

FISHERIES INVENTORY AND UTILIZATION
OF SAN DIEGO BAY, SAN DIEGO, CALIFORNIA
FOR SURVEYS CONDUCTED IN JUNE 2009

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Executive Summary

The Vantuna Research Group at Occidental College surveyed the estuarine fishes of San Diego Bay in June 2009 for the Port of San Diego. The survey followed a subset of the protocols established from July 1994 to April 1999 (Allen 1999, Allen et al. 2002, Pondella et al. 2006, Pondella and Williams 2009). The goal of the current study was to determine the abundance and size class structure of avian forage species in San Diego Bay at all four bay ecoregions during the critical timing of the least tern breeding season.

During this study, 5,208 (27 species) fishes weighing 57 kg were collected. The most numerous species comprising 75% of the catch was slough anchovy (*Anchoa delicatissima*), followed by shiner perch (*Cymatogaster aggregata*), dwarf surfperch (*Micrometrus minimus*), round stingray (*Urobatis halleri*), topsmelt (*Atherinops affinis*) and giant kelpfish (*Heterostichus rostratus*). In terms of biomass, spotted sand bass (*Paralabrax maculatofasciatus*) dominated the catch comprising 21.1% of the biomass. In addition, round stingrays, slough anchovies and yellowfin croaker (*Umbrina roncadore*) represented the greatest biomass for fishes. Total catch was greatest at the North-Central Ecoregion, followed by the North Ecoregion, South-Central Ecoregion and South Ecoregion.

In this preliminary assessment we found avian forage species (slough anchovy, shiner perch, giant kelpfish, and arrow goby) in all appropriate size classes for foraging terns. Size classes of forage fishes started at the 5-10 mm SL size range, with these fishes being found in all size ranges from 10-100 mm SL.

Field Surveys

We sampled the following locations in the North, North-Central, South-Central, and South ecoregions (Figure 1, Table 1) with replicated purse seines and square enclosures.

Figure 1. Sampling locations of the North (1), North-Central (2), South-Central (3) and South (4) Ecoregions in San Diego Bay.

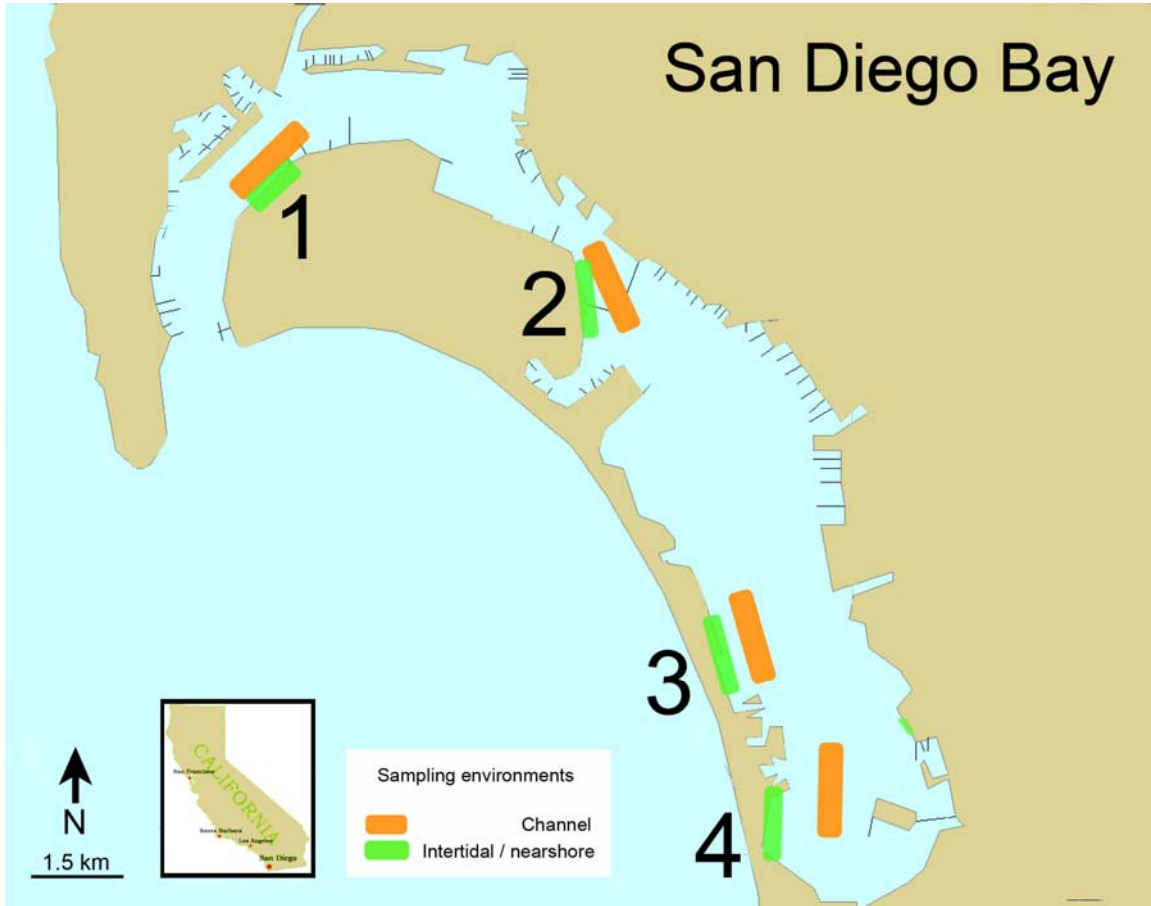


Table 1. Lambert Coordinates (LAT, LONG) for San Diego Bay Fisheries Inventory and Utilization study, 2008.

Ecoregion	Site	Latitude	Longitude
North	Vegetated	32° 41' 50"	117° 13' 40"
	Non-Vegetated	32° 42' 45"	117° 12' 30"
North-Central	Vegetated	32° 41' 25"	117° 09' 50"
	Non-Vegetated	32° 41' 12"	117° 09' 45"
South-Central	Vegetated	32° 39' 05"	117° 08' 30"
	Non-Vegetated	32° 38' 48"	117° 08' 25"
South	Vegetated	32° 37' 00"	117° 07' 45"
	Non-Vegetated	32° 36' 50"	117° 06' 45"

Sampling Procedures

Sampling occurred on June 8, 2009 (Ecoregion 3 – South-Central), June 9, 2009 (Ecoregion 4 – South), June 10, 2009 (Ecoregion 2 – North-Central) and June 11, 2009 (Ecoregion 1 – North). One Ecoregion was sampled per day. Collections were made off the 5-m *R/V Blennius* and the 6-m *R/V Larvae*. At each Ecoregion, the following five subhabitats were sampled: deep channel, nearshore non-vegetated, nearshore vegetated, intertidal non-vegetated, and intertidal vegetated.

Fish were sampled at each Ecoregion using the following gear:

- 1) A 1 m² square enclosure constructed of 2.5 cm metal pipe and canvas was used to survey small, burrow-inhabiting fish in shallow intertidal areas of the bay. The enclosure was randomly set within each subhabitat in a depth of 0.25-0.75 m. One liter of 9:1 isoproponal-2-quinoline solution was added to the enclosed water and then searched for 10 minutes using a 1 mm mesh dipnet.
- 2) A 66 X 6 m purse seine (1.2 cm mesh wings and 0.6 cm mesh bag) was used to sample fish species in the nearshore and channel subhabitats. The purse seine was randomly set within each subhabitat and sampled a total area of approximately 296 m² per replicate. Three replicates per subhabitat were conducted during each sampling period.

