

## Overall Conclusions

The NERRS, NMSP, and SERC together developed a large-scale monitoring program for invasive species in marine protected areas along the west coast. The long-term intent of this program was to expand geographically to link all of NERRS and NMSP sites as well other US marine protected areas in order to support a national network of coordinated invasive species monitoring and research in coastal ecosystems. We are now ready to expand our sampling to include interannual sampling and to include these other protected coastal areas. We plan to adapt and increase sampling coverage over time and space to address both management and larger research questions, including measuring responses to changes in transport vectors (e.g., shipping patterns, ballast water treatment, fishery stock management and aquaculture) and large ecosystem changes (e.g., weather and oceanographic patterns, and human-mediated disturbance, such as freshwater usage, pollution, dredging).

While we have laid the groundwork for future studies, we have also already produced results useful for habitat managers and for testing research hypotheses. This study already identified five new range expansions, including two new US West Coast introductions. We found a strong pattern of decreasing number and percent of NIS with increasing latitude. A high number and proportion of Tunicata and Bryozoan species were nonindigenous, and both these taxa separately followed the same latitudinal pattern seen for all NIS together. We also found that NIS in non-marina sites, estuaries and bay sites in more natural habitats, almost entirely overlapped with those in marina sites but not vice versa, and marinas were more heavily invaded than these other sites. Offshore buoys had no NIS. We also collected samples that will allow us to test the pattern of NIS across a salinity gradient, interannual variation in NIS, and the role of flow and distance into an estuary.

While it was essential to use uniform protocols in order to gather quantitative data to determine spatial, temporal, and taxonomic patterns of invasion, the Olympic Coast Sanctuary site-specific project highlighted the importance of using multiple survey methods to create complete species lists of NIS. Olympic Coast rapid assessment study produced a list of NIS that barely overlapped with the list from this study. The list of overlapping species should increase from 2 when more taxonomic identifications are conducted on our settling plates. Nonetheless, both studies will still have noted species missing from the other.

The information from the broad-scale project is available to the managers and research coordinators of these protected areas via a web-accessible database. This information will be updated and available as more taxa are identified to species. Hence, managers of the protected areas can know which sites in and near their reserves harbor NIS and which NIS are widespread. In addition, the data on where NIS were present and missing will enable us to track the range limits and, given future sampling, the spread of NIS.

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## Appendices

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OC-B. Nearshore survey sites sampled 27 June 2002 (north to south).

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Table 1. Sites in west coast Reserves and Sanctuaries, from south to north, and how we sampled them (geographic coordinates, year, # plates retrieved, # traps retrieved).

SWMP = System-wide water monitoring program stations of the NERRS (WM = other in-estuary regular water monitoring).

Waterway	Site type	Site	Latitude (°N)	Longitude (°W)	Year	# Plates	# Traps
<b>Tijuana River NERR</b>	SWMP	Model Marsh	32.55972	117.10655	2003	6	7
	SWMP	Oneonta Slough	32.56780	117.13153		6	7
	SWMP	Tidal Linkage	32.57420	117.12695		1	7
	SWMP	Tijuana R. Main Channel	32.55972	117.10655		1	8
	Marina	Mission Bay, Dana Point	32.76753	117.23647		6	
	Marina	Mission Bay, Seaforth	32.76302	117.23726		6	
	Marina	SD Bay, Sunroad	32.72625	117.19217		5	
	Marina	SD Bay, Chula Vista	32.62439	117.10376		6	
<b>Channel Is NMS</b>	Buoy	Alegria (PISCO)	34.46175	120.29003	2004	2	
	Buoy	Arguello (PISCO)	34.54685	120.60883		2	
	Buoy	Ellwood (PISCO)	34.42485	119.93163		2	
	Buoy	Jalama (PISCO)	34.47385	120.48605		2	
	Buoy	Point Sal (PISCO)	34.86982	120.63535		2	
	Buoy	Purisima Point (PISCO)	34.72648	120.62680		2	
	Marina	Oxnard, Vintage	34.17153	119.22884		9	
	Marina	Ventura West Harbor	34.24638	119.26110		9	
<b>Monterey Bay NMS</b>	Buoy	Pt Sur (PISCO)	36.27563	121.87194	2003	1	
	Buoy	Sandhill Bluff (PISCO)	36.97292	122.15773		1	
	Buoy	Soquel Pt (PISCO)	36.93867	121.97547		1	
	Buoy	Stillwater Beach (PISCO)	36.55905	121.94479		1	
	Buoy	Stillwater Cove (PISCO)	36.55893	121.94477		1	
	Buoy	Terrace Pt (PISCO)	36.94417	122.13293		1	
	Marina	Monterey	36.60915	121.89203		5	
	Marina	Santa Cruz	36.96580	122.00163		6	
<b>Elkhorn Slough NERR</b>	SWMP	Azevedo Pond	36.84573	121.75358	2003	3	8
	SWMP	North Marsh	36.83463	121.73843		3	8
	SWMP	South Marsh Restoration	36.81808	121.73963		1	
	SWMP	Vierra	36.81110	121.77827		4	8
	WM	Hudson Landing West	36.85673	121.75495		3	8
	In estuary	Hummingbird Island	36.82372	121.74278		6	8
	In estuary	Kirby Park	36.84103	121.74630		6	7
	In estuary	Whistle Stop Lagoon	36.82397	121.73938		3	8
Marina	Moss Landing	36.80022	121.78719	12			
<b>Gulf of Farallones NMS</b>	Buoy, in bay	Tomales Bay, Clark	38.18101	122.91047	2004	1	
	Buoy, in bay	Tomales Bay, Duck Cove	38.14000	122.89000		1	
	Buoy, in bay	Tomales Bay, Marshall	38.14969	122.88853		1	
	Buoy, in bay	Tomales Bay, Nick's Cove	38.20103	122.92281		1	
	Buoy, in bay	Tomales Bay, Shell Beach	38.11473	122.86944		1	
	Buoy, in bay	Tomales Bay, Thomas Stn	38.12865	122.86539		1	
	Buoy, in bay	Tomales Bay, Tomales Beach	38.17558	122.92336		1	
	Float & Pier	Tomales Bay, Miller Park	38.19956	122.92168		4	
	Float & Pier	Tomales Bay, Sacramento Landing	38.15035	122.90575		4	
	Marina	Bodega Bay, Mason's	38.33207	123.05880		5	
Marina	Bodega Bay, Porto Bodega	38.33440	123.05263	6			

