

**Cruise Report for the
Surface Waters Ambient Monitoring Program (SWAMP)
Bioaccumulation Screening Study
on
the Coast of California (FY 08-09)**

Sampling Dates: April 2008- November 2008

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Updated: 04/03/10**

1.0 Introduction

This report describes the first year sampling activities of a two year screening study of popular fish species caught along the California's coast, bays, and estuaries for bioaccumulation of contaminants in fish tissue. Fish were collected from designated zones with guidance from SWAMP Bioaccumulation Oversight Group (BOG). The State Water Quality Control Board (SWQCB) work was authorized via FY 08-09 in support of Work Order 08SWBG01. The work for the FY 08-09 SWAMP SWQCB collection effort is a screening study that focuses on the fishing beneficial use of sport fish along the coast, bays and estuaries of California.

1.1 Cruise Report

1.1 Objectives

Year one's objectives were to collect fish samples in southern California and along the coast near San Francisco Bay in coordination with the Bight '08 and the Regional Monitoring Program (RMP). Southern California was broken into twenty-seven zones determined by the Bight '08 which covered the coast, bays, and estuaries from the Mexican/Californian border to Pt. Conception. The nine coastal zones north and south of San Francisco Bay were to be sampled while the RMP sampled the San Francisco Bay. Five different fish species were targeted for all zones. Each sample was a composite of five individuals of one fish specie that were all within 75% total length of the largest individual. The Bight '08 added two more composites of five individuals for three of the five species for the southern California zones. The fish tissue was analyzed as directed by BOG and SWQCB in Work Order No. 08SWBG01 (see Section 1.3 below). Sample sites were reached by boating or hiking to a "species-specific" habitat with gill nets, cast nets, otter trawl, beach seine, hook and line and/or spearing.

1.2 Sampling personnel

Billy Jakl	MPSL/CDFG	Crew Lead
Dylan Service	MPSL/CDFG	Crew Lead
Gary Ichikawa	MPSL/CDFG	Crew Lead
Jon Goetzl	MPSL/CDFG	Research Tech
John Negrey	MPSL/CDFG	Research Tech

Steve Martenuk	MPSL/CDFG	Research Tech
Dustin Service	MPSL/CDFG	Research Tech
Bryan Frueh	MPSL/CDFG	Research Tech
Sean Mundell	MPSL/CDFG	Research Tech
Brynn Hooton	MPSL/CDFG	Research Tech
Adam Newman	MPSL/CDFG	Research Tech

Assistance from other Projects and Agencies

Ken Schiff, Dario Diehl	SCCWRP
Heather Gliniak, Erica Jarvis	DFG Los Alamitos Office
Adrienne Vincent	DFG Belmont Office
Eric Miller	MBC Applied Env. Science
Rick Starr, Noelle Yochum	Sea Grant
Erin Loury	MLML

1.3 Authorization to collect samples

All sampling personnel are MPSL staff (through San Jose State University Foundation) contracted through CDFG to conduct the sample collection activities listed herein. The funding and authorization to collect the samples described herein is contained in the State Water Resources Control Board (SWRCB) Work Order 08SWBG01, including the description of the number samples and species necessary to be collected at each zone.

1.4 Station reconnaissance and selection

CDFG /MPSL conducted the pre-sample collection reconnaissance activities by locating popular fishing areas within each zone. Popular fishing areas were determined from local knowledge and desktop reconnaissance. After reconnaissance, multiple areas were identified within each zone. BOG and SWQCB authorized all zones for fish collection and for specific types of tissue analyses as set forth in the Work Order 08SWBG01.

1.5 Summary of types of samples authorized to be collected

After reconnaissance, a total of sixty-nine zones were authorized for sample collection effort in order to assess the bioaccumulation of contaminants in California’s coastal fish. Thirty-six out of the sixty-nine were to be sampled in Year one. Five different species of fish were targeted for all zones. The target species were determined by: distribution along the coast, different pathways of exposure to contaminants (trophic level, feeding position in water column, etc.), commonly caught and consumed by anglers and that are good indicators of mercury, synthetic organics or selenium bioaccumulation. A list of Primary and Secondary target species was developed based on their ability to fulfill the above requirements (Table 4 and 5 of the BOG Coastal QAPP pages 92-95). Each sample was made up of five individuals of one fish specie that were all within 75% total length of the largest individual. A total of five samples were collected for each zone. The Bight ’08 added two more composites of five individuals for three of the five species for the southern California zones. For more detailed information reference section “E 1.” of the BOG Coastal QAPP.

Physical parameters were collected for each fish, which included: weight, total length, fork length, sex and presence of any abnormalities. The fish was tagged with a unique number and was then wrapped in aluminum foil and placed in a zipper-closure bag and stored on dry ice for the duration of the trip. At the MPSL/DFG lab, samples were stored in a freezer until they were processed for authorized analysis, per appropriate SOP's. Analysis authorization dictates tissue compositing and analysis (QA/QC requirements-preservatives, aliquoting, cooling, etc.).

1.6 Discussion

The absence of target fish and bad weather were the major problems encountered during sampling. Multiple efforts were made to locate target species by talking to local fisherman and researching habitat favored by target species.

1.7 Results

Fish tissue samples were collected for all thirty-six zones authorized. A great deal of effort was given to collect complete composites of Primary target species. Sample composites size and fish species were altered to complete zones that lacked Primary target species.

1.8 Description of Sample Collection Stations

Multiple CDFG/MPSL teams sampled the authorized zones. Descriptions and maps of sample collection for all zones, effort per zone, and species sampled are in table 1.8.1 and 1.8.2 below.

Map Legend: Green (fish collected) Red (no fish collected)

Circle (hook and line), Square (otter trawl), Triangle (pole spear), Hexagon (net)

1.8.1 Table of Contents for Sample Collection in Southern California Coastal/Harbor Zones

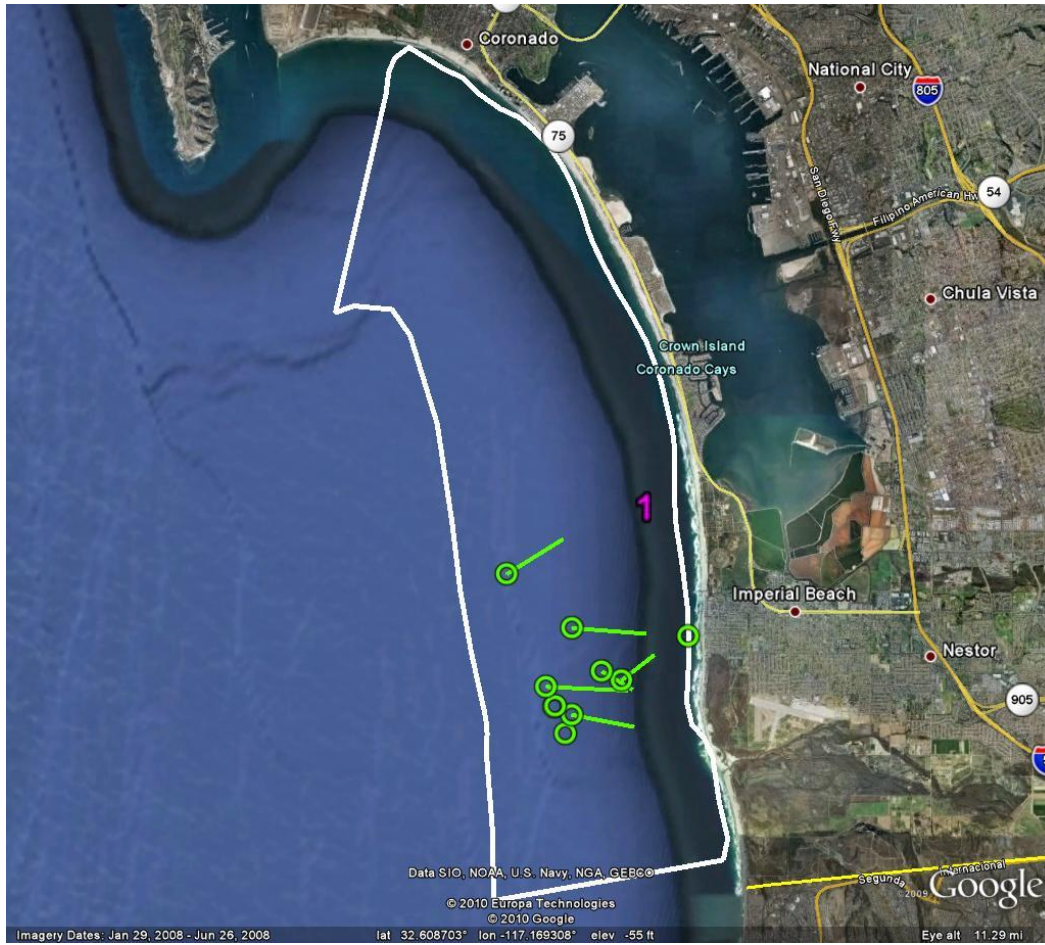
Zone Name (Number)	Page	Zone Name (Number)	Page
TJ to North Island (Zone 1)	5	Long Beach (Zone 15)	20
San Diego South Bay (Zone 2)	6	San Pedro Bay (Zone 16)	21
San Diego North Bay (Zone 3)	7	Catalina Island (Zone 17)	22
Pt Loma (Zone 4)	8	Palos Verdes (Zone 18)	23
Pt Loma to La Jolla (Zone 5)	10	South Santa Monica Bay (Zone 19)	24
Mission Bay (Zone 6)	11	Middle Santa Monica Bay (Zone 20)	25
La Jolla to San Onofre (Zone 7)	12	North Santa Monica Bay (Zone 21)	26
Oceanside Harbor (Zone 8)	13	Pt Dume to Oxnard (Zone 22)	27
San Onofre to Crystal Cove (Zone 9)	14	Northern Channel Islands (Zone 23)	28
Dana Point Harbor (Zone 10)	15	Ventura to Rincon (Zone 24)	29
Crystal Cove to Santa Ana River (Zone 11)	16	Rincon to Goleta (Zone 25)	30
Newport Bay (Zone 12)	17	Santa Barbara Channel Oil Platform (Zone 26)	31
Santa Ana River to Seal Beach (Zone 13)	18	Goleta to Pt Conception (Zone 27)	32
Orange County Oil Platforms (Zone 14)	19		

1.8.2 Table of Contents for Sample Collection in Coastal Zones near San Francisco

Zone Name (Number)	Page	Zone Name (Number)	Page
San Mateo Coast (Zone 45)	33	Farallon Islands (Zone 50)	38
Pillar Point Harbor (Zone 46)	34	Southern Marin Coast (Zone 51)	39
Half Moon Bay Coast (Zone 47)	35	Tomales Bay (Zone 52)	40
Pacifica Coast (Zone 48)	36	Northern Marin Coast (Zone 53)	41
San Francisco Coast (Zone 49)	37		

References

Bonnema, A. 2009. Quality Assurance Project Plan: Screening Study of Bioaccumulation on the California Coast. Moss Landing Marine Labs. Prepared for SWAMP BOG, 53 pages plus appendices and attachments.



Station Name and Code: TJ to North Island, 91001TJNI (Zone 1)

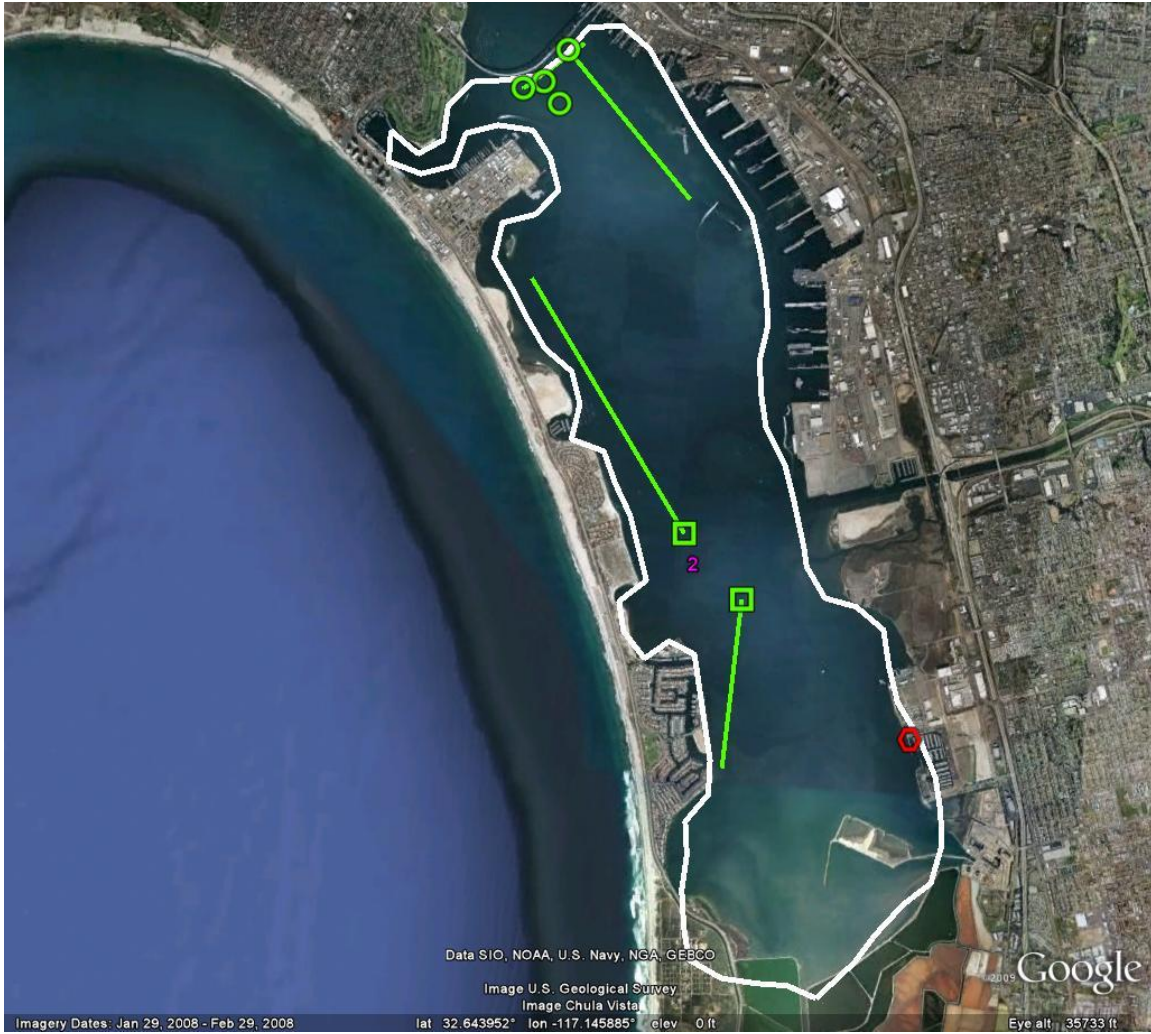
Date (s) of Collection: May 12, 20, 27, and June 2-3, 2009