All fishes or subsamples of large catches were measured to the nearest 1 mm (Standard Length or Disk Width) and weighed with a Pesola hanging scale in the field. Lambert coordinates of each sampling effort were recorded for all sampling events. The station events are plotted in Figures 2-5.

Figure 2. Sampling events for the North Ecoregion.



Figure 3. Sampling events for the North-Central Ecoregion.

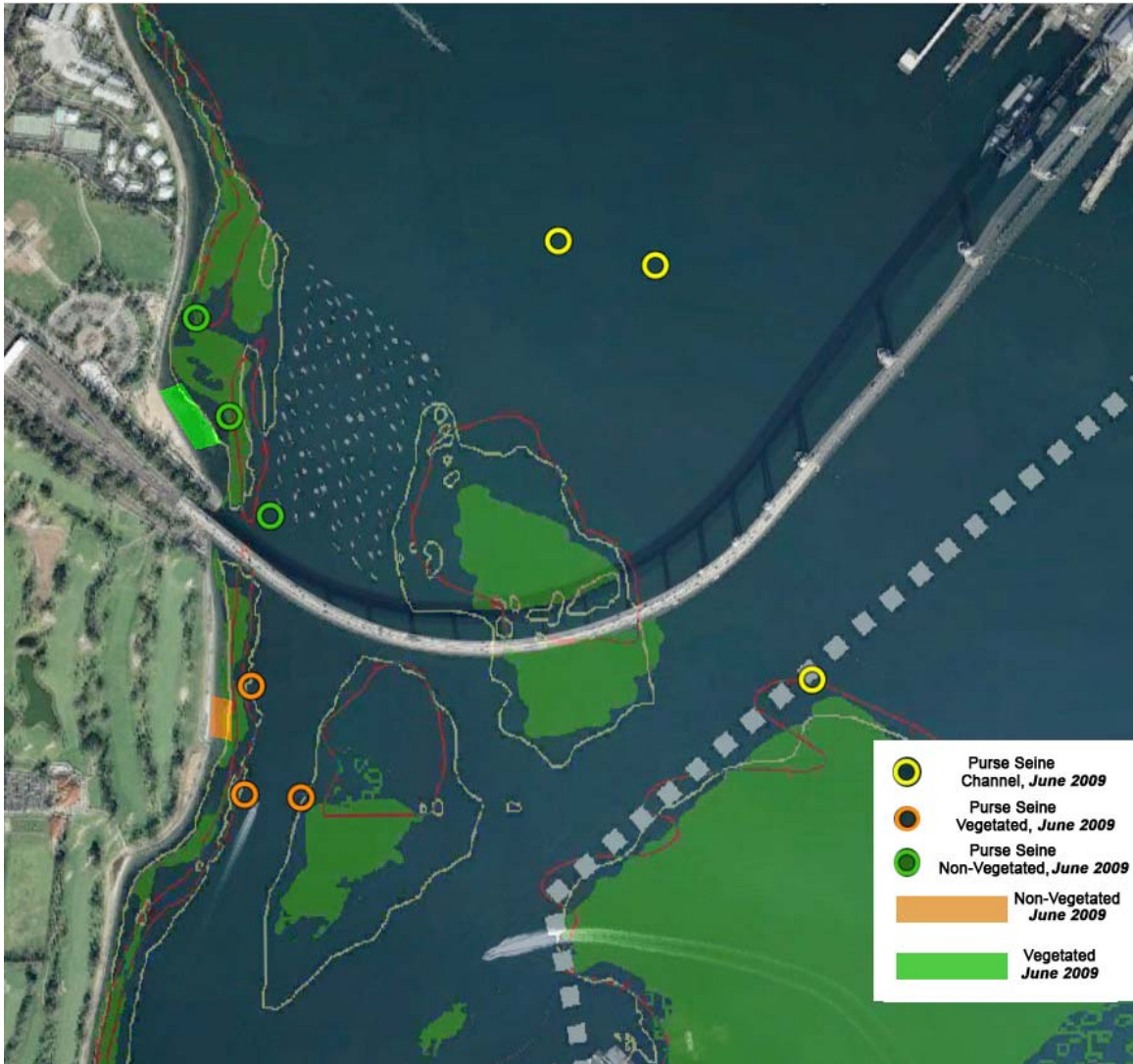
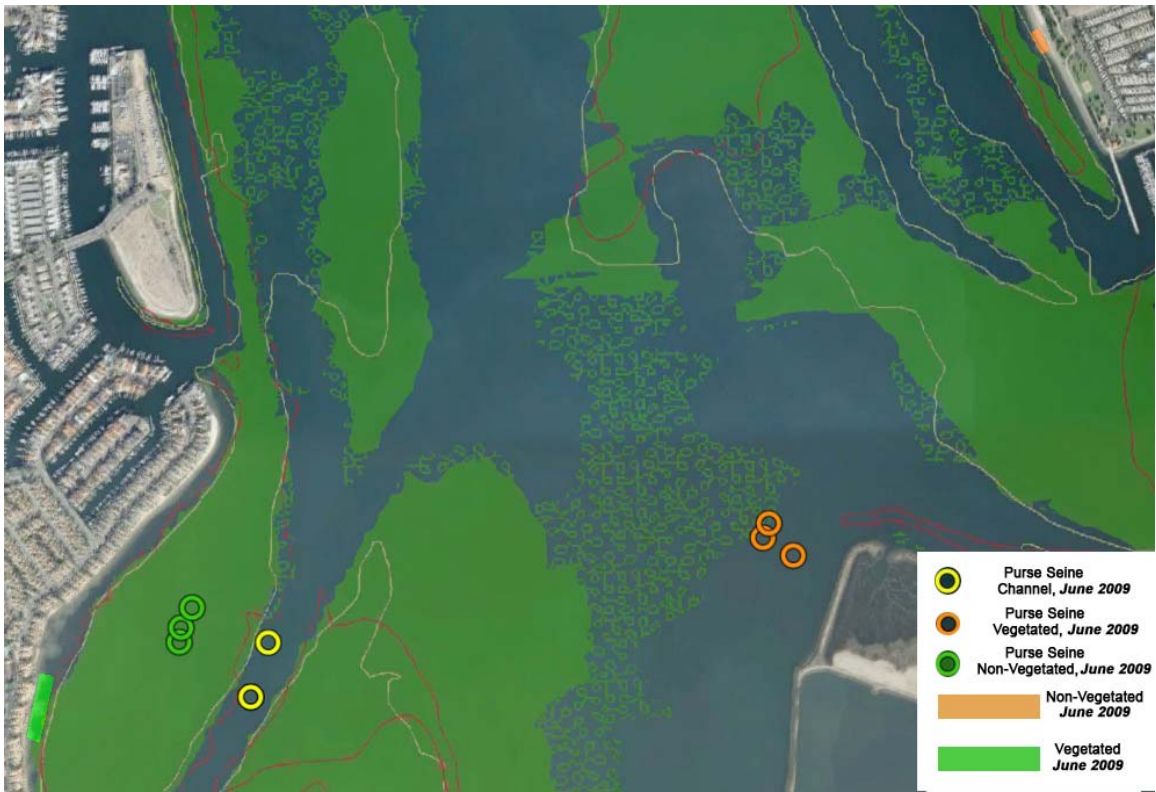


Figure 4. Sampling events for the South-Central Ecoregion.