Waterway (cont'd)	Site type	Site	Latitude (°N)	Longitude (°W)	Year	# Plates	# Traps	
<b>South Slough NERR</b>	SWMP, Pier, Float	Charleston Bridge	43.33768	124.32055	2003	1		
					2004	7		
	SWMP, Piling	Coast Guard Beach	43.34932	124.32477	2004	10		
	SWMP, Piling	Sengstacken	43.31738	124.32173	2003	1		
	SWMP, Piling, Frame	Valino Island/Crown Point		43.31665	124.32135	2003	1	7
						2004	10	
	SWMP, Piling, Frame	Winchester		43.31738	124.32173	2003	1	
						2004	10	
	In estuary	Brown's Cove		43.32692	124.32513	2003	0	7
	In estuary	Sengstacken Arm		43.30135	124.31583	2003	5	7
	In estuary	Winchester arm		43.30190	124.31945	2003	5	6
	Marina	Charleston Boat Basin		43.34650	124.32665	2003	5	
	Pier	Empire boat ramp		43.39330	124.28117	2003	6	
2004						5(10)		
Pier	Port of Coos Bay Citrus		43.38225	124.21927	2004	6		
<b>Olympic Coast NMS</b>	Buoy	Outer Coast, Cape Alava	48.16613	124.80405	2004	2		
	Buoy	Outer Coast, Kalalock	47.59418	124.49460	2004	2		
	Buoy	Outer Coast, Makah Bay	48.32305	124.73953	2004	2		
	Buoy	Outer Coast, Teawhit Head	47.84603	124.62870	2004	2		
	Marina	La Push, Quileute River	47.91112	124.63698	2003	6		
	Marina	Neah Bay, Makah	48.36770	124.61157	2003	6		
<b>Padilla Bay NERR</b>	2 SWMP, buoy	Gong (high + low)	48.55895	122.57300		2		
	SWMP, Piling	Joe Leary, Fresh	48.51802	122.47443		1		
	SWMP	Joe Leary, Marine	48.51808	122.47117		1		
	In estuary	Bayview Channel	48.49607	122.50083	2003	6	8	
	In estuary	Middle Channel	48.53332	122.52907		0	6	
	In estuary	Ploug Channel	48.55483	122.52712		6	7	
	Marina	Anacortes, Cap Sante	48.51097	122.60940		4		
	Marina	La Conner	48.39943	122.49403		6		
<b>Kachemak Bay NERR</b>	SWMP, buoy	Bear Point	59.42348	151.06611	2003	2		
	SWMP, buoy	Homer Dolphin	59.36213	151.40892	2003	2		
					2004	1		
	SWMP, buoy	Port Graham	59.22770	151.53834	2003	2		
	SWMP, buoy	Seldovia Pier	59.44071	151.72101	2003	2		
					2004	1		
	In estuary	Halibut Cove	59.59478	115.24695	2004	1		
	Harbor piling	Homer pilings	59.60294	151.41728	2003	5	8	
	Harbor piling	Seldovia pilings	59.43695	151.71367	2003	6		
	Marina	Homer Harbor		59.60605	151.93063	2003	5	
						2004	5	
Marina	Seldovia Harbor		59.43718	151.71671	2003	6		
					2004	5		



Table 2. Species found on plates in each Reserve or Sanctuary. Species are listed alphabetically within each class, and confirmed nonindigenous species are noted.

<b>TAXA</b>	<b>Sites (from south to north)<sup>1</sup></b>									
<b>Cnidaria, Hydrozoa</b>										
Aequorea sp.							SS	OC		
Aglaophenia sp.	TR									
Aglaophenia struthionides	TR									
Athecata										KB
Bougainvillia sp.	TR									
Bougainvilliidae				ES	GF					
Calycella syringa		CI					SS	OC		KB
Campanulariidae	TR	CI	MB	ES	GF		SS	OC	PB	KB
Campanulinidae			MB	ES	GF		SS	OC		KB
Clytia hemisphaerica							SS		PB	
Clytia sp.	TR			ES			SS	OC	PB	KB
Corynidae		CI	MB							KB
Cuspidella sp.										KB
Ectopleura crocea NIS							SS			
Ectopleura dumortierii							SS			
Endothecium sp.	TR									
Eudendrium sp.								OC	PB	
Gonothyraea clarki										KB
Gonothyraea sp.									PB	KB
Laomedea sp.							SS		PB	
Obelia dichotoma							SS	OC		KB
Obelia longissima	TR	CI	MB	ES	GF		SS	OC	PB	KB
Obelia sp.	TR	CI		ES	GF		SS	OC	PB	KB
Opercularella lacerata				ES			SS			KB
Opercularella sp.					GF		SS			
Perigonimus repens							SS	OC		
Plumularia lagenifera		CI						OC		
Plumularia sp.								OC		
Sarsia eximia		CI								
Sarsia tubulosa										KB
Thecata	TR						SS			
Tubularia sp.							SS			
Tubulariidae					GF		SS			
<b>Totals</b>	<b>Coast</b>	<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>	<b>GF</b>	<b>SS</b>	<b>OC</b>	<b>PB</b>	<b>KB</b>
Max # species <sup>2</sup>	33	9	7	4	7	7	18	12	8	14
Min # species <sup>3</sup>	20	5	4	2	4	4	11	9	5	8
# Named species <sup>4</sup>	13	2	4	1	2	1	8	5	2	6
# NIS <sup>5</sup>	1	0	0	0	0	0	1	0	0	0
% NIS <sup>6</sup>	7.7	0.0	0.0	0.0	0.0	0.0	12.5	0.0	0.0	0.0

**Mollusca, Gastropoda Nudibranchia**

Cumanotus sp.									PB	
Cuthona albocrusta	TR									
Cuthona concinna										KB
Cuthona pustulata										KB
Dendronotus frondosus			MB		ES	GF	SS	OC	PB	KB
Dirona picta						GF				
Doto form A		CI								
Doto kya								OC		
Doto sp.			MB							
Eubranchus rupium									PB	KB
Eubranchus rustyus		CI						OC		
Flabellina japonica										KB
Flabellina trilineata		CI								
Hermisenda crassicornis	TR	CI				GF	SS	OC	PB	
Janolus fuscus							SS			
Onchidoris bilamellata							SS			
Palio zosteriae							SS			
Stiliger sp.							SS			
Tenellia adspersa					ES					
Triopha catalinae			MB							
<b>Totals</b>	<b>Coast</b>	<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>	<b>GF</b>	<b>SS</b>	<b>OC</b>	<b>PB</b>	<b>KB</b>
Max # species	20	2	4	3	2	3	6	4	4	5
Min # species	19	2	4	3	2	3	6	4	4	5
# Named species	17	2	4	2	2	3	5	4	3	5
# NIS	1	0	0	0	1	0	0	0	0	0
% NIS	5.9	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	0.0

**Crustacea, Cirripedia**

Balanidae										KB
Balanus amphitrite	NIS	TR	CI							
Balanus balanus						GF	SS	OC		
Balanus crenatus			CI	MB	ES	GF	SS	OC	PB	KB
Balanus glandula		TR					SS	OC	PB	KB
Balanus improvisus	NIS, R.E. <sup>7</sup>	TR					SS	OC	PB	
Balanus reticulatus	NIS, R.E.*	TR								
Balanus sp.			CI			GF	SS	OC		
Balanus trigonus		TR								
Chthamalus dalli						GF				
Chthamalus sp.		TR								
Lepas antiferia				MB						
Lepas pectinata pacifica				MB						
Lepas sp.				MB						
Megabalanus californicus			CI							
Megabalanus sp.			CI							
<b>Totals</b>	<b>Coast</b>	<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>	<b>GF</b>	<b>SS</b>	<b>OC</b>	<b>PB</b>	<b>KB</b>
Max # species	16	6	5	4	1	4	5	5	3	3
Min # species	11	6	3	3	1	3	4	4	3	2
# Named species	11	5	3	3	1	3	4	4	3	2
# NIS	3	3	1	0	0	0	1	1	1	0
% NIS	27.3	60.0	33.3	0.0	0.0	0.0	25.0	25.0	33.3	0.0