Collection Method: Hook and Line

Fish Collected:

California Halibut (n=2)			White Surfperch (n=2)										
TL (mm)	752	824	TL (mm)	148	148								
Barred Sand Bass (n=16)													
TL (mm)	330	336	337	345	346	352	358	359	362	366	367		
	381	383	391	402	411								
Chub Mackerel (n=19)													
TL (mm)	201	268	290	294	296	297	301	303	305	310	314	315	
	320	320	327	330	333	335	335						
Kelp Bass (n=15)													
TL (mm)	308	310	314	315	320	320	340	340	350	354	355	356	
	366	393	404										
Spotted Scorpionfish (n=15)													
TL (mm)	275	279	287	290	292	298	300	300	305	311	315	322	
	322	347	363										
White Croaker (n=25)													
TL (mm)	184	193	204	209	212	218	220	221	221	224	226	227	228
	230	232	233	241	242	242	243	244	246	246	254	273	

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Station Name and Code: SD South Bay, 91202SDSB (Zone 2)

Date (s) of Collection: May 19, 27, and June 1, 3, 8, 2009

Collection Method: Hook and Line, Otter trawl, Castnet

Fish Collected:

Shiner Surfperch (n=22)														
Barred Sand Bass (n=4)														
TL (mm)	154	212	260	307										
Black Croaker (n=5)														
TL (mm)	215	227	246	253	277									
Chub Mackerel (n=6)														
TL (mm)	237	239	247	254	254	257								
California Halibut (n=1)			Diamond Turbot (n=2)				Gray Smoothound Shark (n=3)							
TL (mm)	601	TL (mm)		211	221	TL (mm)			616	623	685			
Spotted Sand Bass (n=25)														
TL (mm)	195	195	230	252	306	307	307	308	309	315	321	324	325	325
	325	326	330	330	331	334	336	340	342	345	362			
White Croaker (n=16)														
TL (mm)	288	297	298	303	308	310	312	312	315	324	328	337		
	338	339	344	376										

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Station Name and Code: SD North Bay, 91202SDNB (Zone 3)

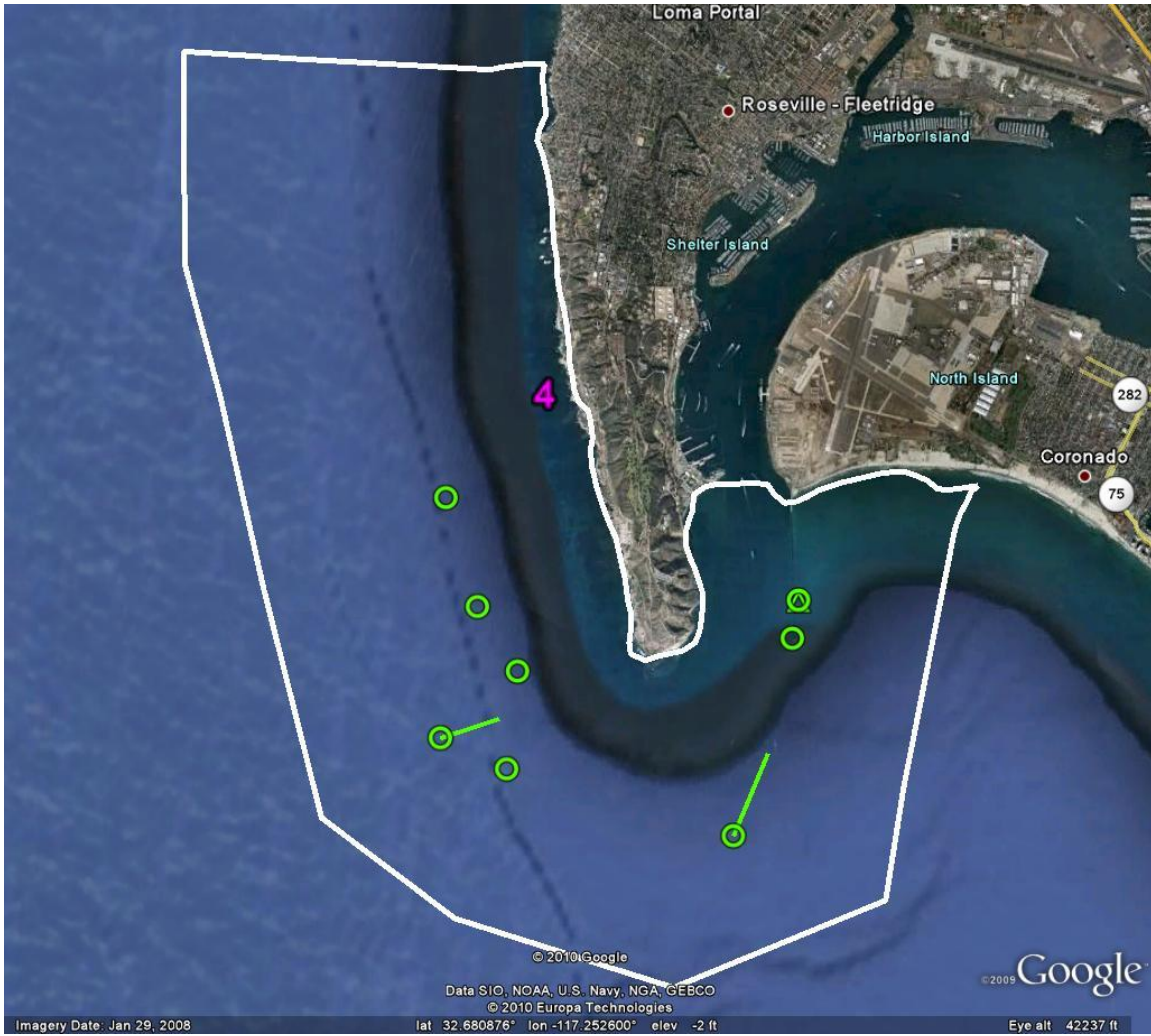
Date (s) of Collection: May 19, 27, and June 1, 3, 8, 2009

Collection Method: Hook and Line, Otter trawl

Fish Collected:

Shiner Surfperch (n=31)															
California Halibut (n=1)															
TL (mm)	643														
		Pacific Angel Shark (n=1)													
		TL (mm)										1400			
Gray Smoothhound Shark (n=5)					Spotted Scorpionfish (n=4)										
TL (mm)	624	631	635	638	936	TL (mm)						281	287	297	312
Chub Mackerel (n=18)															
TL (mm)	204	206	210	210	211	211	211	212	213	215	217	221			
	224	225	225	231	237	240									
Spotted Sand Bass (n=20)															
TL (mm)	265	290	306	306	307	310	310	311	314	318	322	325			
	325	330	332	340	342	345	360	371							
Barred Sand Bass (n=21)															
TL (mm)	257	261	334	336	350	360	361	368	368	379	393	396			
	398	401	405	412	428	431	432	432	497						

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Station Name and Code: Pt Loma, 90804PLMA (Zone 4)

Date (s) of Collection: May 7, 12, 13, 26, 2009

Collection Method: Hook and Line, Spears

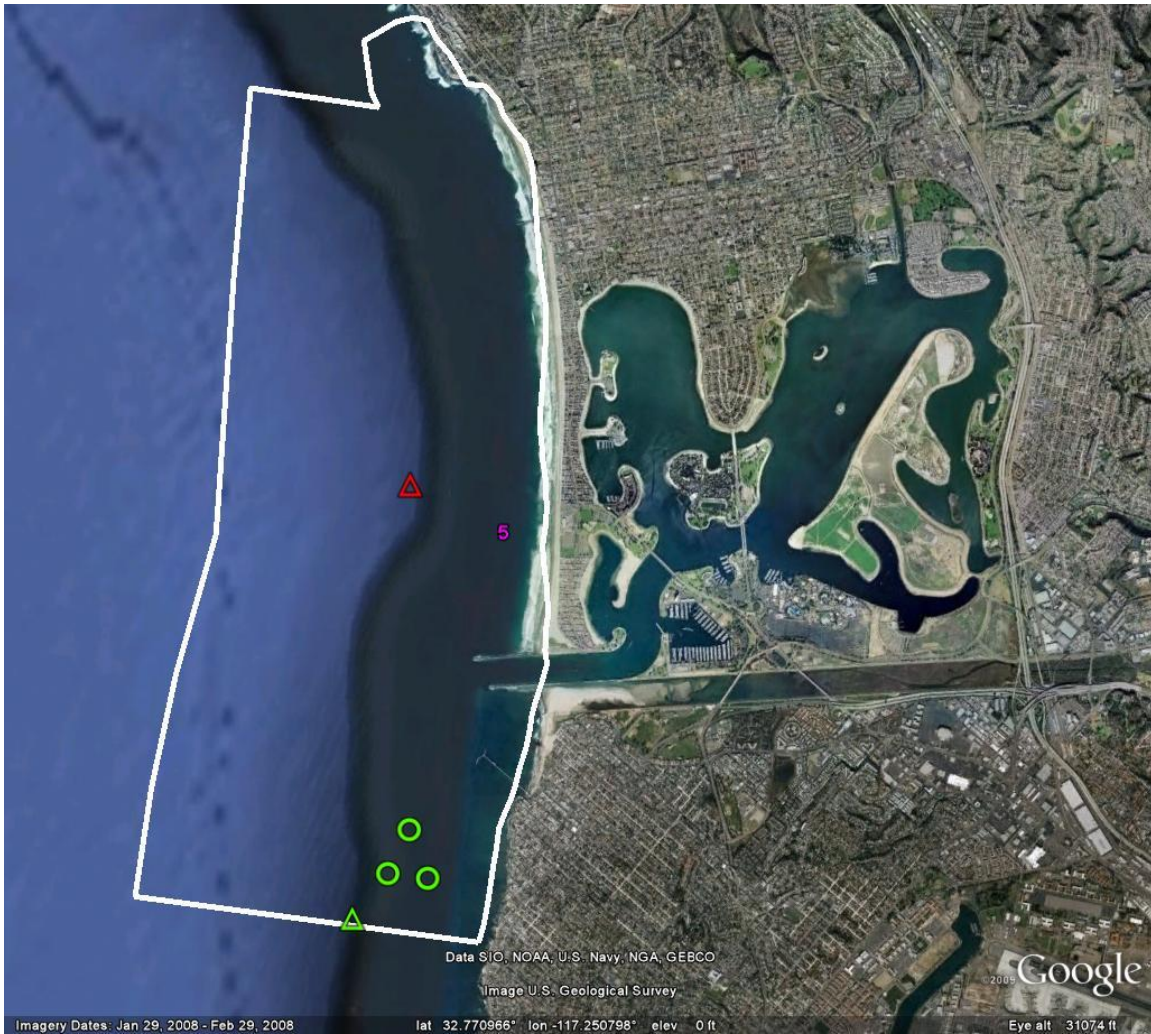
Fish Collected:

Spotted Sand Bass (n=2)			Pacific Sanddab (n=3)						Starry Rockfish (n=1)		
TL (mm)	300	370	TL (mm)	162	168	204				TL (mm)	327
Brown Rockfish (n=1)			Cabezon (n=1)								
TL (mm)	255		TL (mm)	372							
Pacific Barracuda (n=1)			Greenspotted Rockfish (n=2)								
TL (mm)	587		TL (mm)			206	221				
Vermillion Rockfish (n=3)				Kelp Rockfish (n=3)							
TL (mm)	276	290	309	TL (mm)	268	280	281				
Barred Sand Bass (n=4)					Spotted Scorpionfish (n=4)						
TL (mm)	331	349	372	387	TL (mm)		318	331	340	374	
Treefish (n=5)											
TL (mm)	287	289	292	304	320						

Fish Collected: Continued Pt Loma, 90804PLMA

Gopher Rockfish (n=13)															
TL (mm)	223	229	230	231	231	232	234	234	236	236	247	254	254		
Black Perch (n=15)															
TL (mm)	182	216	226	238	240	245	250	256	257	264	264	272	273	282	289
Chub Mackerel (n=19)															
TL (mm)	210	217	221	227	227	230	232	232	235	248	256	278	283	289	295
	300	312	323	326											
Kelp Bass (n=19)															
TL (mm)	294	302	314	316	321	324	325	329	334	335	344	345	346	347	353
	355	403	417	495											
White Croaker (n=22)															
TL (mm)	186	198	204	214	214	216	221	222	224	226	232	234	235	237	241
	246	258	262	264	268	270	276								

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Station Name and Code: Pt Loma to La Jolla, 90605PLLJ (Zone 5)

Date (s) of Collection: June 9, 10, 16, 17, 2009

Collection Method: Hook and Line, Spears

Fish Collected:

Yellowtail Rockfish (n=3)				Vermillion Rockfish (n=1)											
TL (mm)	296	311	323	TL (mm)		346									
Barred Sand Bass (n=1)			Black Perch (n=1)												
TL (mm)	390		TL (mm)		270										
Gopher Rockfish (n=9)															
TL (mm)	174	182	193	193	204	211	212	215	295						
Chub Mackerel (n=16)															
TL (mm)	230	232	234	234	235	235	238	239	240	240	240	240	250	255	
	257	258													
Kelp Bass (n=26)															
TL (mm)	185	227	240	266	274	286	289	292	295	305	305	305	308	310	310
	314	315	320	321	322	335	335	369	400	420	512				

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Station Name and Code: Mission Bay, 90606MISS (Zone 6)

