinopsidae	3	3.21	-	-	-	-
<i>Parophrys vetulus</i>	-	-	5	3.93	-	-
Myctophidae unid.	-	-	1	0.94	-	-
<i>Hippoglossina stomata</i>	-	-	-	-	-	-
<i>Zaniolepis frenata</i>	-	-	-	-	1	0.55
<i>Ruscaius creaseri</i>	2	2.15	-	-	-	-
Clupeiformes	-	-	-	-	-	-
<i>Syngnathus leptorhynchus</i>	-	-	-	-	-	-
Clupeidae unid.	-	-	-	-	-	-
<i>Lyopsetta exilis</i>	-	-	3	2.04	-	-
Pomacentridae	-	-	-	-	-	-
<i>Rhinogobiops nicholsi</i>	-	-	-	-	-	-
<i>Nannobranchium nitteri</i>	-	-	-	-	-	-
<i>Cyclothone</i> spp.	-	-	-	-	-	-
<i>Chromis punctipinnis</i>	-	-	-	-	-	-
<i>Icelinus</i> spp.	-	-	-	-	3	1.65
Gobiesocidae unid.	-	-	-	-	-	-
<i>Anisotremus davidsonii</i>	-	-	-	-	-	-
<i>Sebastes jordani</i>	-	-	-	-	-	-
Blennioidei	-	-	-	-	-	-
Clinidae unid.	-	-	-	-	-	-
Chaenopsidae unid.	-	-	-	-	-	-
<i>Leptocottus armatus</i>	-	-	-	-	-	-
Cynoglossidae	-	-	-	-	-	-
Kyphosidae	-	-	-	-	-	-
<i>Cyclothone acclinidens</i>	-	-	-	-	-	-
<i>Ilypnus gilberti</i>	-	-	-	-	-	-
<i>Gobiesox</i> spp.	-	-	-	-	1	0.75
Hexagrammidae unid.	-	-	-	-	-	-
<i>Bathylagus ochotensis</i>	-	-	1	0.75	-	-
<i>Hypsoblennius gentilis</i>	-	-	-	-	-	-
Invertebrates						
<i>Panulirus interruptus</i>	-	-	-	-	-	-
<i>Cancer anthonyi</i> (megalops)	-	-	-	-	1	0.77
<i>Cancer antennarius</i> (megalops)	-	-	-	-	6	4.99
<i>Cancer gracilis</i> (megalops)	-	-	-	-	2	1.10
<i>Cancer</i> spp. (megalops)	-	-	-	-	-	-
<i>Cancer productus</i> (megalops)	-	-	-	-	2	1.54
	41,868		42,167		38,953	