<b>Urochordata, Ascidiacea</b>										
Aplidium californicum		TR								
Aplidium sp.			CI							
Aplidium sp.A			CI							
Aplousobranchia							GF			
Ascidia ceratodes		TR	CI				GF			
Ascidia sp.		TR	CI	MB			GF			KB
Ascidia sp. B			CI				GF			
Ascidia zara <b>NIS</b>		<b>TR</b>	<b>CI</b>		<b>ES</b>		<b>GF</b>			
Botryllidae			CI				GF			
Botrylloides diegensis		TR			ES					
Botrylloides perspicuum <b>NIS</b>		<b>TR</b>								
Botrylloides sp.			CI				GF			PB
Botrylloides violaceus <b>NIS</b>		<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>		<b>GF</b>	<b>SS</b>	<b>OC</b>	<b>PB</b>
Botryllus schlosseri <b>NIS</b>		<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>		<b>GF</b>	<b>SS</b>	<b>OC</b>	<b>PB</b>
Ciona intestinalis <b>NIS</b>		<b>TR</b>	<b>CI</b>	<b>MB</b>			<b>GF</b>			
Ciona savignyi <b>NIS</b>		<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>					
Ciona sp.					ES		GF			
Corella inflata									OC	PB
Corella sp.									OC	
Corella willmeriana									OC	PB
Didemnum sp. A <b>NIS</b>					<b>ES</b>		<b>GF</b>			
Diplosoma listerianum <b>NIS</b>		<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>		<b>GF</b>		<b>OC</b>	
Distaplia occidentalis		TR	CI		ES		GF	SS	OC	KB
Distaplia sp.		TR								KB
Molgula manhattensis <b>NIS</b>			<b>CI</b>	<b>MB</b>			<b>GF</b>			<b>PB</b>
Molgula pugetiensis								SS		KB
Molgula sp.		TR						SS		KB
Molgula sp. A <b>NIS</b>		<b>TR</b>								
Perophora annectens		TR					GF		OC	
Polyandrocarpa zorrutensis <b>NIS</b>		<b>TR</b>								
Stolidobranchia			CI						OC	
Styela clava <b>NIS</b>		<b>TR</b>	<b>CI</b>							
Styela plicata <b>NIS, R.E.</b>		<b>TR</b>	<b>CI</b>		<b>ES</b>					
Styela sp.		TR	CI	MB			GF		OC	PB
Styela truncata							GF			
Styelidae		TR			ES					
Symplegma reptans <b>NIS</b>		<b>TR</b>								
<b>Totals</b>	<b>Coast</b>	<b>TR</b>	<b>CI</b>	<b>MB</b>	<b>ES</b>	<b>GF</b>	<b>SS</b>	<b>OC</b>	<b>PB</b>	<b>KB</b>
Max # species	37	22	19	8	11	18	5	10	7	5
Min # species	26	17	13	8	10	12	4	8	6	3
# Named species	26	17	13	6	10	12	4	7	5	2
# NIS	14	12	9	6	7	7	2	3	3	0
% NIS	53.8	70.6	69.2	100.0	70.0	58.3	50.0	42.9	60.0	0.0

**Bryozoa**

Alcyonidium sp.			MB		GF	SS	OC		KB
Amathia sp.	TR			ES					
Amathia vidovici				ES					
Bowerbankia aggregata		CI?	MB	ES		SS			
Bowerbankia sp.	TR	CI	MB	ES	GF	SS	OC	PB	KB
Bugula californica		CI			GF				
Bugula fulva <b>NIS, R.E.*</b>		CI	MB						
Bugula longirostrata				ES					
Bugula neritina <b>NIS</b>	TR	CI	MB	ES	GF				
Bugula pacifica					GF	SS	OC	PB	KB
Bugula sp.	TR	CI	MB	ES	GF	SS	OC	PB	
Bugula sp. 1				ES	GF				
Bugula sp. X			MB	ES					
Bugula sp. Y	TR	CI			GF				
Bugula stolonifera <b>NIS</b>		CI	MB	ES	GF				
Buskia seriata				ES					
Callopora craticula									KB
Callopora sp.						SS			KB
Callopora sp. 1							OC		
Caulibugula ciliata						SS			
Celleporaria brunnea	TR	CI	MB		GF				
Celleporaria sp.		CI			GF				
Celleporella hyalina			MB		GF	SS	OC	PB	KB
Celleporina robertsoniae	TR	CI							
Celleporina sp.	TR	CI							
Cheilopora praelonga						SS			
Cheilostomata						SS			
Conopeum osburni				ES	GF	SS			
Conopeum seurati <b>NIS</b>				ES	GF	SS			
Conopeum tenuissimum <b>NIS</b>						SS			
Cribrilina annulata									KB
Cribrilina corbicula							OC	PB	KB
Cribrilina sp.						SS			
Cribrilina sp. 1						SS			
Crisia occidentalis							OC		
Crisia sp.		CI	MB			SS	OC		
Crisulipora occidentalis	TR	CI							
Crisulipora sp.	TR								
Cryptosula pallasiana <b>NIS</b>	TR	CI	MB	ES	GF	SS		PB	
Ctenostomata	TR								
Cyclostomata	TR								
Dendrobeania lichenoides						SS			
Disporella sp.	TR								
Electra crustulenta						SS			
Filicrisia franciscana							OC		
Filicrisia sp.			MB						
Hippopodina feegeensis	TR				GF				
Lichenopora sp. 1	TR								

<b>Bryozoa, continued</b>										
Lichenopora verrucaria										KB
Membranipora sp.?			MB							
Membranipora villosa									PB	
Microporella californica							SS			
Parasmittina sp.							SS			
Parasmittina trispinosa							SS?	OC		
Reteporidae sp.										KB
Schizoporella sp.						GF?			PB	
Schizoporella sp. A	TR									
Schizoporella unicornis NIS			MB	ES	GF		SS		PB	
Scruparia sp.							SS			
Scrupocellaria bertholetti tenuirostris	TR									
Smittinidae sp.						GF				
Smittoidea prolifica	TR			ES			SS			
Tegella aquilirostris										KB
Tegella armifera										KB
Thalamoporella californica	TR	CI								
Thalamoporella sp.	TR									
Tricellaria occidentalis								OC		
Tricellaria ternata								OC		
Tubulipora pacifica	TR									
Tubulipora sp.	TR		MB							
Tubulipora tuba	TR								PB	
Victorella pavida NIS, R.E.	TR				ES					
Watersipora arcuata NIS	TR	CI								
Watersipora subtorquata NIS	TR	CI	MB	ES	GF					
Zoobotryon verticillatum NIS	TR									
<b>Totals</b>	Coast	TR	CI	MB	ES	GF	SS	OC	PB	KB
Max # species	75	28	18	17	18	20	25	13	10	12
Min # species	56	21	14	15	15	17	20	11	8	11
# Named species	43	15	12	9	13	12	15	8	7	8
# NIS	11	6	6	6	7	6	4	0	2	0
% NIS	25.0	40.0	50.0	66.7	53.8	50.0	28.6	0.0	28.6	0.0

### All Taxa Combined

<b>Totals</b>	Coast	TR	CI	MB	ES	GF	SS	OC	PB	KB
Max # species	181	67	53	36	39	52	59	44	32	39
Min # species	132	51	38	31	32	39	45	36	26	29
# Named species	110	41	36	21	28	31	36	28	20	23
# NIS	30	21	16	12	15	13	8	4	6	0
% NIS	27.0	51.2	44.4	57.1	53.6	41.9	22.9	14.3	30.0	0.0
# plates retrieved	313	37	30	17	41	26	73	20	26	43
# plates with these taxa	298	37	29	16	37	26	69	20	26	38
# non-marina plates	157	14	12	6	29	7	54	8	16	22

### Notes:

- 1: **TR** = Tijuana River NERR; **CI** = Channel Islands NMS; **MB** = Monterey Bay NMS;  
**ES** = Elkhorn Slough NERR; **GF** = Gulf of Farallones NMS; **SS** = South Slough NERR;  
**OC** = Olympic Coast NMS; **PB** = Padilla Bay NERR; **KB** = Kachemak Bay NER

When a species was found on plates at NERRS YSI Datasondes and other in-reserve sites that were

not marinas, the Reserves and Sanctuaries are in *italix* in the table; when the species is an NIS, the Reserve/Sanctuary initials are **bolded**.