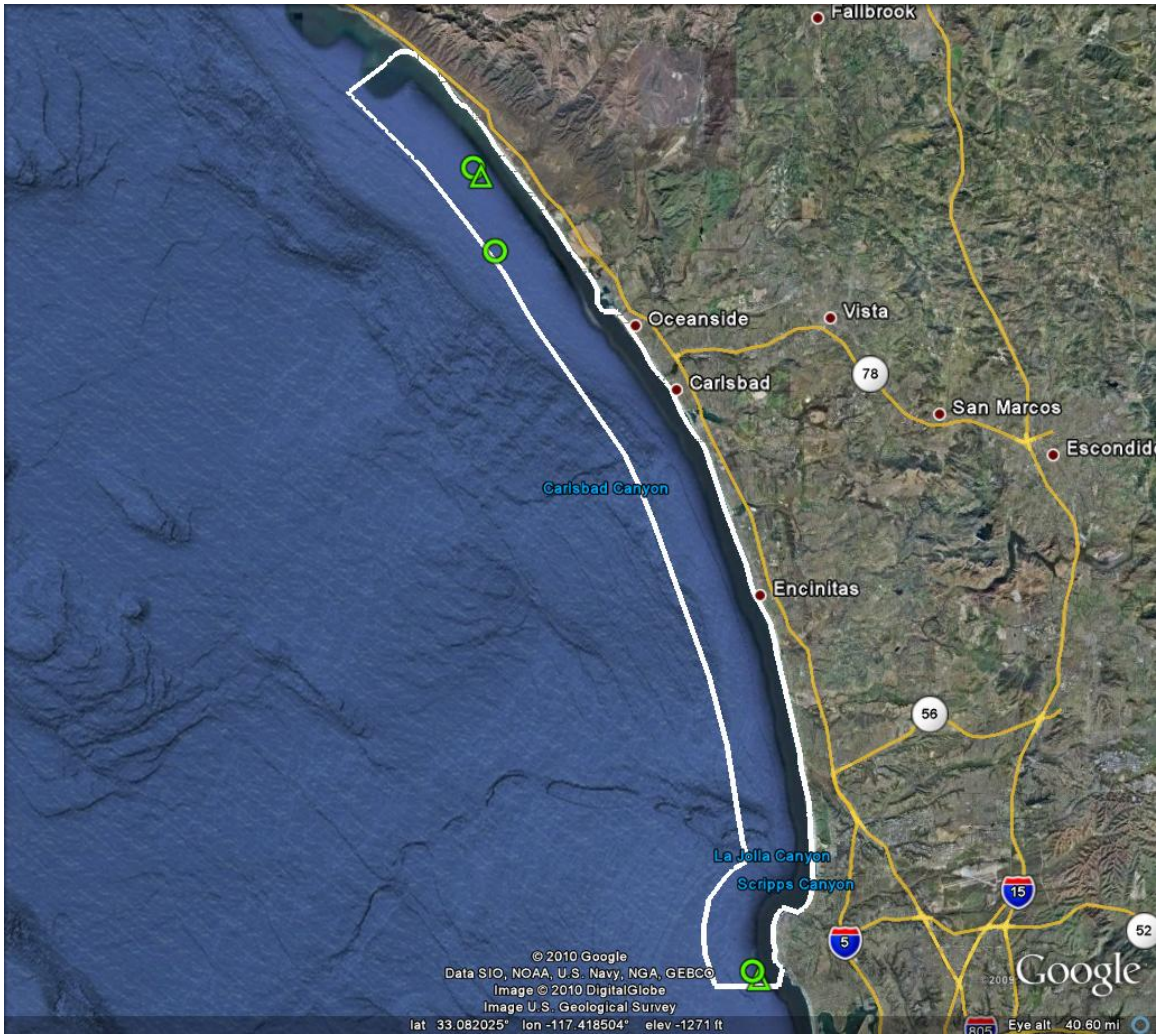
Date (s) of Collection: June 9, 11, 15, 16, 17, 2009

Collection Method: Hook and Line, Beach seine, Gill net, Otter trawl, Cast net

Fish Collected:

Gray Smoothhound Shark (n=1)				Horn Shark (n=1)											
TL (mm)		643		TL (mm)		749									
Barred Sand Bass (n=2)			Kelp Bass (n=3)												
TL (mm)	193	210	TL (mm)	187	200	330									
Yellowfin Croaker (n=5)															
TL (mm)	198	213	269	302	316										
Rainbow Surfperch (n=10)															
TL (mm)	215	220	220	227	235	235	237	240	244	252					
White Surfperch (n=14)															
TL (mm)	181	182	182	190	190	191	206	209	226	234	242	246	257	345	
Spotted Sand Bass (n=17)															
TL (mm)	284	295	306	306	306	320	322	327	330	340	351	355	385	387	
	393	400	430												
Shiner Surfperch (n=32)				Top Smelt (n=21)											

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Station Name and Code: La Jolla to San Onofre, 90407LJSO (Zone 7)

Date (s) of Collection: June 10, 17, 22, 23, 2009

Collection Method: Hook and Line, Spear

Fish Collected:

White Surfperch (n=3)														
TL (mm)	166	176	180											
Barred Sand Bass (n=5)														
TL (mm)	277	295	300	401	590									
Rainbow Surfperch (n=7)														
TL (mm)		163	164	167	170	186	225	249						
Chub Mackerel (n=16)														
TL (mm)	220	223	230	230	231	232	232	234	238	240	242	243	247	250
	257	278												
White Croaker (n=16)														
TL (mm)	190	190	190	191	192	193	196	196	203	209	211	215	216	216
	220	226												
Kelp Bass (n=18)														
TL (mm)	234	252	270	279	280	295	296	306	310	315	320	321	325	330
	355	369	375	393										

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Station Name and Code: Oceanside Harbor, 90208OCNH (Zone 8)

Date (s) of Collection: June 22, 2009

Collection Method: Otter trawl

Fish Collected:

Spotted Sand Bass (n=1)																
TL (mm)	387															
California Halibut (n=1)				Barred Surfperch (n=2)				Spotted Sand Bass (n=1)								
TL (mm)	624	TL (mm)	190	194	TL (mm)	387										
Queenfish (n=4)					White Croaker (n=4)											
TL (mm)	156	160	170	174	TL (mm)	165	174	175	187							
White Surfperch (n=6)																
TL (mm)	189	189	205	212	230	257										
Yellowfin Croaker (n=16)																
TL (mm)	175	185	188	188	189	190	190	190	191	194	194	195	195	197		
	202	215														
Spotfin Croaker (n=14)																

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Station Name and Code: San Onofre to Crystal Cove, 90109SOCC (Zone 9)

Date (s) of Collection: June 22, 23, 24, 2009

Collection Method: Hook and Line, Beach Seine

Fish Collected:

Pacific Barracuda (n=4)														
TL (mm)	450	465	492	590										
Chub Mackerel (n=15)														
TL (mm)	250	264	270	275	278	280	281	284	284	288	288	288	290	297
	301													
Barred Sand Bass (n=16)														
TL (mm)	305	305	306	310	313	315	321	325	325	328	330	335	344	346
	366	430												
Kelp Bass (n=22)														
TL (mm)	267	270	281	282	290	291	305	305	305	305	306	306	307	309
	310	311	312	322	334	340	360	376						

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Station Name and Code: Dana Point Harbor, 90110DANA (Zone 10)

Date (s) of Collection: June 23, 24, 2009

Collection Method: Hook and Line, Otter trawl, Cast net

Fish Collected:

Gray Smoothhound Shark (n=1)		Spotted Sand Bass (n=2)	
TL (mm)	810	TL (mm)	316 320
White Croaker (n=4)			
TL (mm)	193	245	262 270
Opaleye (n=5)			
TL (mm)	194	206	221 225 230
Sargo (n=6)			
TL (mm)	227	267	269 278 280 298
Rainbow Surfperch (n=7)			
TL (mm)	155	160	189 192 198 205 210
White Surfperch (n=11)			
TL (mm)	130	163	165 167 179 181 205 220 220 220 222
Spotfin Croaker (n=16)			
TL (mm)	150	202	204 205 207 212 215 218 221 230 240 244 246 335
	382	417	
Shiner Surfperch (n=25)		Top Smelt (n=16)	

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Station Name and Code: Crystal Cove to Santa Ana River, 8011CCSA (Zone 11)

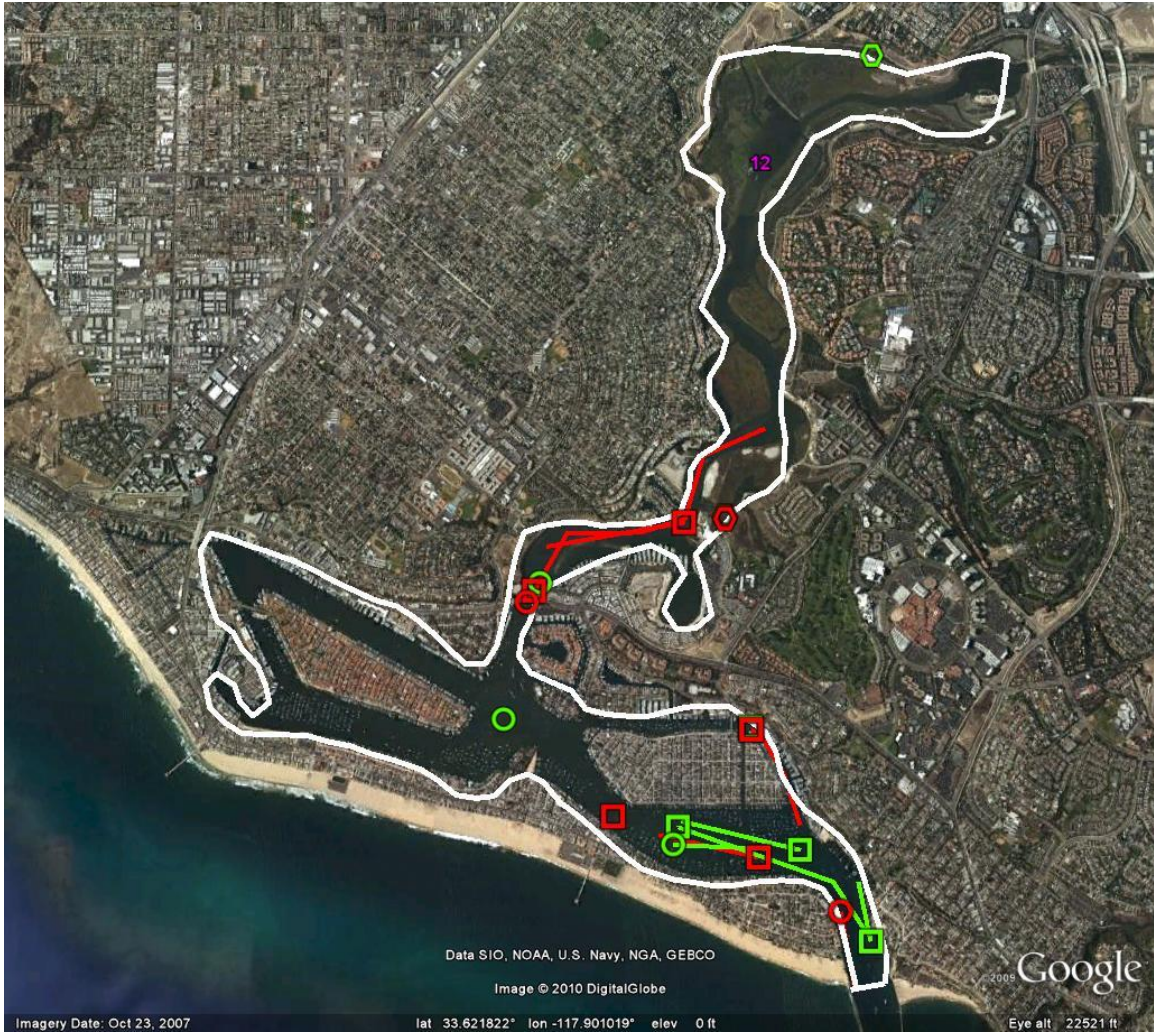
Date (s) of Collection: June 24, 25, 29, 30, July 1, 6, Oct 20, 21, 2009

Collection Method: Hook and Line, Gill Net, Beach Seine

Fish Collected:

California Halibut (n=1)				Black Perch (n=1)										
TL (mm)		810		TL (mm)		170								
Barred Sand Bass (n=3)				Queenfish (n=3)										
TL (mm)	340	360	365	TL (mm)	211	250	280							
Brown Smooth-hound Shark (n=4)														
TL (mm)	973	977	1066	1144										
Senorita (n=5)					Pacific Sanddab (n=6)									
TL (mm)	201	211	225	227	229	TL (mm)	168	174	176	180	191	230		
Blacksmith (n=8)														
TL (mm)	185	200	203	211	211	215	220	238						
Kelp Bass (n=16)														
TL (mm)	250	262	278	296	309	310	330	334	358	359	375	381	410	441
	455	465												
Chub Mackerel (n=17)				White Croaker (n=15)										

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Station Name and Code: Newport Bay, 80112NWPT (Zone 12)

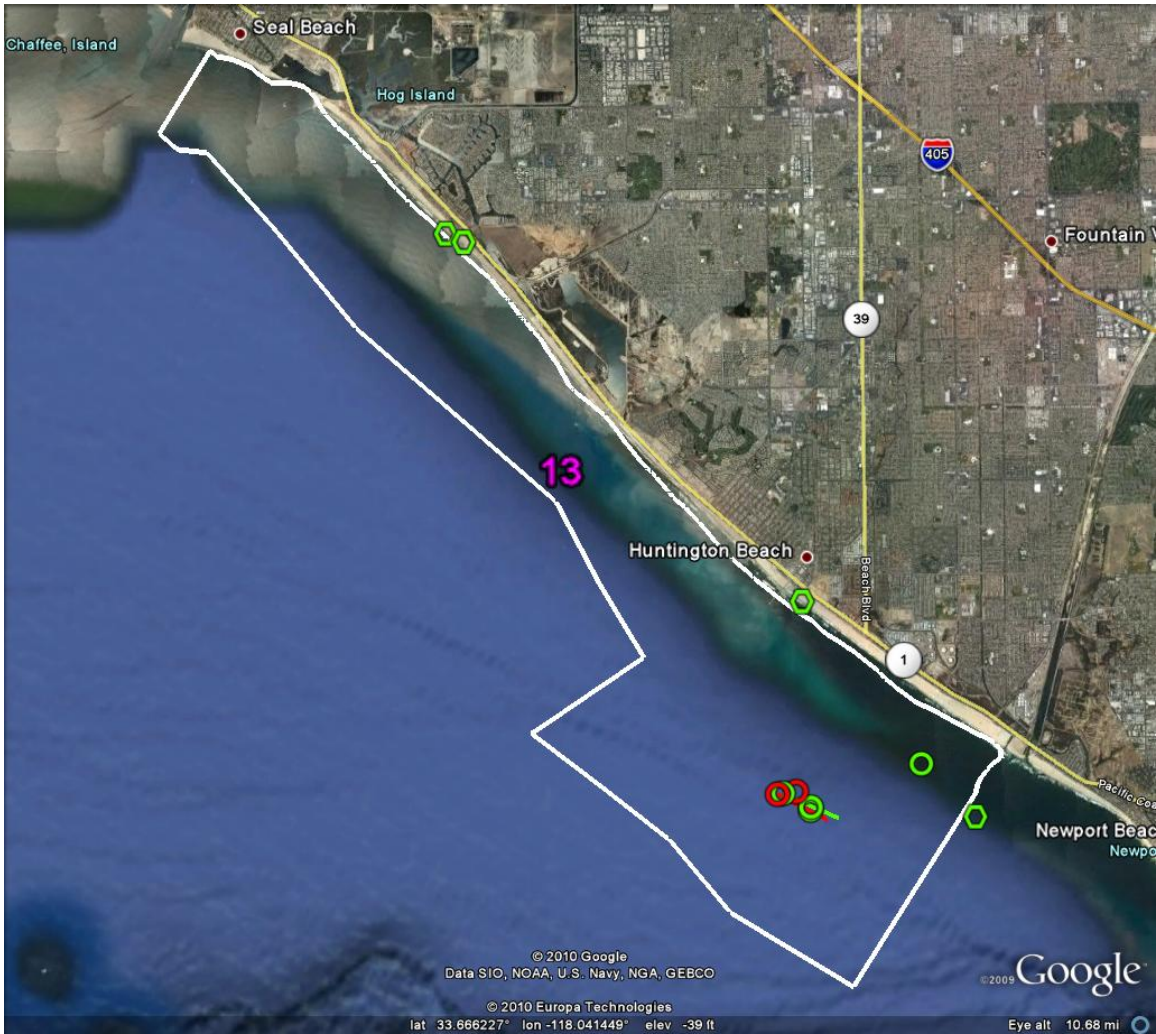
Date (s) of Collection: June 16, 17, 18, July 25, Oct 21, 2009