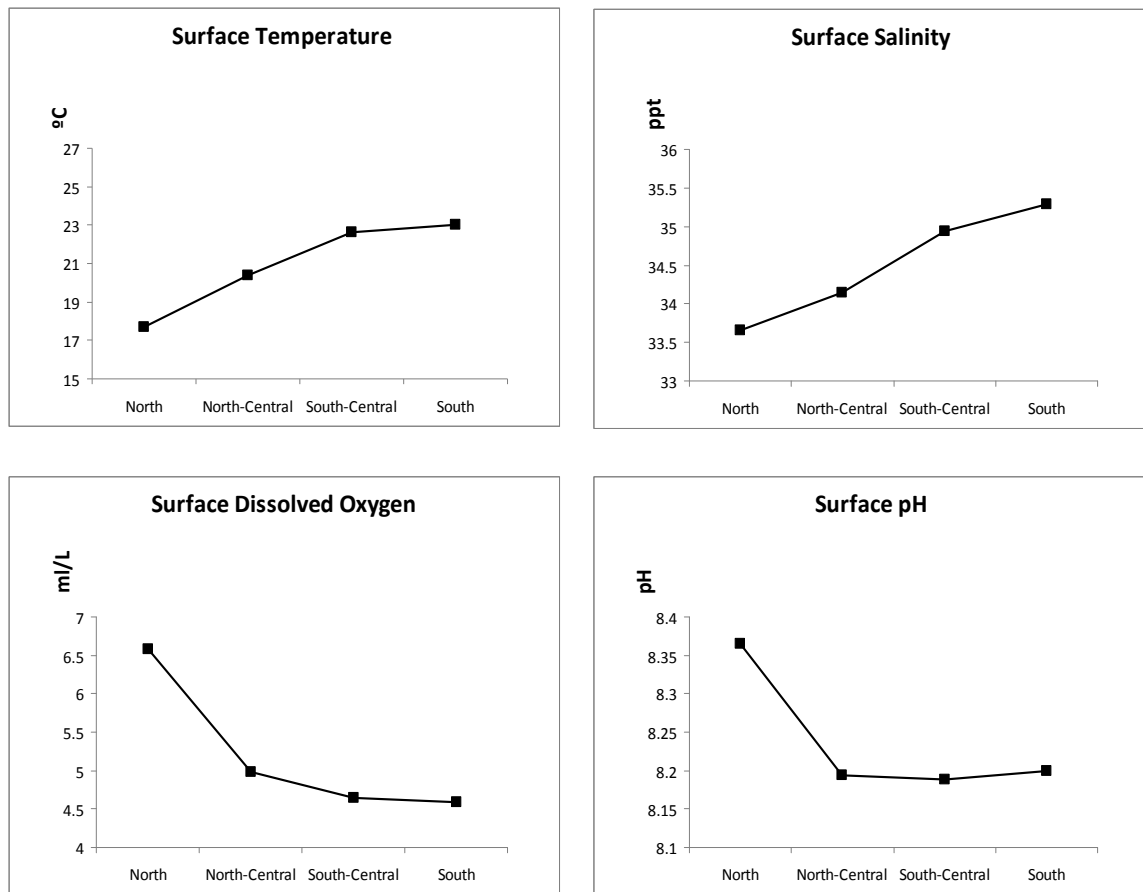
Figure 5. Sampling events for the South Ecoregion.



Water Quality Parameters

Water temperature ($^{\circ}\text{C}$), salinity (ppt), dissolved oxygen (mgO_2/l), and pH was measured at each Ecoregion. Data entry, summarization, graphing, and descriptive analyses were accomplished using *Microsoft Excel* for Windows. *Microsoft Excel* was also used to tabulate the physical and chemical parameters of each Ecoregion sampled by the Sea-Bird oceanographic profiler. Temperature and salinity increased from north to south in the bay during the sampling period. Dissolved oxygen and pH generally decreased from north to south with most of the decrease observed between the North and North-Central Ecoregions (Figure 6).

Figure 6. Summary of mean physical-chemical measurements by Ecoregion among ecoregions, June 2009.

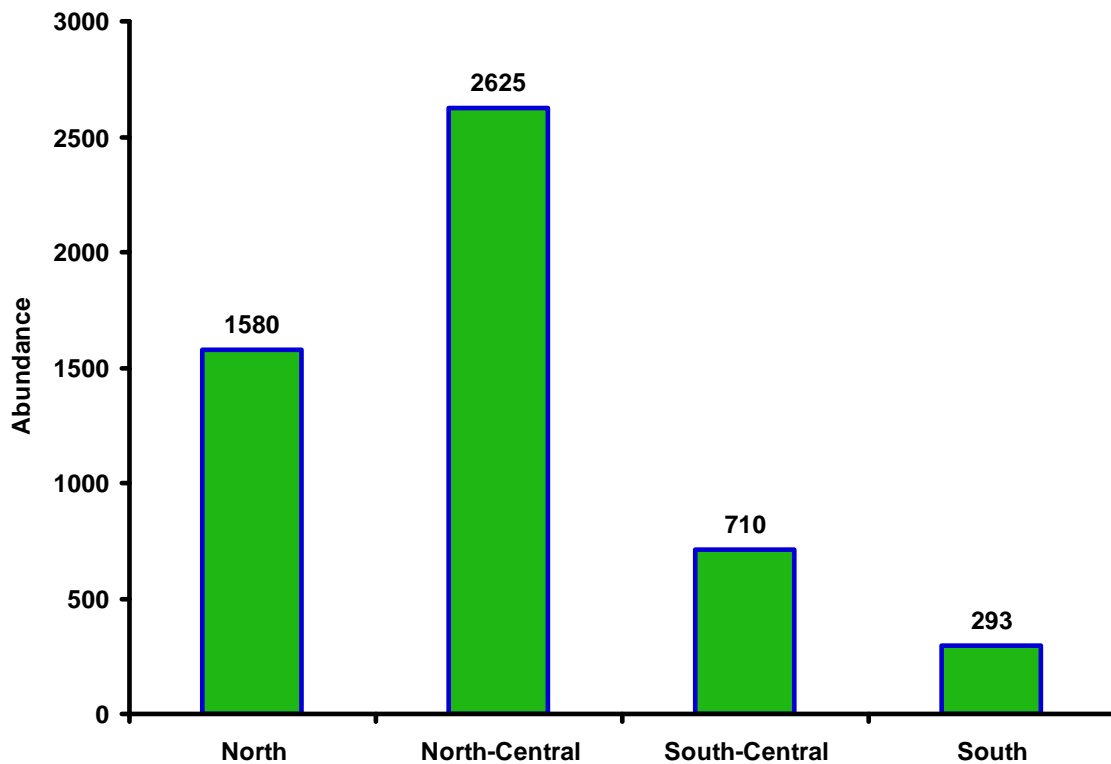


Numerical Catch and Biomass

During this study, 5,208 (27 species) fishes weighing 57 kg were collected (Tables 2 and 3). The most numerous species comprising 75% of the catch was slough anchovy (*Anchoa delicatissima*), followed by shiner perch (*Cymatogaster aggregata*; 14%), dwarf surfperch (*Micrometrus minimus*; 2.7%), round stingray (*Urobatis halleri*; 1.7%), topsmelt (*Atherinops affinis*; 1.3%) and giant kelpfish (*Heterostichus rostratus*; 1.3%) . In terms of biomass, spotted sand bass (*Paralabrax maculatofasciatus*) dominated the catch comprising 21.1% of the biomass. In addition, round stingrays (20.2%), slough anchovies (18.9%) and yellowfin croaker (*Umbrina roncadore*) (10.1%) represented the greatest biomass for fishes.