2. Maximum number of speices per Reserve or Sanctuary on the plates
- 3: Minimum number of different species per Reserve or Sanctuary on the plates
- 4: Number of named, described (recorded?) species identified to the species level in this study
- 5: Minimum number of nonindigenous species per Reserve or Sanctuary
- 6: Percent nonindigenous species, as calculated by (minimum # NIS ÷ # named species \* 100)
- 7: R.E. = Range extension; R.E.\* = New record for US West Coast

Table 3. The origin and arrival of the NIS found in our survey.

<b>Taxonomy</b>	<b>Species</b>	<b>Origin</b>	<b>1<sup>st</sup> West Coast date</b>	<b>1st West Coast location</b>	<b>Probable vector to West Coast</b>
Hydrozoa	<i>Ectopleura crocea</i>	NW Atlantic?	1865	CA/ San Diego Bay	Shipping (Hull Fouling)
Serpulidae	<i>Ficopomatus enigmaticus</i>	Unknown	1921	CA/San Francisco Bay	Shipping (Hull Fouling; Ballast Water)
Nudibranchia	<i>Tenellia adpersa</i>	Amphi-Atlantic	1953	CA/San Francisco Bay	Shipping (Hull Fouling; Ballast Water)
Cirripedia	<i>Balanus amphitrite</i>	Indo-Pacific	1921	La Jolla/CA/Pacific Ocean	Shipping (Hull Fouling; Ballast Water)
Cirripedia	<i>Balanus improvisus</i>	NW Atlantic	1853	CA/San Francisco Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Cirripedia	<i>Balanus reticulatus</i>	Indo-Pacific	1985	Mazatlan/Mexico/Pacific Ocean	Shipping (Hull Fouling; Ballast Water)
Bryozoa	<i>Bugula fulva</i>	Amphi-Atlantic	2003	CA/Monterey Bay	Shipping (Hull Fouling)
Bryozoa	<i>Bugula neritina</i>	Unknown	1905	CA/Monterey Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Bryozoa	<i>Bugula stolonifera</i>	NW Atlantic?	1985	CA/Monterey Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Bryozoa	<i>Conopeum seurati</i>	NE Atlantic?	Unknown	Unknown	Shipping (Hull Fouling; Ballast Water)
Bryozoa	<i>Conopeum tenuissimum</i>	NW Atlantic	1951	CA/San Francisco Bay	Shipping (Hull Fouling; Ballast Water)
Bryozoa	<i>Cryptosula pallasiana</i>	Amphi-Atlantic	1947	CA/San Francisco Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Bryozoa	<i>Schizoporella unicornis</i>	NE Atlantic?	1927	WA/Puget Sound	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Bryozoa	<i>Victorella pavida</i>	Unknown	1967	CA/San Francisco Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Bryozoa	<i>Watersipora arcuata</i>	Unknown	1959	Mexico/Scammon's Lagoon (Gulf of California)	Shipping (Hull Fouling)
Bryozoa	<i>Watersipora subtorquata</i>	Unknown	1989	CA/Drakes Estero	Shipping (Hull Fouling)
Bryozoa	<i>Zoobotryon verticillatum</i>	Unknown	1900	CA/ San Diego Bay	Shipping (Hull Fouling)

Tunicata	<i>Ascidia zara</i>	NW Pacific	1982	CA/Long Beach Harbor	Shipping (Hull Fouling)
Tunicata	<i>Botrylloides perspicuum</i>	Indo-Pacific	1997	CA/ San Diego Bay	Shipping (Hull Fouling)
Tunicata	<i>Botrylloides violaceus</i>	NW Pacific	1973	CA/San Francisco Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Tunicata	<i>Botryllus schlosseri</i>	NE Atlantic?	1947	CA/San Francisco Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Tunicata	<i>Ciona intestinalis</i>	Amphi-Atlantic	1897	CA/San Diego Bay	Shipping (Hull Fouling)
Tunicata	<i>Ciona savignyi</i>	NW Pacific	1985	CA/Long Beach Harbor	Shipping (Hull Fouling; Ballast Water)
Tunicata	<i>Didemnum sp. A.</i>	Unknown	1993	CA/San Francisco Bay	Shipping (Hull Fouling)
Tunicata	<i>Diplosoma listerianum</i>	NE Atlantic?	1917	CA/ San Diego Bay	Shipping (Hull Fouling)
Tunicata	<i>Molgula manhattensis</i>	Amphi-Atlantic	1949	CA/Tomales Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Tunicata	<i>Molgula sp. A.</i>	Unknown	Unknown	southern CA	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Tunicata	<i>Polyandrocarpa zorritensis</i>	SE Pacific?	1994	CA/Oceanside Harbor	Shipping (Hull Fouling)
Tunicata	<i>Styela clava</i>	NW Pacific	1933	CA/Newport Bay	Shipping (Hull Fouling); Fisheries (Oysters-Accidental)
Tunicata	<i>Styela plicata</i>	Unknown	1915	CA/ San Diego Bay	Shipping (Hull Fouling)
Tunicata	<i>Symplegma reptans</i>	Indo-Pacific	1997	CA/Mission Bay	Shipping (Hull Fouling)



Table 4. Species overlap and beta diversity between marinas and other sites, for all species and NIS.

Reserve	# Species in marinas (#plates)	# Species in reserve, buoy or frame (# plates)	# Species in both habitats (% overlap)	# Non-overlapping species (%)	# NIS in marinas	# NIS in reserve (buoy or frame)	# NIS in both habitats (%)	# Non-overlapping NIS (%)
Tijuana River	44 (23)	10 (14 frame)	3 (5.9)	48 (94.1)	19	3	1 (4.8)	20 (95.2)
Channel Islands	31 (18)	9 (12 buoy)	1 (2.6)	38 (97.4)	16	0	0 (0)	16 (N/A)
Monterey Bay	25 (11)	8 (5 buoy)	1 (3.1)	31 (96.9)	12	0	0 (0)	12 (N/A)
Elkhorn Slough	23 (12)	18 (29 frame)	10 (32.3)	21 (67.7)	13	8	6 (40.0)	9 (60.0)
Gulf of Farallones	38 (15)	11 (6 buoy)	10 (25.6)	29 (74.4)	13	6	6 (46.3)	7 (53.8)
South Slough	29 (11)	26 (41 frame)	12 (27.9)	31 (72.1)	7	3	3 (42.9)	4 (57.1)
Olympic Coast	22 (12)	20 (8 buoy)	6 (16.7)	30 (83.3)	4	0	0 (0)	4 (N/A)
Padilla Bay	18 (10)	17 (16 frame, buoy)	8 (29.6)	19 (70.4)	5	2	2 (28.6)	5 (71.4)
Kachemak Bay	22 (11)	17 (8 buoy)	10 (34.5)	19 (65.5)	0	0	N/A	N/A

Table 5. Average number individuals per trap per species at each Reserve.