Collection Method: Hook and Line, Beach Seine

Fish Collected:

Barred Sand Bass (n=1)		White Surfperch (n=5)								
TL (mm)	314	TL (mm)	150	164	179	188	240			
Black Perch (n=8)										
TL (mm)	152	165	165	166	177	181	185	228		
Spotted Sand Bass (n=10)										
TL (mm)	315	320	336	342	350	351	366	375	382	397
Shiner Surfperch (n=14)		White Croaker (n=17)			Top Smelt (n=74)					

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Station Name and Code: Santa Ana River to Seal Beach, 80113SASB (Zone 13)

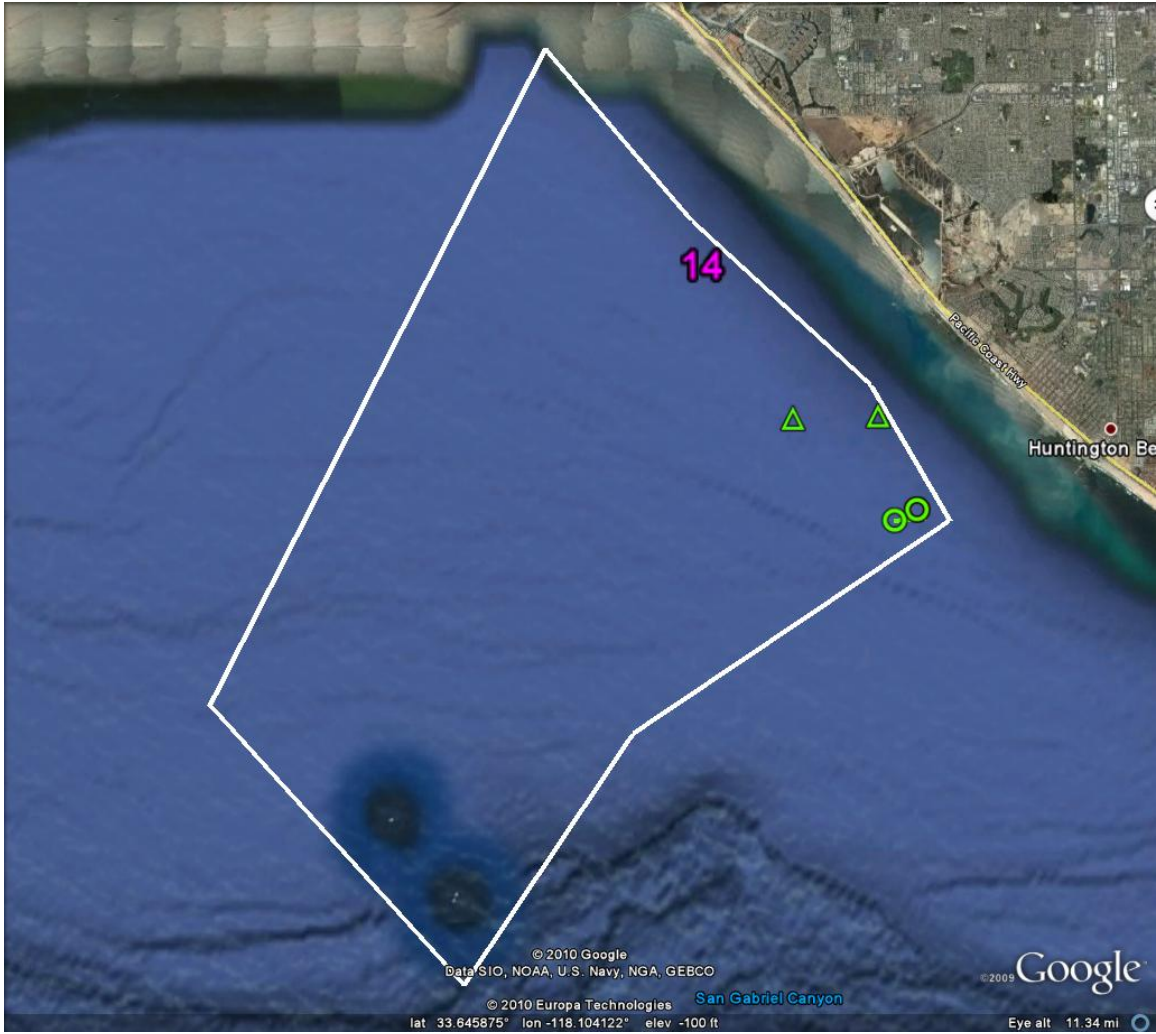
Date (s) of Collection: May 27, June 24, 29, 30, July 1, 8, 2009

Collection Method: Hook and Line, Gill Net, Beach Seine

Fish Collected:

Cabezon (n=1)		Pacific Sanddab (n=2)													
TL (mm)	239	TL (mm)						211	217						
Brown Smooth-hound Shark (n=3)				Spotted Scorpionfish (n=3)											
TL (mm)	1019	1067	1124	TL (mm)			247	249	256						
Barred Sand Bass (n=4)					Blacksmith (n=4)										
TL (mm)	273	291	330	336	TL (mm)		188	197	203	245					
Barred Surfperch (n=8)															
TL (mm)	185	186	191	192	196	231	235	245							
Kelp Bass (n=9)															
TL (mm)	230	232	255	257	269	272	277	283	290						
Chub Mackerel (n=18)															
TL (mm)	217	226	230	232	233	234	234	235	236	237	238	240	240	242	243
	243	248	250												
Pacific Sardine (n=13)			Spotfin Croaker (n=5)												

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Station Name and Code: Orange County Oil Platforms, 80114ORCO (Zone 14)

Date (s) of Collection: August 11, Oct 1, November 3, 2009

Collection Method: Hook and Line, Spear

Fish Collected:

White Croaker (n=6)															
TL (mm)	206	209	212	216	240	240									
Pile Surfperch (n=5)															
TL (mm)	329	341	345	348	370										
Barred Sand Bass (n=7)															
TL (mm)	345	355	361	385	396	405	405								
Kelp Bass (n=17)															
TL (mm)	295	295	305	305	312	315	316	320	324	326	329	346	349	364	365
	385	406													
Chub Mackerel (n=20)			Blacksmith (n=5)												

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Station Name and Code: Long Beach, 40515LNGB (Zone 15)

Date (s) of Collection: May 8, June 30, July 1, 6, 2009

Collection Method: Hook and Line, Gillnet, Otter Trawl, Beach Seine

Fish Collected:

California Halibut (n=3)																	
TL (mm)	266	320	427														
Brown Smooth-hound Shark(n=3)				Barred Sand Bass (n=3)													
TL (mm)	910	970	982	TL (mm)	305	347	420										
Diamond Turbot (n=7)																	
TL (mm)	197	205	215	220	222	238	322										
Top Smelt (n=11)																	
TL (mm)	165	175	187	213	230	252	266	272	296	305	311						
White Croaker (n=15)																	
TL (mm)	199	207	209	210	211	211	214	218	220	222	223	226	226	237	244		
Chub Mackerel (n=16)																	
TL (mm)	285	285	288	288	289	290	290	290	292	297	300	301	301	304			
	314	324															
Shiner Surfperch (n=4)						Yellowfin Croaker (n=17)											

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Station Name and Code: San Pedro Bay, 41116SPDB (Zone 16)

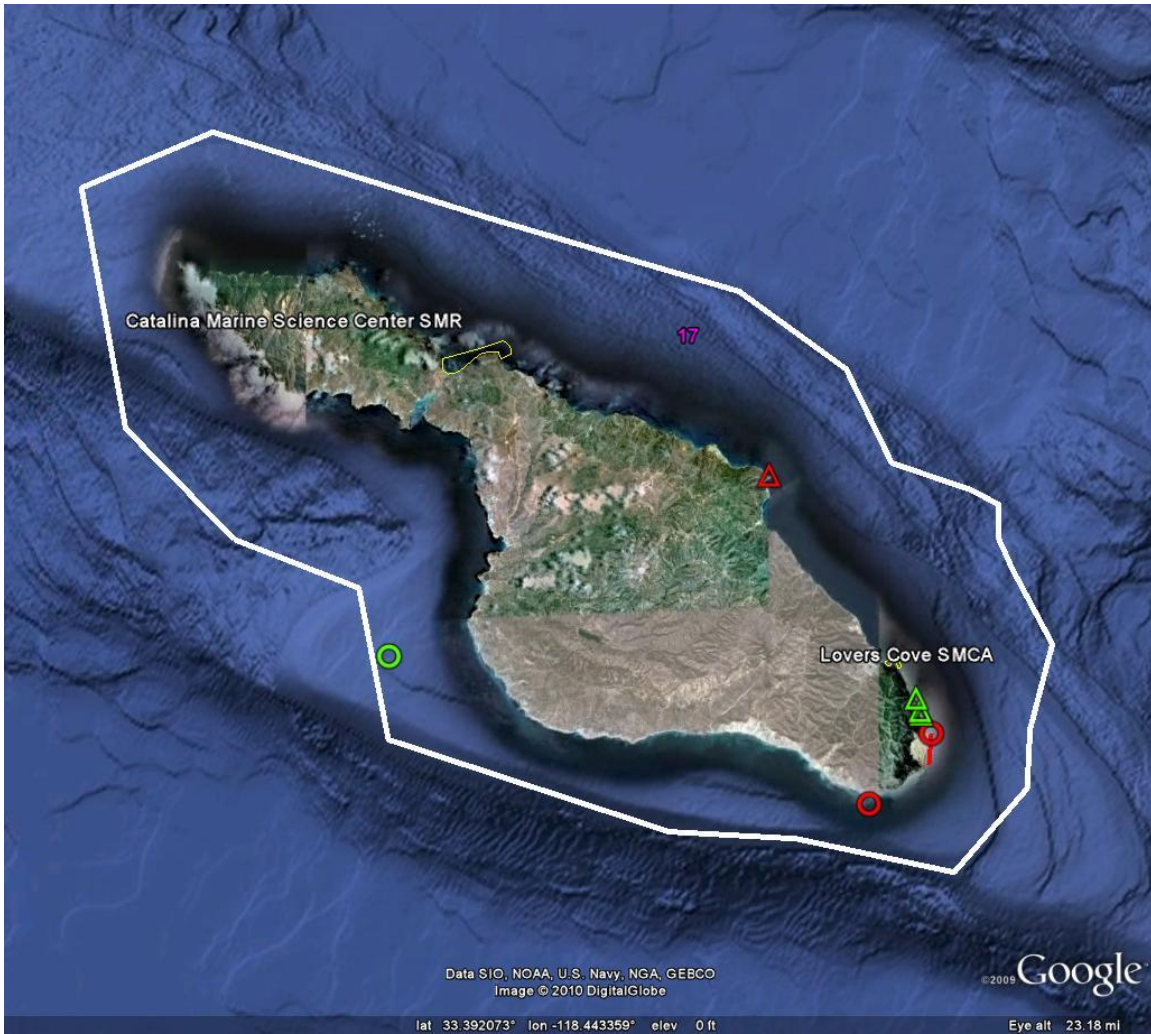
Date (s) of Collection: July 2, 6, 7, 2009

Collection Method: Hook and Line, Gillnet, Otter Trawl, Cast net

Fish Collected:

Spiny dogfish (n=3)													
TL (mm)	995	1011	1140										
Copper Rockfish (n=4)						Barred Sand Bass (n=5)							
TL (mm)	263	316	326	330	TL (mm)	264	296	305	310	325			
Black Perch (n=8)													
TL (mm)	160	166	170	175	176	250	270	290					
White Croaker (n=20)													
TL (mm)	185	189	192	195	196	200	201	202	203	205	206	207	214
	215	218	218	221	224	225	236						
Chub Mackerel (n=2)			Top Smelt (n=1)			Shiner Surfperch (n=11)							
White Surfperch (n=9)													

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Station Name and Code: Catalina Island, 40617CATI (Zone 17)

Date (s) of Collection: Sep 28, 29, 30, 2009

Collection Method: Hook and Line, Spear

Fish Collected:

Opaleye (n=11)														
TL (mm)	262	276	278	282	285	286	290	295	304	312	325			
Halfmoon (n=13)														
TL (mm)	252	258	260	265	270	275	280	286	290	292	294	305	315	
Kelp Bass (n=14)														
TL (mm)	242	295	295	295	303	305	307	313	317	338	364	410	435	475
Chub Mackerel (n=22)		Black Perch (n=15)				Ocean Whitefish (n=6)				Rosy Rockfish (n=5)				

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Station Name and Code: Palos Verdes, 40418PVER (Zone 18)