Total catch was greatest at the North-Central Ecoregion (2,625; Table 5), followed by the North Ecoregion (1580; Table 4), South-Central Ecoregion (710; Table 6), and South Ecoregion (293; Table 7) (Figure 7).

Figure 7. Catch of San Diego Bay fishes by Ecoregion, June 2009.



Overall the catch of the five numerically dominant fishes were generally greater towards the mouth of the bay with most of the variation explained by the catch of slough anchovies (Figure 8).

Figure 8. Total catch of the five numerically dominant species by Ecoregion.

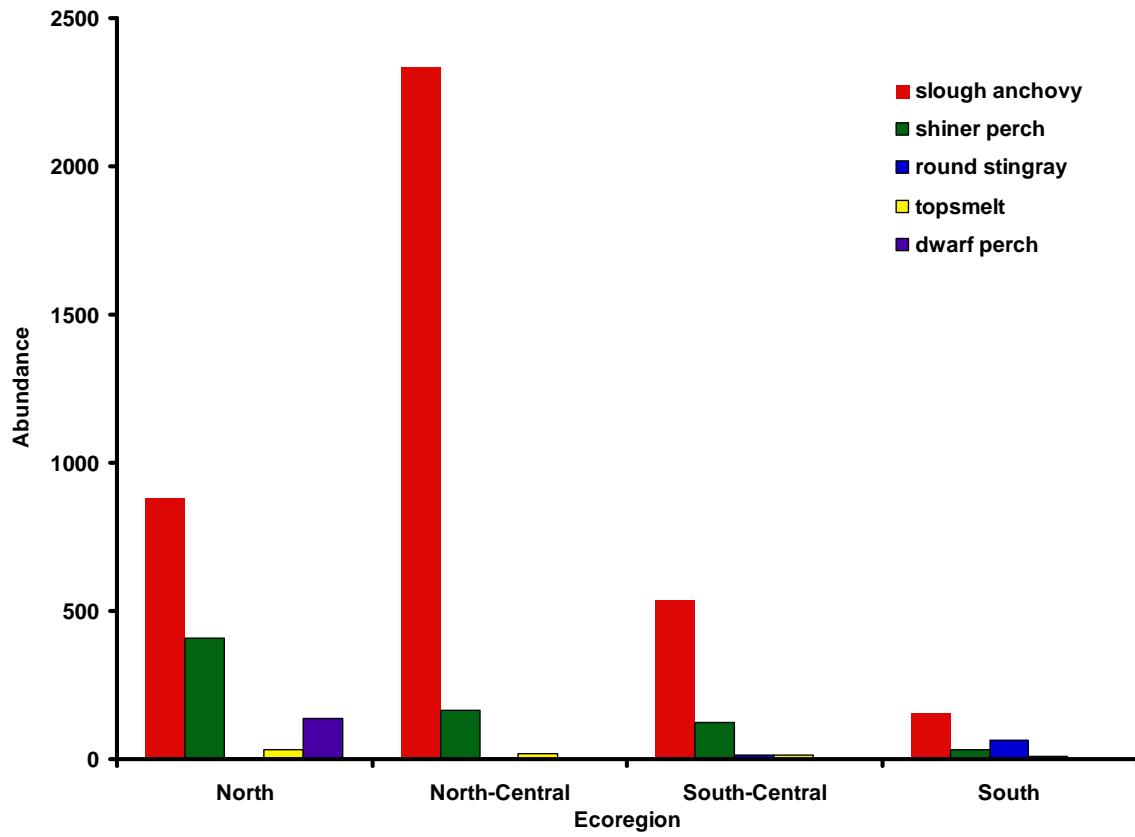


Table 2. Total abundance of fishes collected in San Diego Bay during June 2009 by Ecoregion.

SCIENTIFIC NAME	COMMON NAME	ECOREGIONS				TOTAL	%
		North	North-Central	South-Central	South		
<i>Acanthogobius flavimanus</i>	yellowfin goby			1		1	0.02
<i>Albula vulpes</i>	bonefish				1	1	0.02
<i>Anchoa compressa</i>	deepbody anchovy				13	13	0.25
<i>Anchoa delicatissima</i>	slough anchovy	883	2335	537	154	3909	75.06
<i>Atherinops affinis</i>	topsmelt	30	17	12	10	69	1.32
<i>Clevelandia ios</i>	arrow goby	19	7	7	3	36	0.69
<i>Cymatogaster aggregata</i>	shiner perch	409	166	122	32	729	14.00
<i>Cynoscion parvipinnis</i>	shortfin corvina				1	1	0.02
<i>Embiotoca jacksoni</i>	black perch	25	1			26	0.50
<i>Girella nigricans</i>	opaleye	3				3	0.06
<i>Gymnura marmorata</i>	California butterfly ray				1	1	0.02
<i>Halichoeres semicinctus</i>	rock wrasse	1				1	0.02
<i>Heterodontus francisci</i>	horn shark	2				2	0.04
<i>Heterostichus rostratus</i>	giant kelpfish	34	29	3	1	67	1.29
<i>Micrometrus minimus</i>	dwarf surfperch	139				139	2.67
<i>Myliobatis californica</i>	bat ray		1			1	0.02
<i>Paralabrax clathratus</i>	kelp bass	23	5			28	0.54
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	3	28	13	12	56	1.08
<i>Paralabrax nebulifer</i>	barred sand bass	1	1			2	0.04
<i>Phanerodon furcatus</i>	white seaperch	1				1	0.02
<i>Pleuronichthys guttulatus</i>	diamond turbot	1				1	0.02
<i>Scorpaena guttata</i>	California scorpionfish		1			1	0.02
<i>Syngnathus leptorhynchus</i>	bay pipefish	1			1	2	0.04
<i>Synodus lucioceps</i>	California lizardfish		2			2	0.04
<i>Umbrina roncadore</i>	yellowfin croaker		16			16	0.31
<i>Urobatis halleri</i>	round stingray	5	6	15	64	90	1.73
<i>Xenistius californiensis</i>	salema		10			10	0.19
Number of Species = 27		1,580	2,625	710	293	5,208	

Table 3. Total biomass of fishes collected in San Diego Bay during June 2009 by Ecoregion.