Species	Site					
	NERR:	TR (29)	ES (55)	SS (27)	PB (21)	KB* (8)
<b>Crabs</b>						
<i>Hemigrapsus oregonensis</i> (Hairy shore crab)		8.45	12.5	0	0	0
<i>Pachygrapsus crassipes</i> (Striped shore crab)		1.38	.69	0	0	0
<i>Telmessus cheiragonus</i> (Helmet crab)		0	0	0	0	1.13
<i>Cancer gracilis</i> (Graceful crab)		0	0	0	.10	0
<i>Cancer magister</i> (Dungeness crab)		0	0	7.48	0	0.25
<i>Cancer productus</i> (Red rock crab)		0	0.71	1.78	.10	0
<i>Carcinus maenas</i> (Green crab) NIS		0	17.09	0	0	0
<b>Fish</b>						
<i>Fundulus parvipinnis</i> (California killifish)		0.07	0	0	0	0
<i>Scorpaenichthys marmoratus</i> (Cabezon sculpin)		0	0.02	0	0	0
<i>Leptocottus armatus</i> (Staghorn sculpin)		0	0.20	0.26	.24	0
<i>Paralabrax clathratus</i> (Kelp bass)		0	0.02	0	0	0
<i>Cymatogaster aggregata</i> (Shiner surfperch)		0	0	0	.05	0
<i>Pholis ornata</i> (Saddleback gunnel)		0	0	0	.05	0
<i>Tridentiger trigonocephalus</i> ** (Chameleon goby) NIS		0.10	0	0	0	0
<i>Gillichthys mirabilis</i> (Longjaw mudsucker)		0.28	0.55	0	0	0
<i>Clevelandia ios</i> (Arrow goby)		0.03	0	0	0	0

NERR: TR = Tijuana River; ES = Elkhorn Slough; SS = South Slough; PB = Padilla Bay; KB = Kachemak Bay. Number of traps in parentheses (N).

\* All results are from 2003 except the Kachemak Bay NERR results, which are from 2004. No organisms were caught in traps at Kachemak in 2003.

\*\* = ID not verified

<b>Table OC-1. Site Location Characteristics and Survey Schedule</b>							
<b>Site Code</b>	<b>Site Name</b>	<b>Habitat</b>	<b>Sample Date</b>	<b>Start Time</b>	<b>End Time</b>	<b>Surf Temp (°C)</b>	<b>Surf Salinity (ppt)</b>
BP	Strawberry Island (Bahobohosh Point)	Rock Shelf	8/19/01	700	800	13	31.6
	Strawberry Island (Bahobohosh Point)	Rock Shelf	7/24/02				
CARS	Cape Alava Rock Shelf	Rock Shelf	8/7/02	620	720	14.9	32.7
CAWR	Wedding Rocks	Rock Shelf	8/7/02	550	650	13.3	32.6
CB	Cannonball	Rock Shelf	8/7/02	830	937	14	34
CBM	Cannonball Mud	Mud Flat	8/7/02	950	1005	16.5	32
CME	Chilean Memorial Exposed	Rock Shelf	8/20/01	800	900	11	34
CMP	Chilean Memorial Protected	Rock Shelf	8/20/01	930	1030	12	32.8
DI	Destruction Island	Boulders with rock outcrops	8/11/02	945	1115	11	32.8
HRC	Diamond Rock (Hoh River)	Cobble Beach	8/22/01	845	945	12.5	25.1
KBS	Kayostla Beach Sand	Sandy Beach	8/9/02	955	1030		
LP	La Push Marina	Dock	8/20/01	1400	1445	12.5	31.2
NB1	Neah Bay Marina	Dock	8/12/02				
	Neah Bay Marina	Dock	7/23/02				
	Neah Bay Marina	Dock	8/18/01	1345	1445	12	30.2
NB2	Neah Bay School Creek	Rock Shelf	8/18/01	1010	1100	15	30
NMM	Norwegian Memorial Middle	Rock Shelf	8/9/02	845	945	13.1	32.7
NPRS	Norwegian Point Rock Shelf	Rock Shelf	8/9/02	702	830	11.5	32.7
PG	Point Grenville Rock	Rock Shelf	8/10/02	840	945	10.9	32.2
PGS	Point Grenville Sand	Sandy Beach	8/10/02	1025	1120	12	32.2
QR	Quillayute River	Salt Water Wedge	8/21/01				
RB	Rialto Beach	Gravel Beach	8/20/01	1130	1200	13.5	32
SB	Sooes Beach	Sandy Beach	8/19/01	820	920	13	31.9
SB1	Second Beach Rock Shelf	Rock Shelf	8/6/02	624	730	12	32.4





**Table 4. Native Invertebrate Species with Range Expansions in OCNMS 2001-2002**

Category	Species Name	BP	CARS	CAWR	CME	CMP	DI	HRC	LP	NB1	NB2	NMM	NPRS	PG	SB1	SB2	TBR	WP	WR
Mollusca: Bivalvia: Pteriomorpha	Adula diegensis							X							X	X	X		
Arthropoda: Crustacea: Isopoda	Idotea (Pentidotea) recta							X							X			X	
Arthropoda: Crustacea: Isopoda	Joeropsis dubia dubia														X				

## **Appendix A. Taxonomists who provided or will provide identifications to taxa in study**

### **ANNELIDA**

#### **Serpulids**

Linda McCann (Smithsonian Environmental Research Center, MD)

Rolando Bastida-Zavala, Universidad del Mar (Oaxaca, Mexico)

### **BRYOZOA**

Linda McCann (Smithsonian Environmental Research Center, MD)

Natasha Gray Hitchcock (Smithsonian Environmental Research Center, MD)

Judy Winston (Virginia Museum of Natural History, VA)

Scott Santagata (Smithsonian Marine Station at Fort Pierce, FL)

Matthew H. Dick (Hokkaido University, Sapporo, Japan)

Josh Mackie (SUNY Stony Brook, NY)

### **CIRRIPEDIA**

Chris W. Brown (Smithsonian Environmental Research Center, CA)

Francis Kerckhof (Royal Belgian Institute of Natural Sciences, Oostende, Belgium)

### **HYDROZOA**

Lea-Anne Henry (Argyll, UK)

### **MOLLUSCA**

#### **Bivalvia**

Nora Foster (University of Alaska Museum of the North, AK)

#### **Nudibranchia**

Jeff Goddard (Marine Science Institute UCSB, CA)

### **PORIFERA**

Chris W. Brown (Smithsonian Environmental Research Center, CA)

### **TUNICATA**

Gretchen and Charlie Lambert (UC Fullerton, CA)

Appendix B. Number of each species caught in traps at west coast NERRS sites in fall 2003.