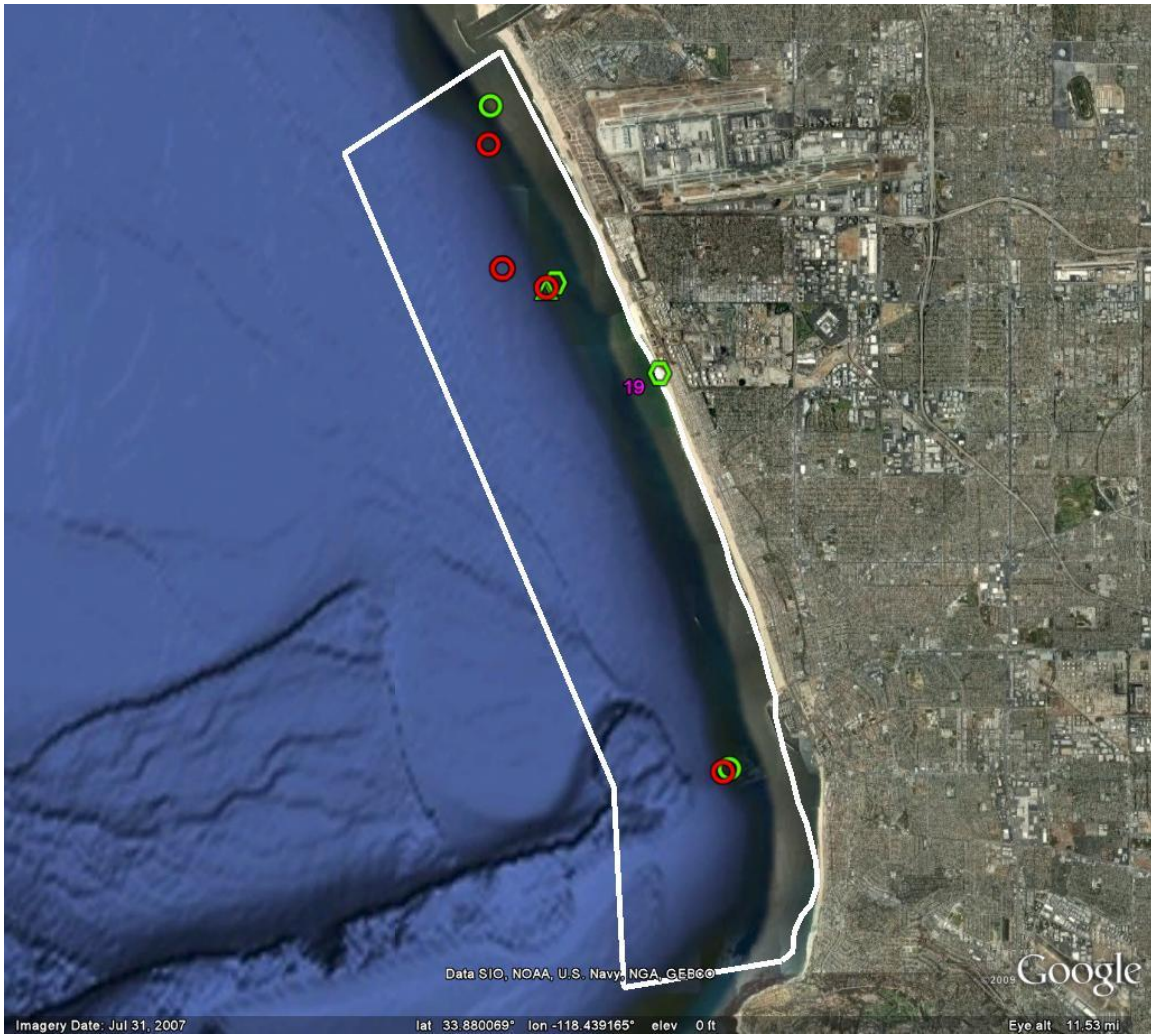
Date (s) of Collection: July 7, 8, Oct 22, 2009

Collection Method: Hook and Line, Spear

Fish Collected:

Brown Rockfish (n=7)													
TL (mm)	269	275	281	286	292	294	391						
Black Perch (n=11)													
TL (mm)	218	219	228	231	245	251	258	266	268	283	296		
Kelp Bass (n=13)													
TL (mm)	275	276	282	291	305	308	310	315	325	363	375	388	396
White Croaker (n=17)													
TL (mm)	176	184	187	196	200	201	202	203	205	206	210	210	211
	211	216	217	228									
Chub Mackerel (n=15)			Jack Mackerel (n=18)				Rubberlip Surfperch (n=4)				Gopher Rockfish (n=4)		

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Station Name and Code: South Santa Monica Bay, 40419SSMB (Zone 19)

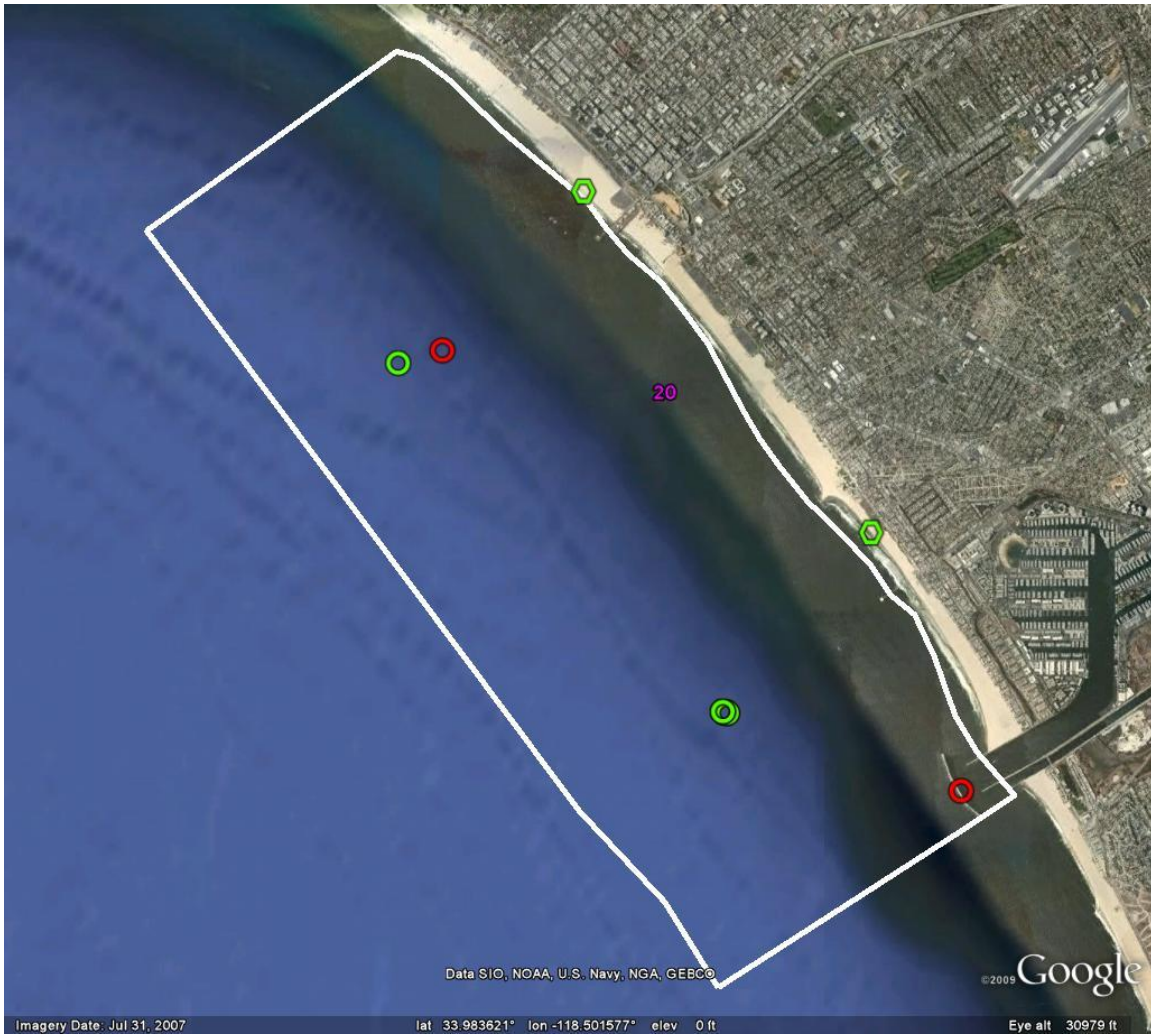
Date (s) of Collection: July 13, 14, 22, 2009

Collection Method: Hook and Line, Spear, Beach Seine, Gillnet

Fish Collected:

White Surfperch (n=4)					California Corbina (n=5)								
TL (mm)	214	222	223	224	TL (mm)	456	484	512	522	584			
Barred Surfperch (n=5)					Rubberlip Surfperch (n=6)								
TL (mm)	176	180	181	186	196	TL (mm)	212	217	235	244	244	359	
Kelp Bass (n=22)													
TL (mm)	204	231	297	307	309	310	311	320	321	322	327	329	330
	333	334	337	339	342	343	362	364	366				
Barred Sand Bass (n=17)													
TL (mm)	284	307	326	327	331	334	334	339	339	340	345	350	361
	364	366	389	417									
Black Croaker (n=19)													
TL (mm)	206	211	212	224	224	226	237	238	240	250	250	252	257
	266	266	270	289	292	332							
White Croaker (n=15)			Chub Mackerel (n=16)			Pacific Sanddab (n=5)							

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Station Name and Code: Middle Santa Monica Bay, 40420MSMB (Zone 20)

Date (s) of Collection: July 13, 14, 15, 16, 20, 2009

Collection Method: Hook and Line, Beach Seine

Fish Collected:

Black Croaker (n=3)				Gopher Rockfish (n=3)									
TL (mm)	234	242	261	TL (mm)	200	219	232						
Barred Surfperch (n=5)					California Corbina (n=5)								
TL (mm)	122	179	186	187	198	TL (mm)	484	498	511	529	530		
Barred Sand Bass (n=8)													
TL (mm)	307	342	353	361	381	401	404	559					
Spotted Scorpionfish (n=18)													
TL (mm)	170	174	200	214	214	214	215	231	242	245	256	258	260
	265	271	272	294	307								
Kelp Bass (n=20)													
TL (mm)	224	240	249	251	252	259	265	266	270	276	287	292	292
	296	296	296	322	360	369	504						
Chub Mackerel (n=17)													

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Station Name and Code: North Santa Monica Bay, 40421NSMB (Zone 21)

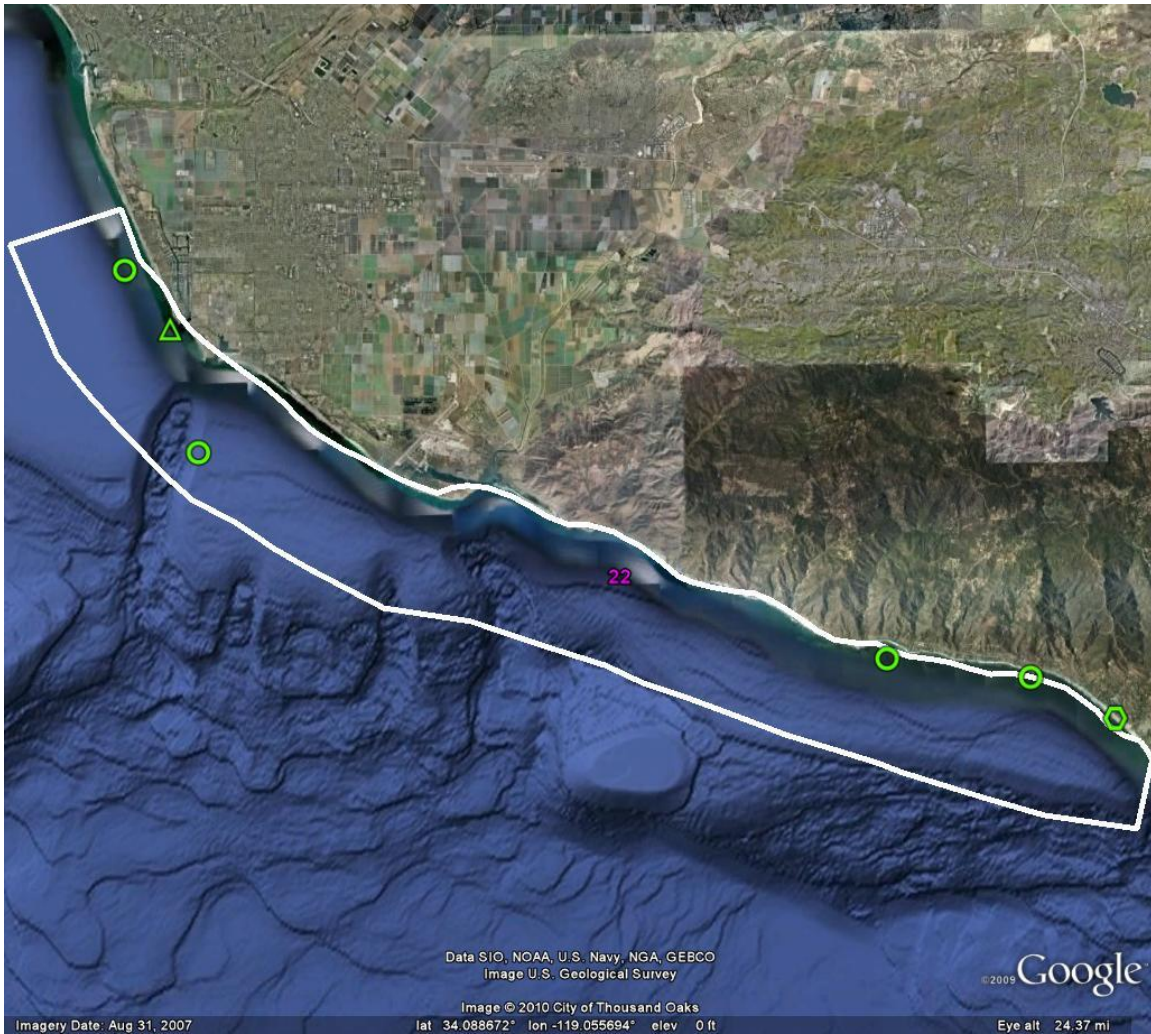
Date (s) of Collection: July 15, 21, 2009

Collection Method: Hook and Line, Spear

Fish Collected:

Barred Sand Bass (n=3)				Brown Rockfish (n=5)									
TL (mm)	327	341	342	TL (mm)	215	267	270	294	301				
Black Perch (n=6)													
TL (mm)	217	230	238	247	255	256							
Kelp Rockfish (n=8)													
TL (mm)	234	265	267	279	290	292	299	306					
White Surfperch (n=8)													
TL (mm)	185	187	192	194	199	219	220	220					
Kelp Bass (n=19)													
TL (mm)	265	268	271	305	305	306	306	310	311	325	337	339	349
	350	353	361	372	446	449							
Chub Mackerel (n=21)													

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Station Name and Code: Pt Dume to Oxnard, 40422PTDU (Zone 22)

Date (s) of Collection: July 16, 21, 22, 28 2009

Collection Method: Hook and Line, Spear, Beach Seine

Fish Collected:

Barred Sand Bass (n=1)		Brown Rockfish (n=1)											
TL (mm)	349	TL (mm)		300									
Rubberlip Surfperch (n=3)			Barred Surfperch (n=3)										
TL (mm)	328	331	361	TL (mm)	177	178	194						
Pile Surfperch (n=5)					Gopher Rockfish (n=7)								
TL (mm)	186	190	206	209	271	TL (mm)	147	156	158	160	162	162	171
Black Perch (n=8)													
TL (mm)	174	179	195	200	206	215	236	261					
Kelp Bass (n=17)													
TL (mm)	307	308	309	310	310	310	312	312	314	316	316	338	344
	366	372	372	386									
Chub Mackerel (n=16)						White Croaker (n=16)							

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Station Name and Code: Northern Channel Islands, 31623NCHI (Zone 23)

Date (s) of Collection: July 29, August 4 2009

Collection Method: Hook and Line, Spear

Fish Collected:

Grass Rockfish (n=2)													
TL (mm)		345		432									
Brown Rockfish (n=5)													
TL (mm)	288	289	295	297	340								
Black Perch (n=8)													
TL (mm)	254	280	287	290	294	294	295	316					
Kelp Bass (n=12)													
TL (mm)	290	305	306	307	315	315	337	339	346	350	357	486	
Kelp Rockfish (n=21)													
TL (mm)	218	246	255	256	260	262	268	269	281	282	291	294	294
	303	305	305	306	309	311	312	346					

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Station Name and Code: Ventura to Rincon, 40124VTRC (Zone 24)

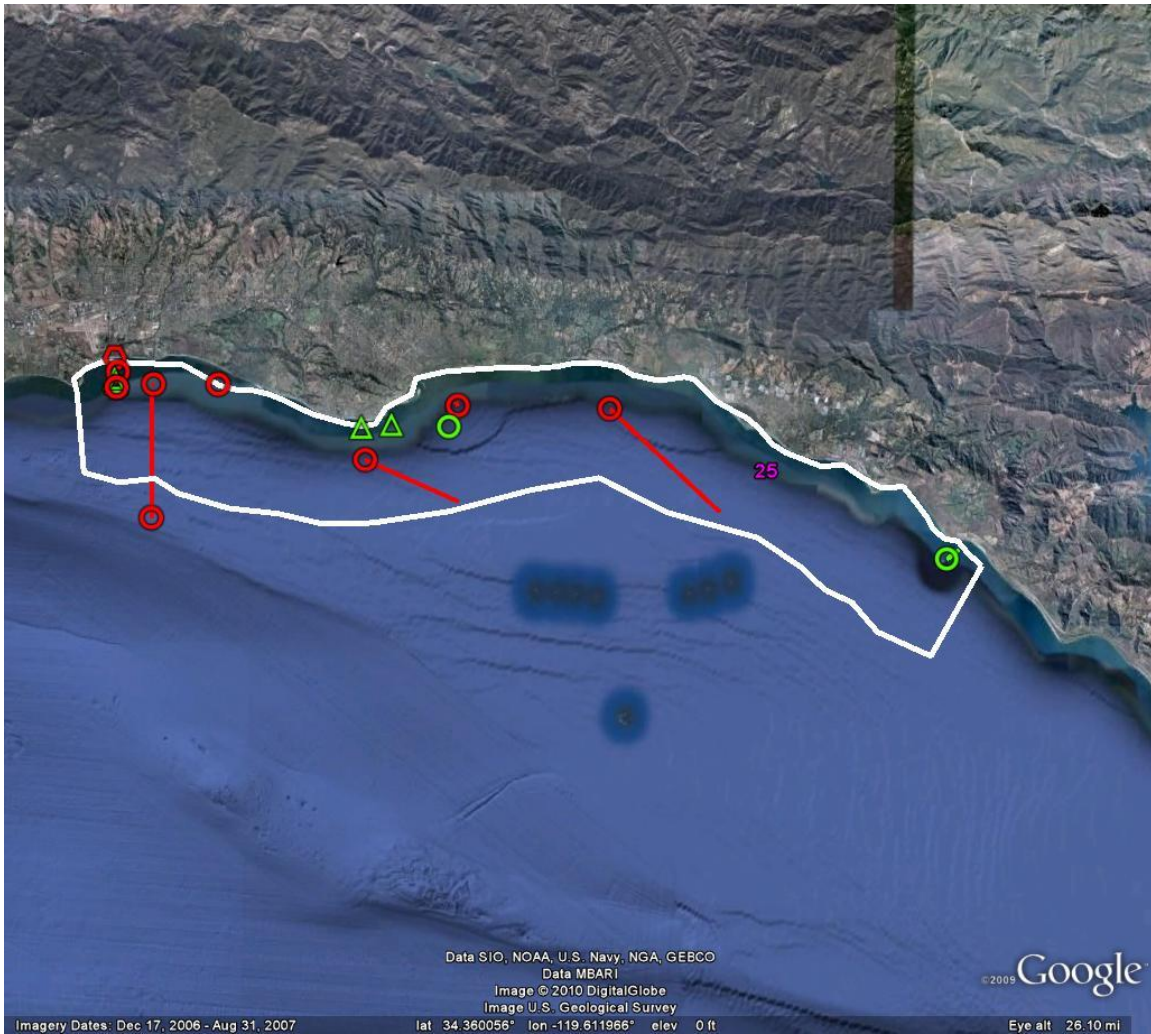
Date (s) of Collection: July 23, 27, 30, August 5, 10, Nov 2, 2009

Collection Method: Hook and Line, Beach Seine, Otter Trawl

Fish Collected:

Brown Rockfish (n=1)		Treefish (n=1)		Starry Rockfish (n=1)									
TL (mm)	250	TL (mm)	253	TL (mm)	301								
White Croaker (n=18)													
TL (mm)	167	171	178	180	185	185	186	187	193	195	197	197	198
	210	215	216	225	236								
Barred Surfperch (n=10)				Shiner Surfperch (n=30)									

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Station Name and Code: Rincon to Goleta, 31525RCGA (Zone 25)

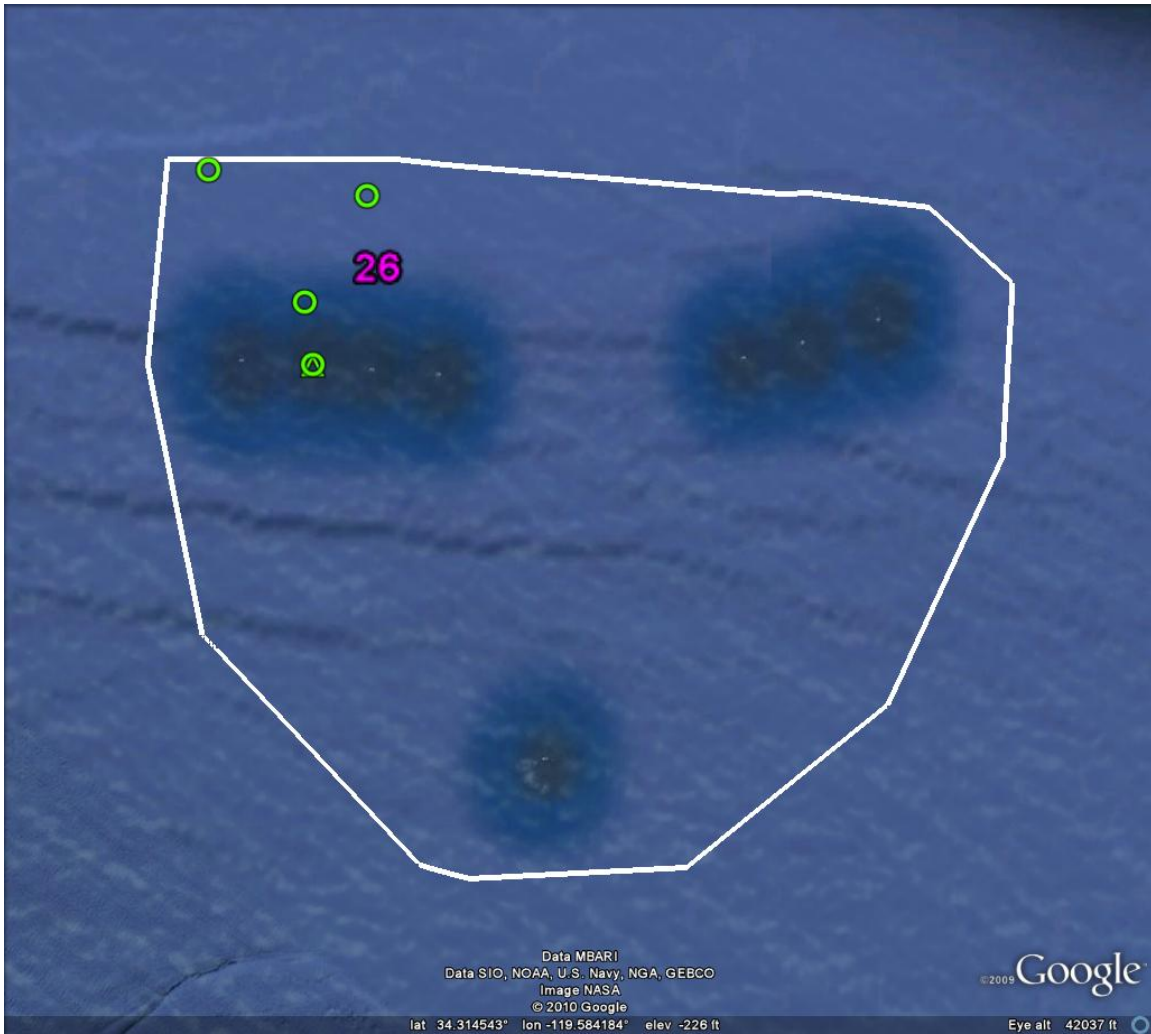
Date (s) of Collection: August 5, 12, 13, 24, 25, 26, Oct 28, Nov 3, 4, 2009

Collection Method: Hook and Line, Spear, Beach Seine, Gill net

Fish Collected:

Olive Rockfish (n=3)																
TL (mm)	275	284	323													
Blue Rockfish (n=4)																
TL (mm)		224	227	228	289						Black Perch (n=5)					
Brown Rockfish (n=6)																
TL (mm)	310	316	335	339	381	382						White Surfperch (n=6)				
Pile Surfperch (n=10)																
TL (mm)	204	255	285	295	305	335	335	340	345	360						
Kelp Bass (n=13)																
TL (mm)		274	275	292	310	310	320	324	325	326	330	335	344	364		
Kelp Rockfish (n=15)																
TL (mm)		270	270	270	285	285	290	295	300	305	310	315	334	335	338	
		355														
Chub Mackerel (n=15)			White Croaker (n=17)													

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Station Name and Code: Santa Barbara Channel Oil Platform, 31526BCP (Zone 26)

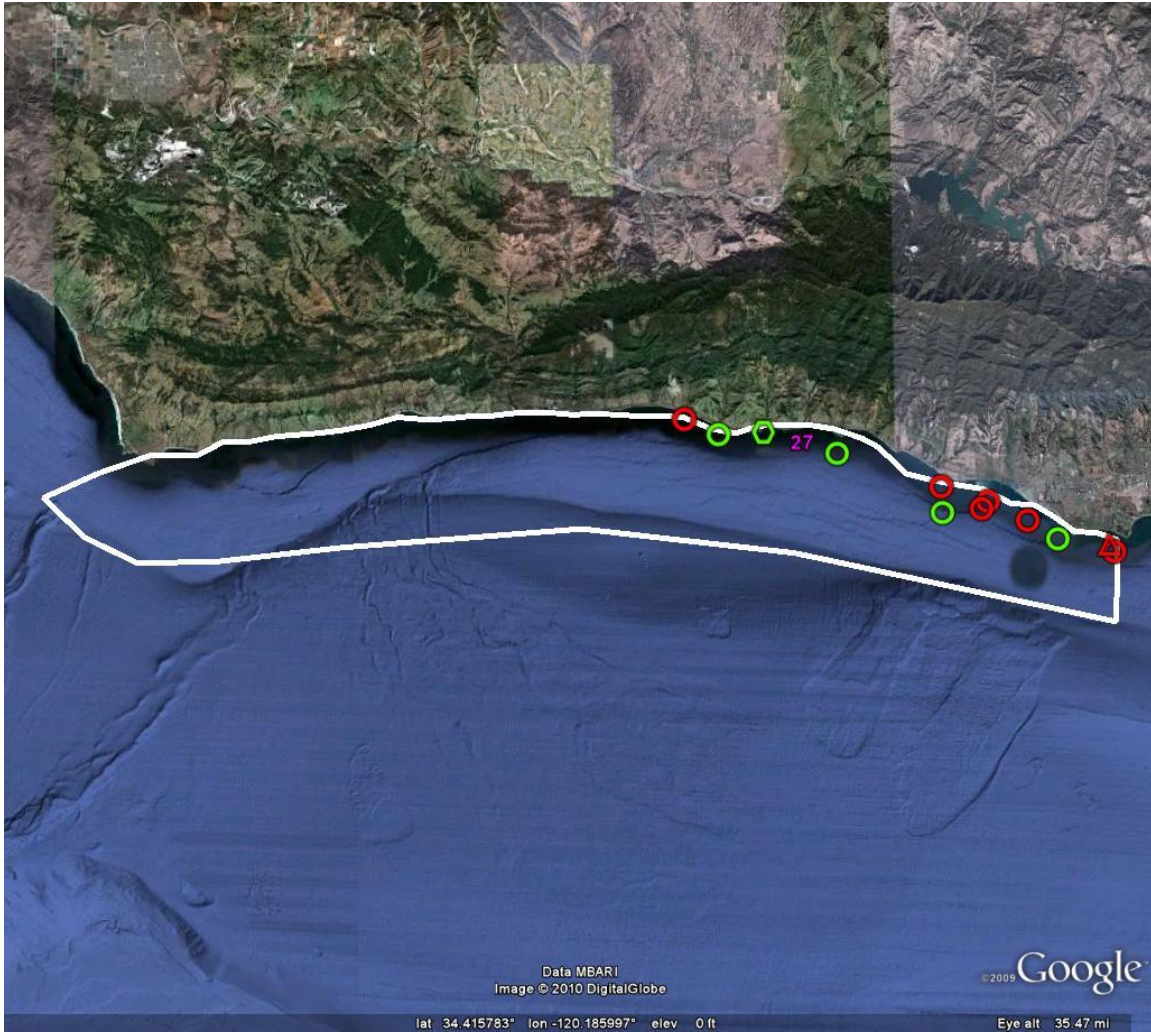
Date (s) of Collection: August 25, Oct 26, November 2, 2009