SCIENTIFIC NAME	COMMON NAME	ECOREGIONS				TOTAL	%
		North	North-Central	South-Central	South		
<i>Acanthogobius flavimanus</i>	yellowfin goby			11		11	0.02
<i>Albula vulpes</i>	bonefish				565	565	0.99
<i>Anchoa compressa</i>	deepbody anchovy				218	218	0.38
<i>Anchoa delicatissima</i>	slough anchovy	2965	5938	1252	632	10787	18.90
<i>Atherinops affinis</i>	topsmelt	361	170	105	202	838	1.47
<i>Clevelandia ios</i>	arrow goby	0.968	0.542	0.448	0.247	2.205	0.00
<i>Cymatogaster aggregata</i>	shiner surfperch	1655	457	571	192	2875	5.04
<i>Cynoscion parvipinnis</i>	shortfin corvina				180	180	0.32
<i>Embiotoca jacksoni</i>	black surfperch	3195	26			3221	5.64
<i>Girella nigricans</i>	opaleye	1270				1270	2.23
<i>Gymnura marmorata</i>	California butterfly ray				530	530	0.93
<i>Halichoeres semicinctus</i>	rock wrasse	12				12	0.02
<i>Heterodontus francisci</i>	horn shark	1680				1680	2.94
<i>Heterostichus rostratus</i>	giant kelpfish	408	170	18	10	606	1.06
<i>Hypsopsetta guttulata</i>	diamond turbot	35				35	0.06
<i>Micrometrus minimus</i>	dwarf surfperch	277				277	0.49
<i>Myliobatis californica</i>	bat ray		2600			2600	4.56
<i>Paralabrax clathratus</i>	kelp bass	591	128			719	1.26
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	750	7431	1835	2051	12067	21.14
<i>Paralabrax nebulifer</i>	barred sand bass	800	14			814	1.43
<i>Phanerodon furcatus</i>	white seaperch	11				11	0.02
<i>Scorpaena guttata</i>	California scorpionfish		26			26	0.05
<i>Sygnathus leptorhynchus</i>	bay pipefish	2			2	4	0.01
<i>Synodus lucioceps</i>	California lizardfish		300			300	0.53
<i>Umbrina roncador</i>	yellowfin croaker		5780			5780	10.13
<i>Urobatis halleri</i>	round stingray	940	1440	1410	7750	11540	20.22
<i>Xenistius californiensis</i>	salema		109			109	0.19
Number of Species = 27		14,953	24,590	5,202	12,332	57,077	

Catch by Ecoregion

North (Ecoregion 1) – A total of 1,580 fishes belonging to 17 species, weighing 15 kg were collected in the North Ecoregion (Table 4). Slough anchovy was the most abundant species (55.9%), followed by shiner surfperch (25.9%) and dwarf surfperch. Black perch led in total biomass (21.4%), followed by slough anchovy (19.8%), horn sharks (11.2 %) and shiner surfperch (11.1%).

Table 4. Total number of individuals and biomass (g) of fish species captured June 2009 in the North Ecoregion.

SCIENTIFIC NAME	COMMON NAME	TOTAL #	%	TOTAL MASS	
				(g)	%
<i>Anchoa delicatissima</i>	slough anchovy	883	55.89	2965	19.83
<i>Atherinops affinis</i>	topsmelt	30	1.90	361	2.41
<i>Clevelandia ios</i>	arrow goby	19	1.20	1	0.01
<i>Cymatogaster aggregata</i>	shiner perch	409	25.89	1655	11.07
<i>Embiotoca jacksoni</i>	black perch	25	1.58	3195	21.37
<i>Girella nigricans</i>	opaleye	3	0.19	1270	8.49
<i>Halichoeres semicinctus</i>	rock wrasse	1	0.06	12	0.08
<i>Heterodontus francisci</i>	horn shark	2	0.13	1680	11.24
<i>Heterostichus rostratus</i>	giant kelpfish	34	2.15	408	2.73
<i>Micrometrus minimus</i>	dwarf surfperch	139	8.80	277	1.85
<i>Paralabrax clathratus</i>	kelp bass	23	1.46	591	3.95
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	3	0.19	750	5.02
<i>Paralabrax nebulifer</i>	barred sand bass	1	0.06	800	5.35
<i>Phanerodon furcatus</i>	white seaperch	1	0.06	11	0.07
<i>Pleuronichthys guttulatus</i>	diamond turbot	1	0.06	35	0.23
<i>Syngnathus leptorhynchus</i>	bay pipefish	1	0.06	2	0.01
<i>Urobatis halleri</i>	round stingray	5	0.32	940	6.29
Number of Species = 17		1,580		14,953	

North-Central (Ecoregion 2) - A total of 2,625 fishes belonging to 15 species, weighing 24.6 kg were collected in the North-Central Ecoregion (Table 5). Slough anchovy was the most abundant species (89%), followed by shiner perch (6.3%). Spotted sand bass led in total biomass (30.2%), followed by slough anchovy (24.2%) and yellowfin croaker (23.5%).

Table 5. Total number of individuals and biomass (g) of fish species captured in the North-Central Ecoregion, June 2009.

SCIENTIFIC NAME	COMMON NAME	TOTAL #	%	TOTAL MASS	
				(g)	%
<i>Anchoa delicatissima</i>	slough anchovy	2335	88.95	5938	24.15
<i>Atherinops affinis</i>	topsmelt	17	0.65	170	0.69
<i>Clevelandia ios</i>	arrow goby	7	0.27	1	<0.01
<i>Cymatogaster aggregata</i>	shiner perch	166	6.32	457	1.86
<i>Embiotoca jacksoni</i>	black perch	1	0.04	26	0.11
<i>Heterostichus rostratus</i>	giant kelpfish	29	1.10	170	0.69
<i>Myliobatis californica</i>	bat ray	1	0.04	2600	10.57
<i>Paralabrax clathratus</i>	kelp bass	5	0.19	128	0.52
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	28	1.07	7431	30.22
<i>Paralabrax nebulifer</i>	barred sand bass	1	0.04	14	0.06
<i>Scorpaena guttata</i>	California scorpionfish	1	0.04	26	0.11
<i>Synodus lucioceps</i>	California lizardfish	2	0.08	300	1.22
<i>Umbrina roncadore</i>	yellowfin croaker	16	0.61	5780	23.51
<i>Urobatis halleri</i>	round stingray	6	0.23	1440	5.86
<i>Xenistius californiensis</i>	salema	10	0.38	109	0.44
Number of Species = 15		2,625		24,590	

South-Central (Ecoregion 3) - A total of 710 fishes belonging to 8 species, weighing 5.2 kg were collected in the South-Central Ecoregion (Table 6). Slough anchovy (75.6%) and shiner surfperch (17.2%) dominated the catch. For biomass, spotted sand bass ranked the highest (35.3%), round stingray (27.1%) and slough anchovy (24.1%).

Table 6. Total number of individuals and biomass (g) of fish species captured in the South-Central Ecoregion, June 2009.

SCIENTIFIC NAME	COMMON NAME	TOTAL #	%	TOTAL MASS	
				(g)	%
<i>Acanthogobius flavimanus</i>	yellowfin goby	1	0.14	11	0.21
<i>Anchoa delicatissima</i>	slough anchovy	537	75.63	1252	24.07
<i>Atherinops affinis</i>	topsmelt	12	1.69	105	2.02
<i>Clevelandia ios</i>	arrow goby	7	0.99	0.5	0.01
<i>Cymatogaster aggregata</i>	shiner perch	122	17.18	571	10.98
<i>Heterostichus rostratus</i>	giant kelpfish	3	0.42	18	0.35
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	13	1.83	1835	35.27
<i>Urobatis halleri</i>	round stingray	15	2.11	1410	27.10
Number of Species = 8		710		5,203	

South (Ecoregion 4) - A total of 293 fishes belonging to 12 species, weighing 12.3 kg were collected in the South Ecoregion (Table 7). Slough anchovy was the most abundant species (52.6%), followed by round stingray (21.8%) and shiner surfperch (10.9%). Round stingray led in total biomass (62.8%) followed by spotted sand bass (16.6%).