Site	# Traps	Crabs							Fish									
		H.o	Pac	T.c	C.g	Can	C.p	Car	F.p	S.m	L.a	Par	C.a	P.o	T.t*	G.m	C.i	
<b>Tijuana River</b>	29 (13,16)	245	40	0	0	0	0	0	2	0	0	0	0	0	0	3	8	1
Main Channel	8 (4,4)	18	4															
Model Marsh	7 (3,4)	2	16														7	
Oneonta Slough	7 (3,4)	201	6														1	
Tidal Linkage	7 (3,4)	24	14						2						3			1
<b>Elkhorn Slough</b>	55 (28,27)	693	38	0	0	0	39	940	0	1	11	1	0	0	0	30	0	0
Azevedo Pond	8 (4,4)	1	38					149			1							
Hudson Landing	8 (4,4)	72						19								1		
Hummingbird Is	8 (4,4)	2						204			7							
Kirby Park	7 (4,3)	351					1	41										
North Marsh	8 (4,4)	3						402								27		
Vierra's	8 (4,4)	1						38		1		1						
Whistle Stop Lgn	8 (4,4)	267						125			3						2	
<b>South Slough</b>	27 (16,11)	0	0	0	0	202	48	0	0	0	7	0	0	0	0	0	0	0
Brown's Cove	7 (4,3)						33	38					5					
Sengstaken arm	7 (4,3)						73						2					
Valino Is	7 (4,3)						41	10										
Winchester arm	6 (4,2)						55											
<b>Padilla Bay</b>	21 (12,9)	0	0	0	2	0	2	0	0	0	5	0	1	1	0	0	0	0
Bayview Channel	8 (4,4)				1							2						
Middle Channel	6 (4,2)							2					1					
Ploug Channel	7 (4,3)				1							3		1				
<b>Kachemak Bay</b>	16 (8,8)	0	0	9	0	2	0	0	0	0	0	0	0	0	0	0	0	0
Homer pilings 2003	8 (4,4)																	
Homer pilings 2004	8 (4,4)			9			2											

# Traps retrieved (# Collapsible traps, # Minnow traps)

Crabs: H.o: *Hemigrapsus oregonensis* (Hairy shore crab); Pac: *Pachygrapsus crassipes* (Striped shore crab); T.c: *Telmessus cheiragonus* (Helmet crab); C.g: *Cancer gracilis* (Graceful crab); Can: *Cancer magister* (Dungeness crab); C.p: *Cancer productus* (Red rock crab); Car: *Carcinus maenas* (Green crab);

Fish: F.p: *Fundulus parvipinnis* (California killifish); S.m: *Scorpaenichthys marmoratus* (Cabezon sculpin); L.a: *Leptocottus armatus* (Staghorn sculpin); Par: *Paralabrax clathratus* (Kelp bass); C.a: *Cymatogaster aggregata* (Shiner surfperch); O,i: *Pholis ornata* (Saddleback gunnel); T.t: *Tridentiger trigonocephalus* (Chameleon goby – ID not verified); G.m: *Gillichthys mirabilis* (Longjaw mudsucker); C.i: *Clevelandia ios* (Arrow goby)

\*ID not verified



ng plates at each Reserve or Sanctuary site.

Year	Reserve	Site	ModTaxa	Genus	Species	#Plates at site with taxa	Notes	NIS?
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Bowerbankia	sp.	3		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Bugula	neritina	2		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Bugula	sp. Y	2		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Celleporaria	brunnea	6		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Celleporina	robertsoniae	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Crisulipora	occidentalis	6		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Crisulipora	sp.	4		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Cryptosula	pallasiana	1		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Cyclostomata		1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Hippopodina	feegeensis	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Schizoporella	sp. A	4		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Smittoidea	prolifca	4		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Thalamoporella	californica	6		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Tubulipora	pacifica	2		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Tubulipora	sp.	2		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Tubulipora	tuba	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Watersipora	arcuata	5		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Watersipora	subtorquata	6		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Bryozoa	Zoobotryon	verticillatum	4		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Cirripedia	Balanus	amphitrite	1		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Cirripedia	Balanus	trigonus	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Hydrozoa	Aglaophenia	sp.	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Hydrozoa	Aglaophenia	struthionides	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Nudibranchia	Hermisenda	crassicornis	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Aplidium	californicum	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Ascidia	sp.	1		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Ascidia	zara	4		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Botrylloides	perspicuum	5		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Botryllus	schlosseri	6		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Ciona	intestinalis	4		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Ciona	savignyi	2		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Diplosoma	listerianum	3		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Perophora	annectens	2		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Polyandrocarpa	zorritensis	2		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Styela	clava	1		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Styela	plicata	3		yes
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Styela	sp.	3		no
2003	Tijuana River	Mission Bay, Dana Point Marina	Tunicata	Symplegma	reptans	4		yes

2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Bugula	neritina	1	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Bugula	sp.	2	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Bugula	sp. Y	3	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Celleporaria	brunnea	6	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Celleporina	robertsoniae	1	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Celleporina	sp.	1	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Crisulipora	occidentalis	3	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Cryptosula	pallasiana	1	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Schizoporella	sp. A	1	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Thalamoporella	californica	6	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Tubulipora	sp.	2	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Tubulipora	tuba	5	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Watersipora	arcuata	4	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Watersipora	subtorquata	6	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Bryozoa	Zoobotryon	verticillatum	1	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Cirripedia	Balanus	amphitrite	3	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Aplidium	californicum	2	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Ascidia	sp.	1	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Ascidia	zara	2	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Botrylloides	perspicuum	5	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Botrylloides	violaceus	1	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Botryllus	schlosseri	6	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Ciona	intestinalis	4	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Ciona	savignyi	6	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Diplosoma	listerianum	4	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Distaplia	occidentalis	4	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Polyandrocarpa	zorritensis	1	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Styela	plicata	1	yes
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Styela	sp.	1	no
2003	Tijuana River	Mission Bay, Seaforth Marina	Tunicata	Styelidae		1	no
2003	Tijuana River	Model Marsh	Bryozoa	Bowerbankia	sp.	1	no
2003	Tijuana River	Model Marsh	Bryozoa	Victorella	pavida	4	yes
2003	Tijuana River	Model Marsh	Cirripedia	Balanus	amphitrite	5	yes
2003	Tijuana River	Model Marsh	Cirripedia	Balanus	glandula	1	no
2003	Tijuana River	Model Marsh	Cirripedia	Chthamalus	sp.	3	no
2003	Tijuana River	Model Marsh	Hydrozoa	Thecata		1	no
2003	Tijuana River	Oneonta Slough	Bryozoa	Bowerbankia	sp.	1	no
2003	Tijuana River	Oneonta Slough	Cirripedia	Balanus	amphitrite	4	yes
2003	Tijuana River	Oneonta Slough	Cirripedia	Balanus	improvisus	1	yes
2003	Tijuana River	Oneonta Slough	Cirripedia	Balanus	trigonus	1	no
2003	Tijuana River	Oneonta Slough	Hydrozoa	Campanulariidae		3	no
2003	Tijuana River	Oneonta Slough	Hydrozoa	Clytia	sp.	2	no
2003	Tijuana River	Oneonta Slough	Hydrozoa	Obelia	longissima	1	no