Collection Method: Hook and Line, Spear

Fish Collected:

Kelp Rockfish (n=2)													
TL (mm)	275		353										
Treefish (n=4)													
TL (mm)	243	276	292	310									
Pile Surfperch (n=6)							Kelp Bass (n=6)						
TL (mm)	250	290	305	315	315	320	TL (mm)	305	322	323	376	376	403
Brown Rockfish (n=9)													
TL (mm)	221	226	235	240	250	275	290	300	317				
Chub Mackerel (n=21)			Blacksmith (n=12)				Gopher Rockfish (n=6)						
Grass Rockfish (n=3)			Starry Rockfish (n=4)				White Croaker (n=17)						
White Surfperch (n=13)													

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Station Name and Code: Goleta to Pt Conception, 31527GPTC (Zone 27)

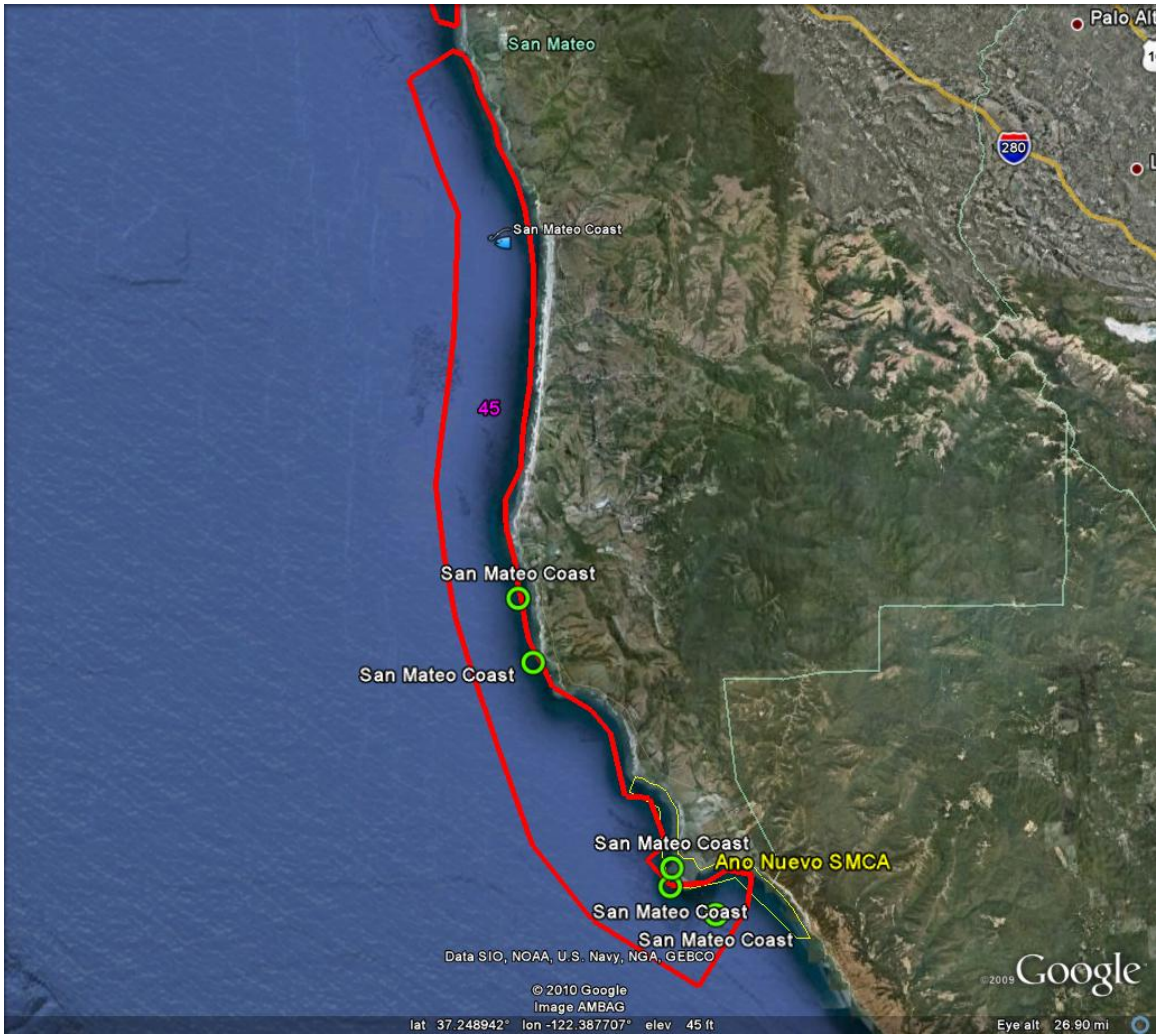
Date (s) of Collection: August 12, 24, 26, Oct 27, 28, Nov 3, 4, 2009

Collection Method: Hook and Line, Spear, Beach Seine, Gill net

Fish Collected:

Redtail Surfperch (n=1)											
TL (mm)	200										
Barred Surfperch (n=4)					Kelp Bass (n=4)						
TL (mm)	178	184	200	202	TL (mm)	270	281	302	327		
Barred Sand Bass (n=11)											
TL (mm)	306	310	310	342	342	345	365	380	386	454	468
Black and Yellow Rockfish (n=20)				Blue Rockfish (n=5)				Gopher Rockfish (n=10)			
Brown Rockfish (n=13)			Chub Mackerel (n=15)			Copper Rockfish (n=10)			Kelp Rockfish (n=17)		
White Croaker (n=2)											

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Station Name and Code: San Mateo Coast, 20245SMAT (Zone 45)

Date (s) of Collection: Jul 27-30, Aug 20, 2009

Collection Method: Hook and Line

Fish Collected:

Black Rockfish (n=5)										
TL (mm)	302	310	325	341	368					
Blue Rockfish (n=5)										
TL (mm)	215	250	257	260	267					
Olive Rockfish (n=5)										
TL (mm)	310	315	319	322	405					
Gopher Rockfish (n=9)										
TL (mm)	258	270	280	282	282	287	291	293	311	

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Station Name and Code: Pillar Point Harbor, 20246PPTH (Zone 46)

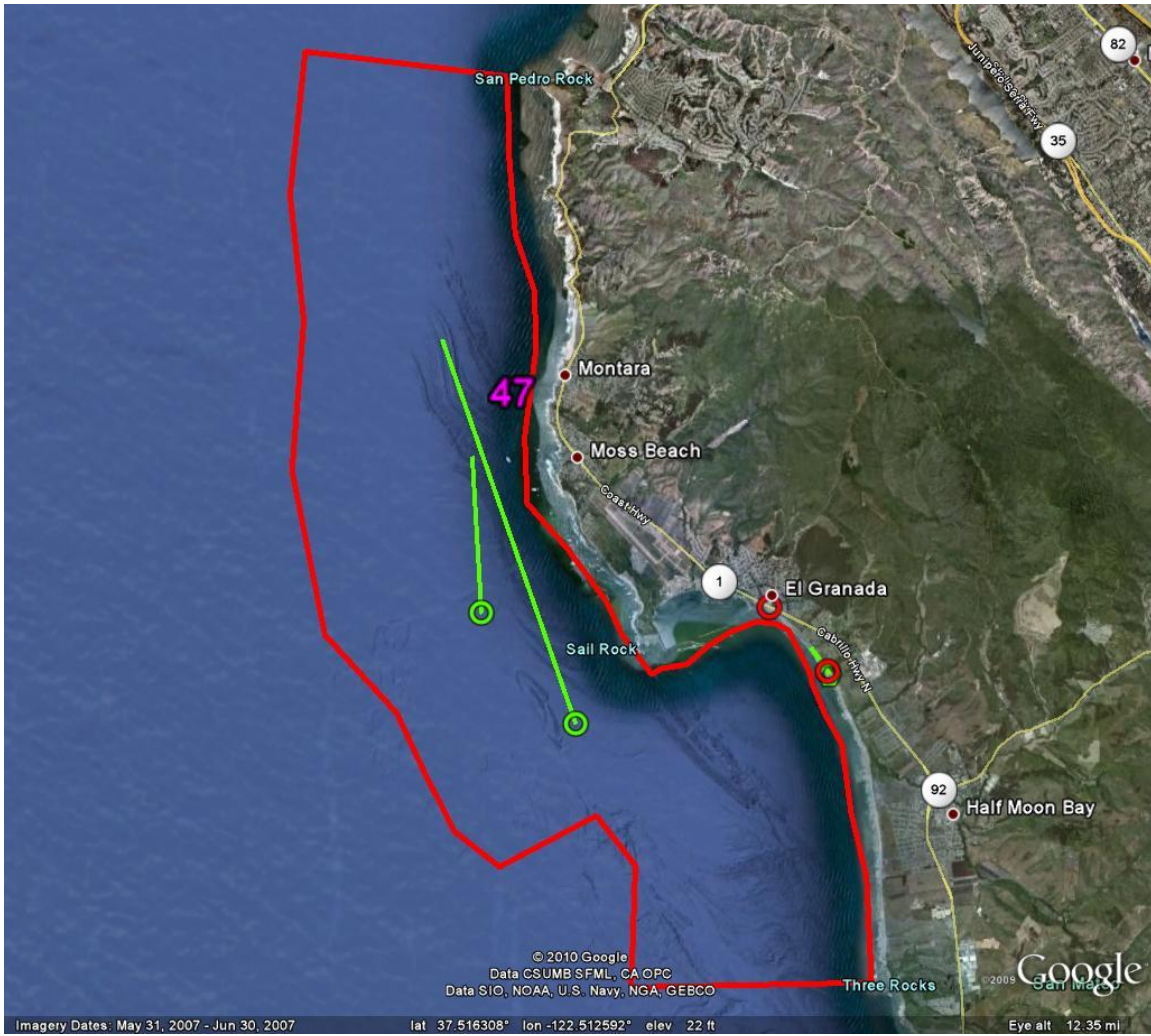
Date (s) of Collection: Sep 23, 24, 2009

Collection Method: Hook and Line, Cast net, Otter Trawl

Fish Collected:

Brown Smooth-hound Shark (n=1)		
TL (mm)	720	
Black Perch (n=6)	Rainbow Surfperch (n=4)	Shiner Surfperch (n=29)
Top Smelt (n=11)	White Croaker (n=10)	White Surfperch (n=7)

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Station Name and Code: Half Moon Bay Coast, 20247HMBC (Zone 47)

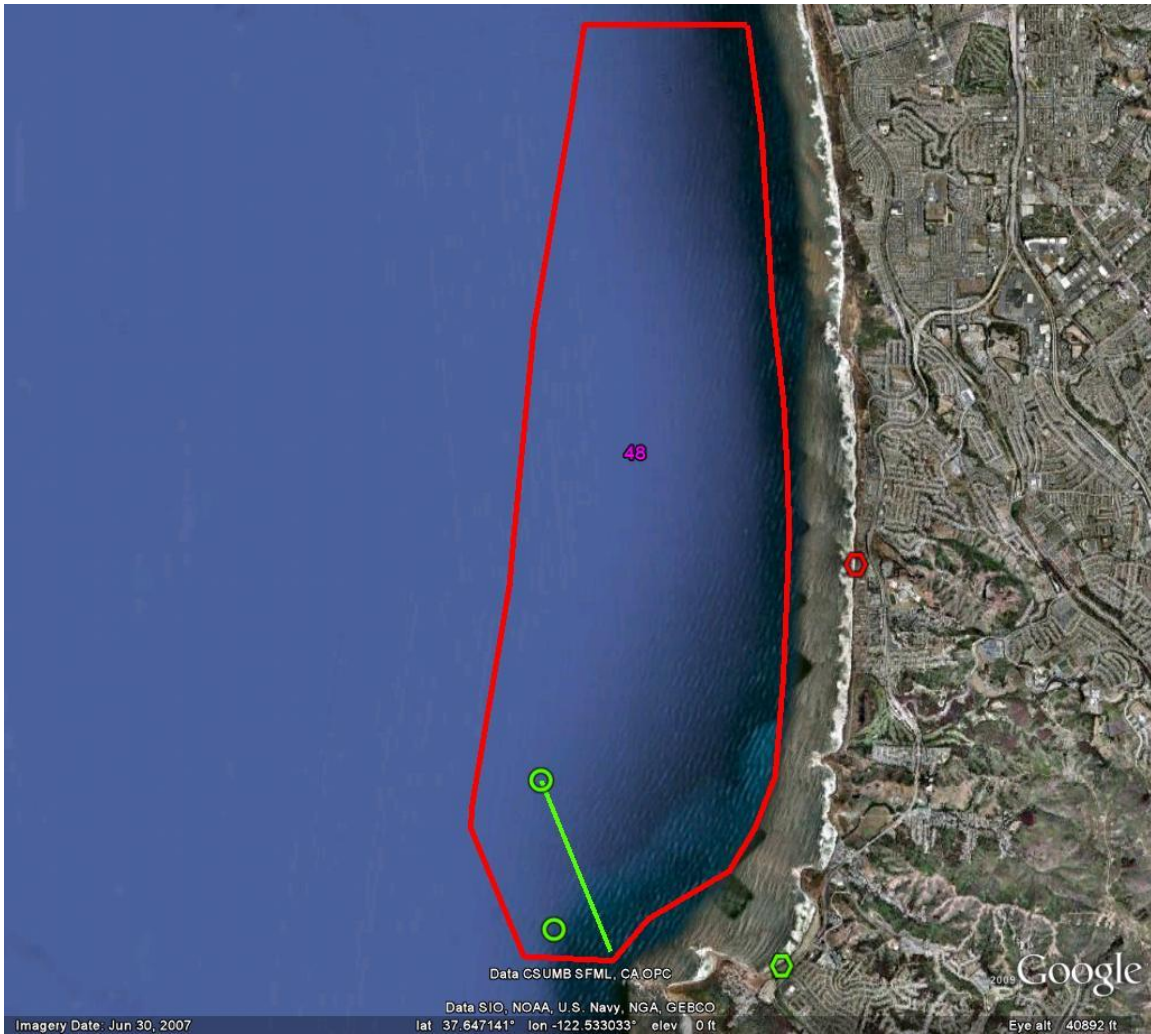
Date (s) of Collection: May 12, June 2, Aug 20, Sep 21, 2009

Collection Method: Hook and Line, Beach Seine

Fish Collected:

Black Rockfish (n=1)			White Surfperch (n=1)			Copper Rockfish (n=2)					
TL (mm)	369		TL (mm)	181		TL (mm)	330	382			
Brown Rockfish (n=3)				Lingcod (n=4)							
TL (mm)	324	368	392	TL (mm)	610	615	671	735			
Blue Rockfish (n=6)											
TL (mm)	251	270	280	305	343	370					
China Rockfish (n=7)											
TL (mm)	253	271	273	285	302	306	320				
Gopher Rockfish (n=10)											
TL (mm)	258	275	290	295	295	297	298	299	305	305	
Barred Surfperch (n=11)											
TL (mm)	181	190	243	248	249	250	255	274	290	300	363

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Station Name and Code: Pacifica Coast, 20248PACC (Zone 48)

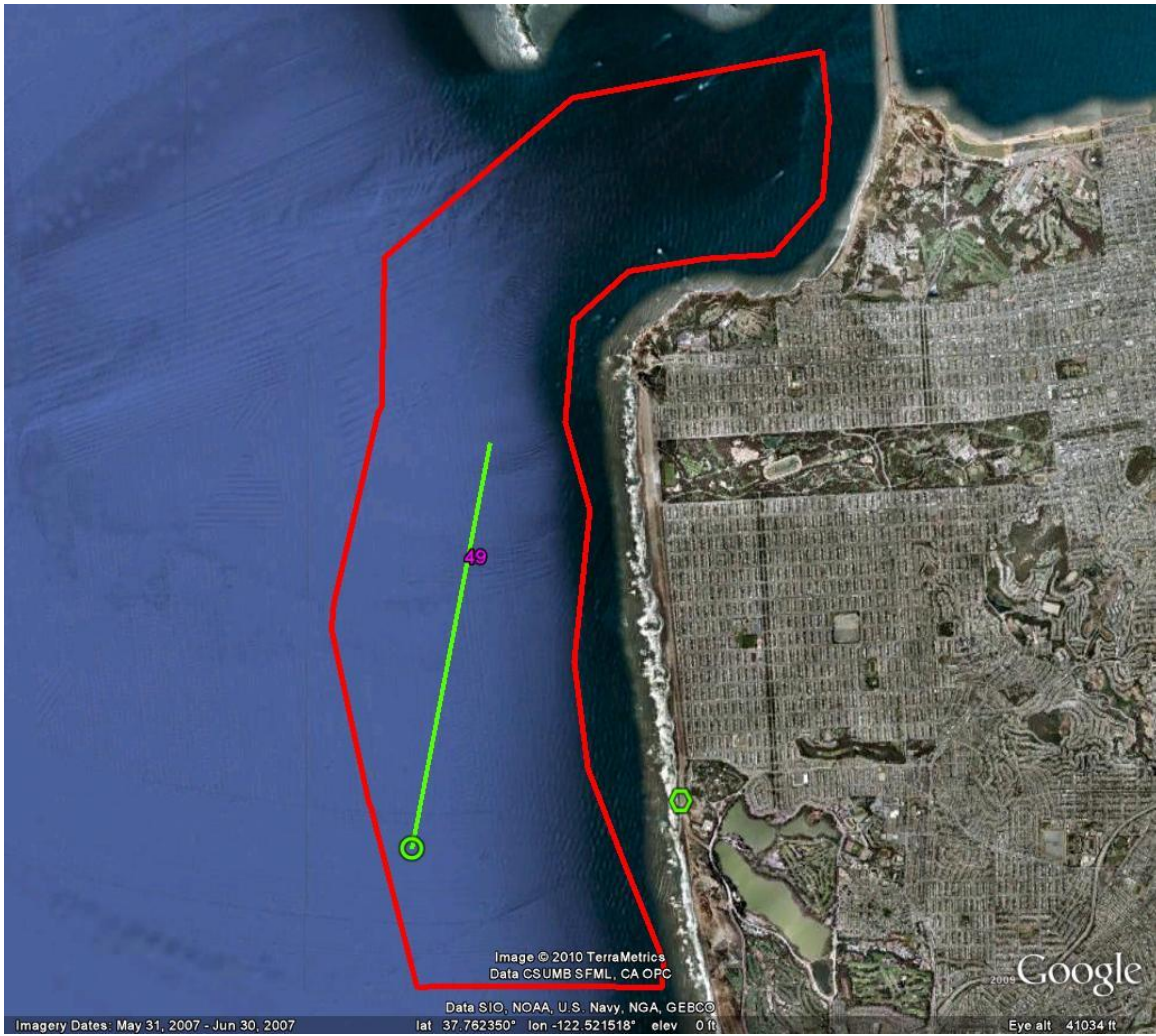
Date (s) of Collection: July 2, Sep 22, 23, 2009

Collection Method: Hook and Line, Beach Seine

Fish Collected:

China Rockfish (n=3)								
TL (mm)	292	317	350					
Copper Rockfish (n=1)								
TL (mm)				392				
Blue Rockfish (n=3)								
TL (mm)	346	360	395					
Silver Surfperch (n=5)								
TL (mm)	209	215	220	228	229			
Gopher Rockfish (n=8)								
TL (mm)	280	285	285	301	308	310	310	320
Lingcod (n=4)								
TL (mm)	360	654	720	822				

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Station Name and Code: San Francisco Coast, 20249SSFC (Zone 49)

Date (s) of Collection: July 2, Oct 6, 2009

Collection Method: Hook and Line, Beach Seine

Fish Collected:

Barred Surfperch (n=5)					
TL (mm)	152	209	210	210	212
White Croaker (n=17)					

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Station Name and Code: Farallon Islands, 20150FARI (Zone 50)

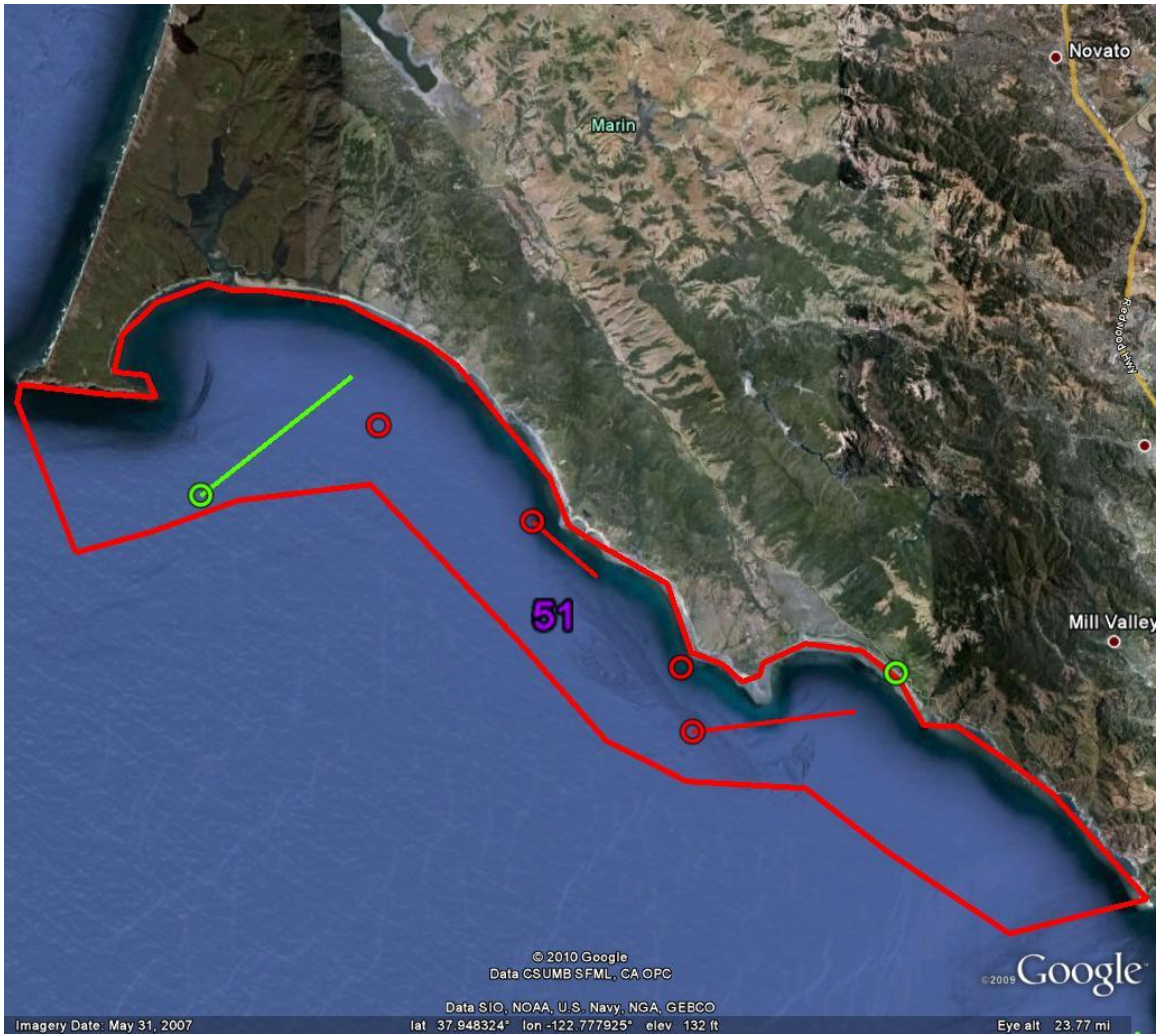
Date (s) of Collection: Sep 14, 2009

Collection Method: Hook and Line

Fish Collected:

Gopher Rockfish (n=5)						
TL (mm)	300	301	305	320	323	
Blue Rockfish (n=6)						
TL (mm)	216	216	220	270	275	281
Olive Rockfish (n=6)						
TL (mm)	342	352	380	381	395	405

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Station Name and Code: Southern Marin Coast, 20151SMAC (Zone 51)

Date (s) of Collection: Sep 1, Oct 5, 2009

Collection Method: Hook and Line

Fish Collected:

Barred Surfperch (n=8)								
TL (mm)	154	164	210	214	220	221	225	243
White Croaker (n=16)								

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Station Name and Code: Tomales Bay, 20152TBAY (Zone 52)

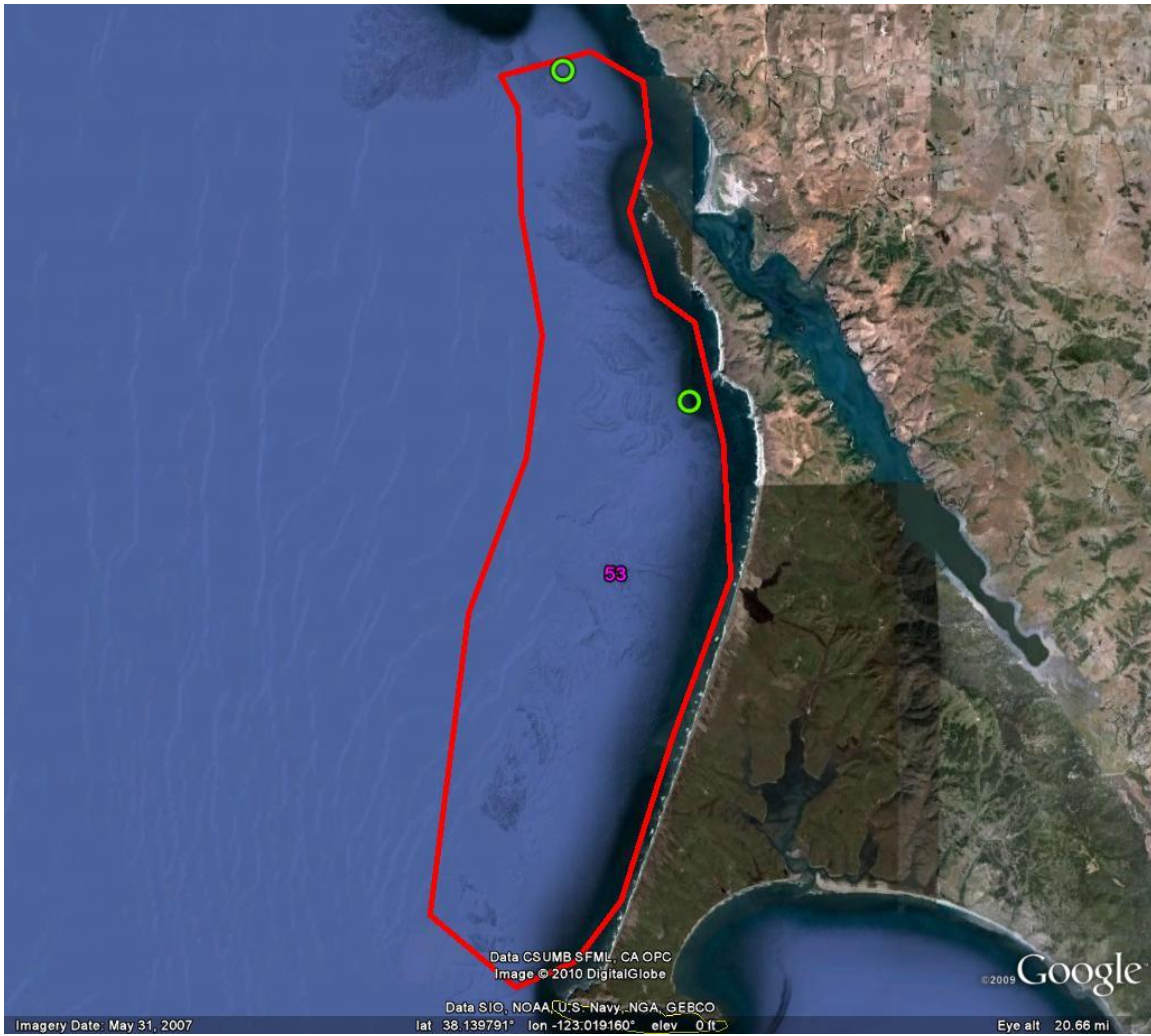
Date (s) of Collection: Sep 16-17, 2009

Collection Method: Gillnets, Hook and Line, Otter Trawl

Fish Collected:

White Seabass (n=1)									
TL (mm)	1334								
Brown Smooth-hound Shark (n=4)									
TL (mm)	826	839	842	851					
Leopard Shark (n=9)									
TL (mm)	1027	1084	1097	1156	1184	1207	1214	1219	1224
Shiner Surfperch (n=24)				Top Smelt (n=6)			White Surfperch (n=14)		

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Station Name and Code: Northern Marin Coast, 20153NMRC (Zone 53)

Date (s) of Collection: Sep 6, 15, 2009

Collection Method: Hook and Line

Fish Collected:

China Rockfish (n=1)										
TL (mm)	264									
Brown Rockfish (n=10)										
TL (mm)	246	259	272	286	294	302	304	304	319	323
Olive Rockfish (n=10)										
TL (mm)	208	209	216	264	276	276	284	284	299	299
Rosy Rockfish (n=9)	Blue Rockfish (n=3)									

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