Table 7. Total number of individuals and biomass (g) of fish species captured in the South Ecoregion, June 2009.

SCIENTIFIC NAME	COMMON NAME	TOTAL #	%	TOTAL MASS	
				(g)	%
<i>Albula vulpes</i>	bonefish	1	0.34	565	4.58
<i>Anchoa compressa</i>	deepbody anchovy	13	4.44	218	1.77
<i>Anchoa delicatissima</i>	slough anchovy	154	52.56	632	5.12
<i>Atherinops affinis</i>	topsmelt	10	3.41	202	1.64
<i>Clevelandia ios</i>	arrow goby	3	1.02	0.25	<0.01
<i>Cymatogaster aggregata</i>	shiner perch	32	10.92	192	1.56
<i>Cynoscion parvipinnis</i>	shortfin corvina	1	0.34	180	1.46
<i>Gymnura marmorata</i>	butterfly ray	1	0.34	530	4.30
<i>Heterostichus rostratus</i>	giant kelpfish	1	0.34	10	0.08
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	12	4.10	2051	16.63
<i>Syngnathus leptorhynchus</i>	bay pipefish	1	0.34	2	0.02
<i>Urobatis halleri</i>	round stingray	64	21.84	7750	62.84
Number of Species = 12		293		12,332	

Nursery Area Function

Of the top 18 species, 15.5% were juveniles. Typically we report a much higher percentage of juvenile species. These relative percentage is consistent with our previous surveys due to the large number of slough anchovies, which were above the juvenile/adult cutoff skewing the results. It is also not appropriate to make a direct comparison of this percentage with previous surveys due to the missing sampling methods.

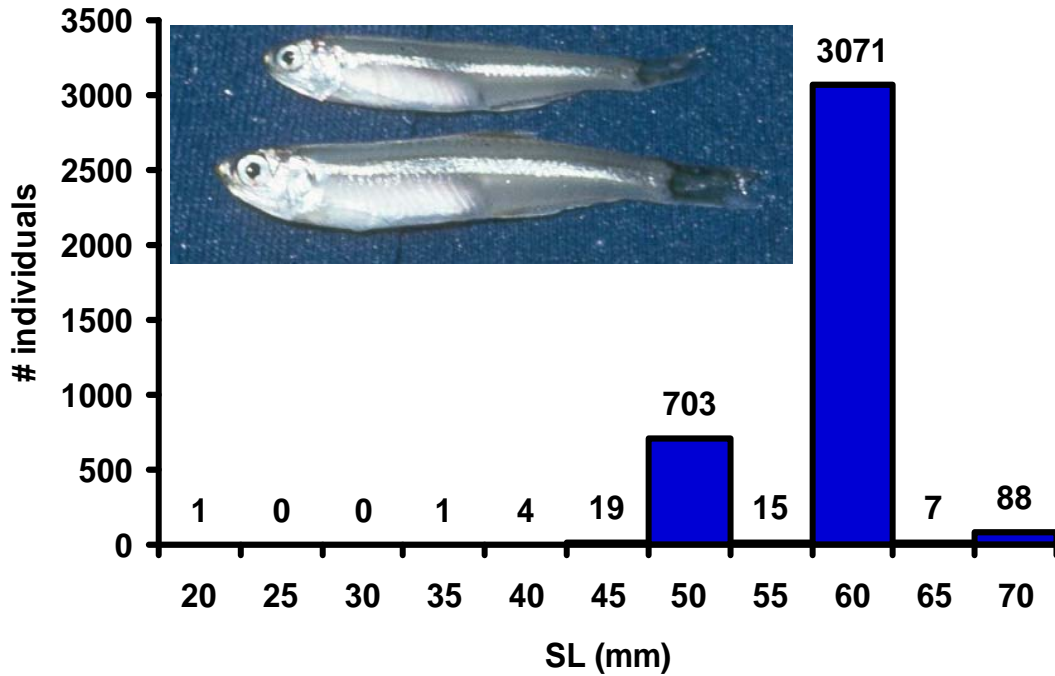
Table 8. Percent of juveniles taken of the top 18 species of fish from San Diego Bay.

SCIENTIFIC NAME	COMMON NAME	% JUVENILES
<i>Halichoeres semicinctus</i>	rock wrasse	100.0
<i>Heterodontus francisci</i>	horn shark	100.0
<i>Scorpaena guttata</i>	California scorpionfish	100.0
<i>Xenistius californiensis</i>	salema	100.0
<i>Paralabrax clathratus</i>	kelp bass	96.4
<i>Heterostichus rostratus</i>	giant kelpfish	95.5
<i>Clevelandia ios</i>	arrow goby	91.7
<i>Urobatis halleri</i>	round stingray	86.7
<i>Micrometrus minimus</i>	dwarf perch	86.3
<i>Atherinops affinis</i>	topsmelt	78.3
<i>Paralabrax nebulifer</i>	barred sand bass	50.0
<i>Syngnathus leptorhynchus</i>	bay pipefish	50.0
<i>Cymatogaster aggregata</i>	shiner perch	49.8
<i>Embiotoca jacksoni</i>	black perch	46.2
<i>Umbrina roncador</i>	yellowfin croaker	31.3
<i>Paralabrax maculatofasciatus</i>	spotted sand bass	10.7
<i>Anchoa compressa</i>	slough anchovy	7.7
<i>Anchoa delicatissima</i>	deepbody anchovy	0.7
	TOTAL	15.5

Principle Avian Forage Species

Slough anchovy (*Anchoa delicatissima*) – This species comprised 75% of the catch. All of the slough anchovies were found in the 20 - 70 mm SL size classes, with most in the 50 and 60 mm SL bins (Figure 14).