2003	Tijuana River	Oneonta Slough	Hydrozoa	Obelia	sp.	2		no
2003	Tijuana River	Oneonta Slough	Nudibranchia	Cuthona	albocrusta	2		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Amathia	sp.	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Celleporaria	brunnea	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Disporella	sp.	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Hippopodina	feegeensis	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Lichenopora	sp. 1	2		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Scrupocellaria	bertholetti	1		no
					tenuirostris			
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Thalamoporella	californica	4		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Thalamoporella	sp.	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Watersipora	subtorquata	1		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Bryozoa	Zoobotryon	verticillatum	6		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Cirripedia	Balanus	amphitrite	2		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Hydrozoa	Endothecium	sp.	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Aplidium	californicum	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Ascidia	zara	3		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Botrylloides	diegensis	2		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Botrylloides	perspicuum	1		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Ciona	savignyi	1		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Diplosoma	listerianum	4		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Distaplia	occidentalis	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Distaplia	sp.	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Molgula	sp.	1		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Perophora	annectens	3		no
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Polyandrocarpa	zorritensis	3		yes
2003	Tijuana River	SD Bay, Chula Vista Marina	Tunicata	Styela	sp.	4		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Bugula	sp. Y	1		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Celleporaria	brunnea	2		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Celleporina	robertsoniae	2		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Crisulipora	occidentalis	2		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Cyclostomata		1		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Thalamoporella	californica	1		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Tubulipora	sp.	2	?	no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Tubulipora	tuba	1		no
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Watersipora	arcuata	4		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Watersipora	subtorquata	3		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Bryozoa	Zoobotryon	verticillatum	4		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Cirripedia	Balanus	amphitrite	1		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Cirripedia	Balanus	reticulatus	1		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Hydrozoa	Bougainvillia	sp.	2		no
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Ascidia	ceratodes	1		no
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Ascidia	zara	2		yes

2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Botrylloides	violaceus	3		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Botryllus	schlosseri	4		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Ciona	intestinalis	2		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Ciona	savignyi	4		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Diplosoma	listerianum	5		yes
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Distaplia	occidentalis	3		no
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Molgula	sp.	1		no
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Molgula	sp. A	1	was verrucifera,	yes
							GL changed	
2003	Tijuana River	SD Bay, Sunroad Marina	Tunicata	Perophora	annectens	4		no
2003	Tijuana River	Tidal Linkage	Bryozoa	Ctenostomata		1		no
2003	Tijuana River	Tidal Linkage	Cirripedia	Balanus	amphitrite	1		yes
2003	Tijuana River	Tidal Linkage	Hydrozoa	Campanulariidae		1		no
2003	Tijuana River	Tijuana River Main Channel	Bryozoa	Victorella	pavida	1		yes
2004	Channel Is	Alegria (PISCO)	Bryozoa	Alcyonidium			ID not verified	no
2004	Channel Is	Alegria (PISCO)	Bryozoa	Bryo sp.			ID not verified	
2004	Channel Is	Alegria (PISCO)	Hydrozoa	Obelia	longissima	2		no
2004	Channel Is	Alegria (PISCO)	Nudibranchia	Eubranchus	rustyus	1		no
2004	Channel Is	Arguello (PISCO)	Bryozoa	Bryo sp.			ID not verified	
2004	Channel Is	Arguello (PISCO)	Bryozoa	Membraniporidae			ID not verified	no
2004	Channel Is	Arguello (PISCO)	Hydrozoa	Campanulariidae		1		no
2004	Channel Is	Arguello (PISCO)	Hydrozoa	Obelia	sp.	1		no
2004	Channel Is	Ellwood (PISCO)	Bryozoa	Alcyonidium			ID not verified	no
2004	Channel Is	Ellwood (PISCO)	Bryozoa	Bryozoa			ID not verified	
2004	Channel Is	Ellwood (PISCO)	Bryozoa	Victorellidae			ID not verified	
2004	Channel Is	Ellwood (PISCO)	Cirripedia	Megabalanus	californicus	1		no
2004	Channel Is	Ellwood (PISCO)	Cirripedia	Megabalanus	sp.	1		no
2004	Channel Is	Ellwood (PISCO)	Hydrozoa	Campanulariidae		1		no
2004	Channel Is	Ellwood (PISCO)	Hydrozoa	Obelia	longissima	1		no
2004	Channel Is	Ellwood (PISCO)	Hydrozoa	Obelia	sp.	1		no
2004	Channel Is	Jalama (PISCO)	Bryozoa	Alcyonidium			ID not verified	no
2004	Channel Is	Jalama (PISCO)	Bryozoa	Bryozoa			ID not verified	
2004	Channel Is	Jalama (PISCO)	Bryozoa	Conopeum			ID not verified	
2004	Channel Is	Jalama (PISCO)	Bryozoa	Victorellidae			ID not verified	
2004	Channel Is	Jalama (PISCO)	Cirripedia	Balanus	sp.	1		no
2004	Channel Is	Jalama (PISCO)	Cirripedia	Megabalanus	californicus	1		no
2004	Channel Is	Jalama (PISCO)	Hydrozoa	Calycella	syringa	1		no
2004	Channel Is	Jalama (PISCO)	Hydrozoa	Campanulariidae		2		no
2004	Channel Is	Jalama (PISCO)	Hydrozoa	Sarsia	eximia	1		no
2004	Channel Is	Jalama (PISCO)	Nudibranchia	Hermisenda	crassicornis	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Bowerbankia	sp.	2		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Bugula	californica	1		no

2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Bugula	fulva	1	flabellata, as original ID	yes
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Bugula	neritina	6		yes
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Bugula	sp.	2		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Bugula	stolonifera	1		yes
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Celleporaria	brunnea	4		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Celleporaria	sp.	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Celleporina	robertsoniae	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Celleporina	sp.	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Crisia	sp.	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Crisulipora	occidentalis	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Cryptosula	pallasiana	5		yes
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Thalamoporella	californica	1		no
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Watersipora	arcuata	3		yes
2004	Channel Is	Oxnard, Vintage Marina	Bryozoa	Watersipora	subtorquata	6		yes
2004	Channel Is	Oxnard, Vintage Marina	Hydrozoa	Plumularia	lagenifera	1		no
2004	Channel Is	Oxnard, Vintage Marina	Nudibranchia	Hermisenda	crassicornis	1		no
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Ascidia	ceratodes	8		no
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Ascidia	sp.	2		no
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Ascidia	zara	1		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Botryllidae		3		no
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Botrylloides	sp.	1		no
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Botrylloides	violaceus	5		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Botryllus	schlosseri	7		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Ciona	intestinalis	8		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Ciona	savignyi	1		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Diplosoma	listerianum	5		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Distaplia	occidentalis	4		no
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Styela	clava	2		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Styela	plicata	6		yes
2004	Channel Is	Oxnard, Vintage Marina	Tunicata	Styela	sp.	2		no
2004	Channel Is	Point Sal (PISCO)	Bryozoa	Bryo sp.			ID not verified	
2004	Channel Is	Point Sal (PISCO)	Bryozoa	Victorellidae			ID not verified	
2004	Channel Is	Point Sal (PISCO)	Hydrozoa	Calycella	syringa	1		no
2004	Channel Is	Point Sal (PISCO)	Hydrozoa	Campanulariidae		2		no
2004	Channel Is	Point Sal (PISCO)	Hydrozoa	Corynidae		1		no
2004	Channel Is	Point Sal (PISCO)	Hydrozoa	Obelia	longissima	1		no
2004	Channel Is	Point Sal (PISCO)	Hydrozoa	Obelia	sp.	1		no
2004	Channel Is	Point Sal (PISCO)	Hydrozoa	Sarsia	eximia	2		no
2004	Channel Is	Point Sal (PISCO)	Nudibranchia	Doto	form A of Goddard	1		no
2004	Channel Is	Point Sal (PISCO)	Nudibranchia	Eubbranchus	rustyus	2		no
2004	Channel Is	Point Sal (PISCO)	Nudibranchia	Flabellina	trilineata	1		no