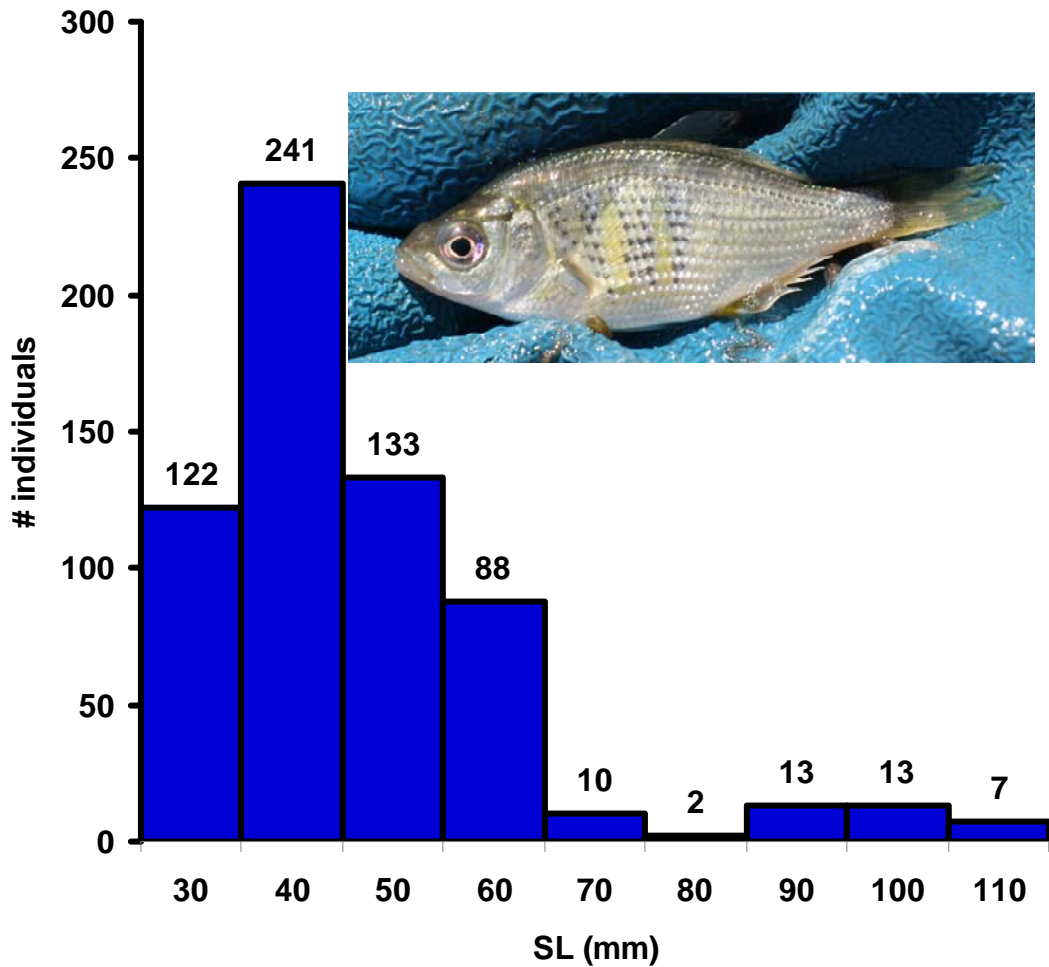
Figure 9. Standard length (SL) versus total catch (# individuals) of slough anchovy.



Shiner perch (*Cymatogaster aggregata*)

Shiner perch were the second most abundant fish captured. Adult shiner perch, which live offshore, are known to utilize the bay for reproduction. Thus the bimodal distribution (Figure 18) is an indication of this life history pattern. Some larger individuals were present, but the bulk of the stock was young fishes who were typically associated with eelgrass beds. Most of the shiners were in the 30-60 mm SL size range.

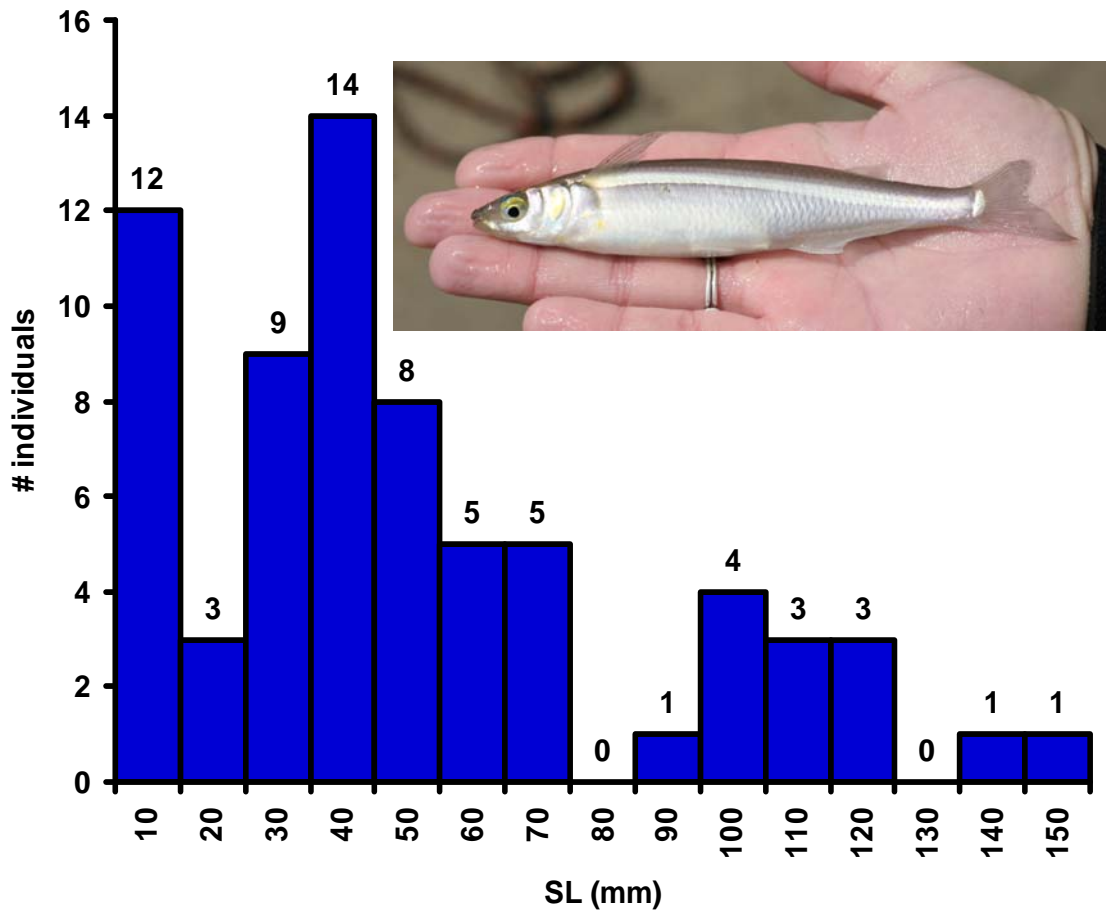
Figure 10. Standard length (SL) versus total catch (# individuals) of shiner perch.



Topsmelt (*Atherinops affinis*)

Topsmelt was the fourth most abundant fish in this survey. However, we typically catch the most topsmelt in the beach seines, not the square enclosures or purse seines. They were the second most predominant forage fish in the bay in 2008. The catch of topsmelt was skewed toward the smallest size classes (Figure 17).

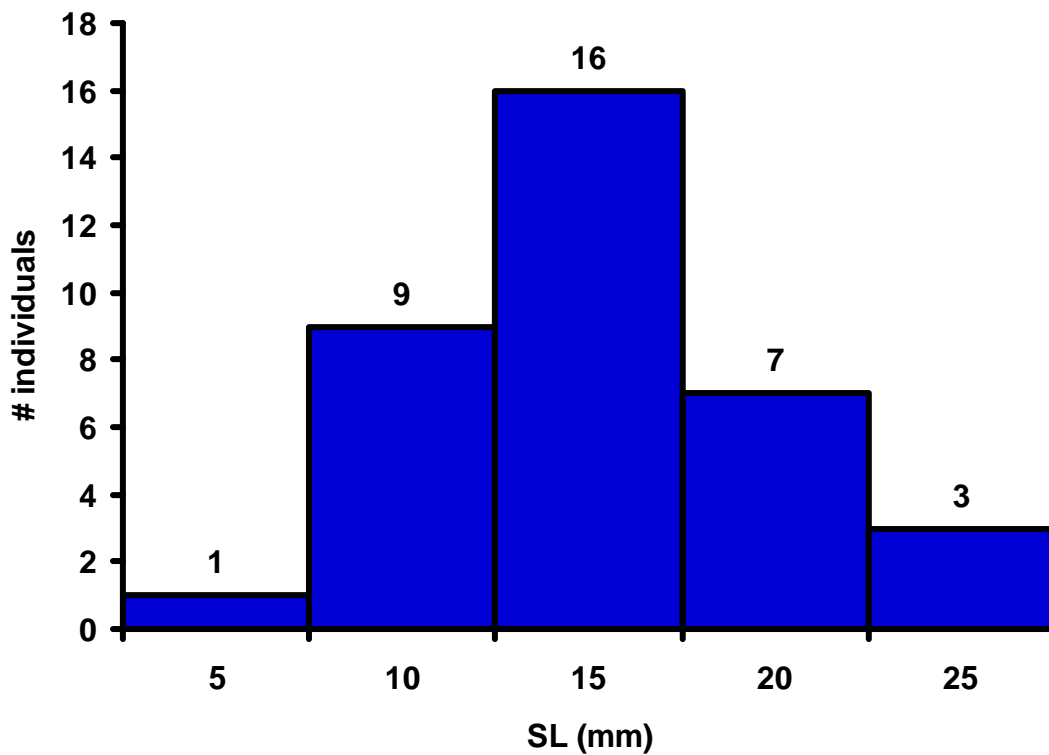
Figure 11. Standard length (SL) versus total catch (# individuals) of topsmelt.



Arrow goby (*Clevelandia ios*)

Arrow gobies were the primary catch in the meter cube sampler. Thus while there relative abundance was low, this is a result of the small amount of surface area sampled. All the arrow gobies were in the 5 – 25 mm size range (Figure 19). Arrow gobies were caught in each ecoregion.

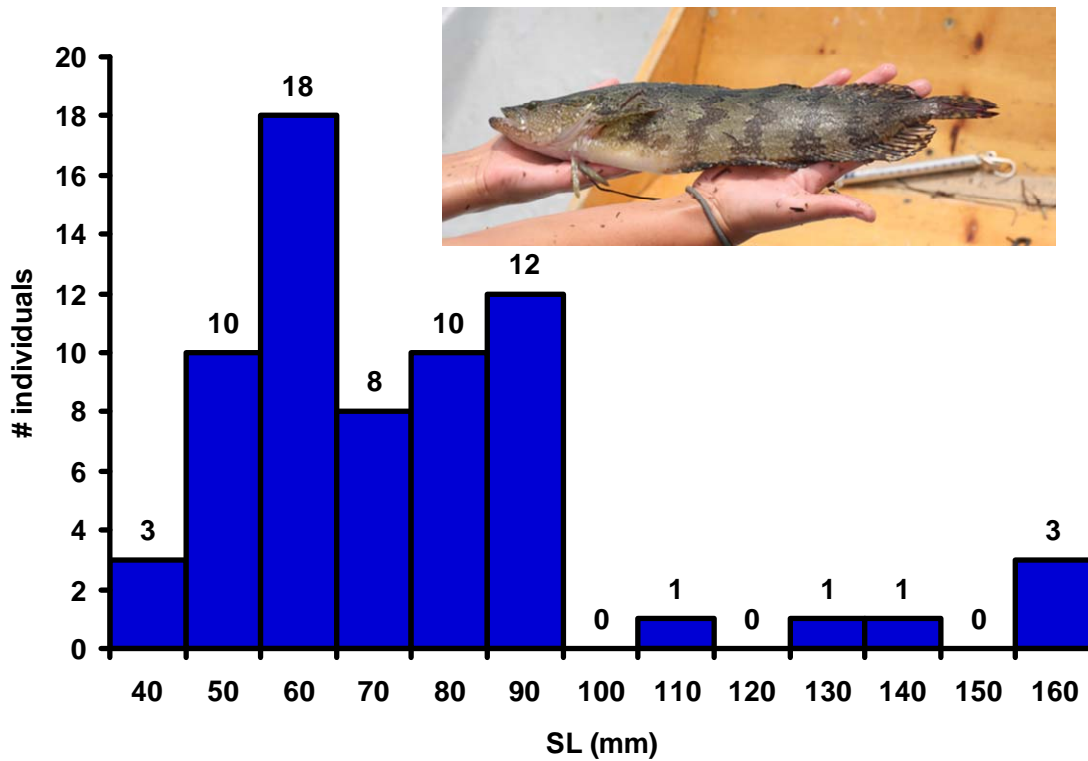
Figure 12. Standard length (SL) versus total catch (# individuals) of arrow goby.



Giant kelpfish (*Heterostichus rostratus*)

Giant kelpfish were caught primarily as juveniles in the north and north-central ecoregions, but were present in all ecoregions. They were the fifth most abundant species caught. Typically we catch most of the giant kelpfish juveniles in the eelgrass with the beam trawl.

Figure 13. Standard length (SL) versus total catch (# individuals) of giant kelpfish.



Catch by Sampling Method

All of the arrow gobies and the yellowfin goby were caught in the meter cube. Everything else was captured in the purse seine (Tables 14 and 15).

Table 9. Total catch of fish species taken in San Diego Bay, June 2009 by sampling method (gear).

PURSE SEINE			SQUARE ENCLOSURE		
COMMON NAME	ABUNDANCE	%	COMMON NAME	ABUNDANCE	%
slough anchovy	3909	75.59	arrow goby	36	97.3
shiner perch	729	14.10	yellowfin goby	1	2.703
dwarf perch	139	2.69			
round stingray	90	1.74			
topsmelt	69	1.33			
giant kelpfish	67	1.30			
spotted sand bass	56	1.08			
kelp bass	28	0.54			
black perch	26	0.50			
yellowfin croaker	16	0.31			
deepbody anchovy	13	0.25			
salema	10	0.19			
opaleye	3	0.06			
horn shark	2	0.04			
barred sand bass	2	0.04			
bay pipefish	2	0.04			
California lizardfish	2	0.04			
bonefish	1	0.02			
shortfin corvina	1	0.02			
California butterfly ray	1	0.02			
rock wrasse	1	0.02			
diamond turbot	1	0.02			
bat ray	1	0.02			
white seaperch	1	0.02			
California scorpionfish	1	0.02			
Total	5,171		Total	37	
Number of species	25		Number of species	2	

Table 10. Total biomass (g) of fish species taken from San Diego Bay, June 2009, ranked by sampling method.

PURSE SEINE			SQUARE ENCLOSURE		
COMMON NAME	MASS	%	COMMON NAME	MASS	%
spotted sand bass	12067	21.15	yellowfin goby	11	83.33
round stingray	11540	20.22	arrow goby	2.2	16.67
slough anchovy	10787	18.90			
yellowfin croaker	5780	10.13			
black perch	3221	5.64			
shiner perch	2875	5.04			
bat ray	2600	4.56			
horn shark	1680	2.94			
opaleye	1270	2.23			
topsmelt	838	1.47			
barred sand bass	814	1.43			
kelp bass	719	1.26			
giant kelpfish	606	1.06			
bonefish	565	0.99			
California butterfly ray	530	0.93			
California lizardfish	300	0.53			
dwarf perch	277	0.49			
deepbody anchovy	218	0.38			
shortfin corvina	180	0.32			
salema	109	0.19			
diamond turbot	35	0.06			
California scorpionfish	26	0.05			
rock wrasse	12	0.02			
white seaperch	11	0.02			
bay pipefish	4	0.01			
Total (g)	57,064		Total (g)	13	
Number of species	25		Number of species	2	

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