2004	Channel Is	Point Sal (PISCO)	Nudibranchia	Hermisenda	crassicornis	1		no
2004	Channel Is	Purisima Point (PISCO)	Bryozoa	Bowerbankia			ID not verified	
2004	Channel Is	Purisima Point (PISCO)	Bryozoa	Membraniporidae			ID not verified	
2004	Channel Is	Purisima Point (PISCO)	Cirripedia	Balanus	crenatus	1		no
2004	Channel Is	Purisima Point (PISCO)	Cirripedia	Megabalanus	californicus	2		no
2004	Channel Is	Purisima Point (PISCO)	Hydrozoa	Campanulariidae		1		no
2004	Channel Is	Purisima Point (PISCO)	Hydrozoa	Obelia	sp.	2		no
2004	Channel Is	Purisima Point (PISCO)	Hydrozoa	Sarsia	eximia	2		no
2004	Channel Is	Purisima Point (PISCO)	Nudibranchia	Doto	form A of Goddard	1		no
2004	Channel Is	Purisima Point (PISCO)	Nudibranchia	Hermisenda	crassicornis	1		no
2004	Channel Is	Ventura West Harbor	Bryozoa	Bowerbankia	aggregata	1	?	no
2004	Channel Is	Ventura West Harbor	Bryozoa	Bowerbankia	sp.	2		no
2004	Channel Is	Ventura West Harbor	Bryozoa	Bugula	neritina	7		yes
2004	Channel Is	Ventura West Harbor	Bryozoa	Bugula	sp.	2		no
2004	Channel Is	Ventura West Harbor	Bryozoa	Bugula	sp. Y	2		no
2004	Channel Is	Ventura West Harbor	Bryozoa	Bugula	stolonifera	5		yes
2004	Channel Is	Ventura West Harbor	Bryozoa	Cryptosula	pallasiana	6		yes
2004	Channel Is	Ventura West Harbor	Bryozoa	Watersipora	arcuata	5		yes
2004	Channel Is	Ventura West Harbor	Bryozoa	Watersipora	subtorquata	6		yes
2004	Channel Is	Ventura West Harbor	Cirripedia	Balanus	amphitrite	3		yes
2004	Channel Is	Ventura West Harbor	Hydrozoa	Corynidae		1		no
2004	Channel Is	Ventura West Harbor	Tunicata	Aplidium	sp.	2		no
2004	Channel Is	Ventura West Harbor	Tunicata	Aplidium	sp. A	3		no
2004	Channel Is	Ventura West Harbor	Tunicata	Ascidia	ceratodes	3		no
2004	Channel Is	Ventura West Harbor	Tunicata	Ascidia	sp.	3		no
2004	Channel Is	Ventura West Harbor	Tunicata	Ascidia	sp. B	1		no
2004	Channel Is	Ventura West Harbor	Tunicata	Botryllus	schlosseri	1		yes
2004	Channel Is	Ventura West Harbor	Tunicata	Ciona	intestinalis	9		yes
2004	Channel Is	Ventura West Harbor	Tunicata	Diplosoma	listerianum	4		yes
2004	Channel Is	Ventura West Harbor	Tunicata	Molgula	manhattensis	3		yes
2004	Channel Is	Ventura West Harbor	Tunicata	Stolidobranchia		1		no
2004	Channel Is	Ventura West Harbor	Tunicata	Styela	plicata	3		yes
2004	Channel Is	Ventura West Harbor	Tunicata	Styela	sp.	1		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Alcyonidium	sp.	1		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Bowerbankia	aggregata	2		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Bowerbankia	sp.	2		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Bugula	fulva	1		yes
2003	Monterey Bay	Monterey Marina	Bryozoa	Bugula	neritina	4		yes
2003	Monterey Bay	Monterey Marina	Bryozoa	Bugula	sp.	2		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Bugula	sp. X	2		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Bugula	stolonifera	1	?	yes
2003	Monterey Bay	Monterey Marina	Bryozoa	Celleporaria	brunnea	5		no

2003	Monterey Bay	Monterey Marina	Bryozoa	Celleporella	hyalina	1		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Crisia	sp.	1		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Cryptosula	pallasiana	4		yes
2003	Monterey Bay	Monterey Marina	Bryozoa	Filicrisia	sp.	1		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Membranipora	sp.	1	?	no
2003	Monterey Bay	Monterey Marina	Bryozoa	Schizoporella	unicornis	2		yes
2003	Monterey Bay	Monterey Marina	Bryozoa	Tubulipora	sp.	1		no
2003	Monterey Bay	Monterey Marina	Bryozoa	Watersipora	subtorquata	5		yes
2003	Monterey Bay	Monterey Marina	Cirripedia	Balanus	crenatus	2		no
2003	Monterey Bay	Monterey Marina	Nudibranchia	Triopha	catalinae	1		no
2003	Monterey Bay	Monterey Marina	Tunicata	Ascidia	sp.	1		no
2003	Monterey Bay	Monterey Marina	Tunicata	Botrylloides	violaceus	3		yes
2003	Monterey Bay	Monterey Marina	Tunicata	Botryllus	schlosseri	3		yes
2003	Monterey Bay	Monterey Marina	Tunicata	Ciona	intestinalis	3		yes
2003	Monterey Bay	Monterey Marina	Tunicata	Ciona	savignyi	2		yes
2003	Monterey Bay	Monterey Marina	Tunicata	Diplosoma	listerianum	3		yes
2003	Monterey Bay	Monterey Marina	Tunicata	Styela	sp.	1		no
2003	Monterey Bay	Pt Sur (PISCO)	Cirripedia	Lepas	antifera	1		no
2003	Monterey Bay	Pt Sur (PISCO)	Cirripedia	Lepas	pectinata	1		no
					pacifica			
2003	Monterey Bay	Pt Sur (PISCO)	Hydrozoa	Obelia	longissima	1		no
2003	Monterey Bay	Pt Sur (PISCO)	Nudibranchia	Dendronotus	frondosus	1		no
2003	Monterey Bay	Sandhill Bluff (PISCO)	Cirripedia	Balanus	crenatus	1		no
2003	Monterey Bay	Santa Cruz Harbor	Bryozoa	Bowerbankia	sp.	2		no
2003	Monterey Bay	Santa Cruz Harbor	Bryozoa	Bugula	neritina	2		yes
2003	Monterey Bay	Santa Cruz Harbor	Bryozoa	Bugula	stolonifera	4		yes
2003	Monterey Bay	Santa Cruz Harbor	Bryozoa	Cryptosula	pallasiana	4		yes
2003	Monterey Bay	Santa Cruz Harbor	Bryozoa	Schizoporella	unicornis	4		yes
2003	Monterey Bay	Santa Cruz Harbor	Bryozoa	Watersipora	subtorquata	6		yes
2003	Monterey Bay	Santa Cruz Harbor	Tunicata	Ascidia	sp.	1	was sp. A, GL changed	no
2003	Monterey Bay	Santa Cruz Harbor	Tunicata	Botrylloides	violaceus	1		yes
2003	Monterey Bay	Santa Cruz Harbor	Tunicata	Botryllus	schlosseri	5		yes
2003	Monterey Bay	Santa Cruz Harbor	Tunicata	Diplosoma	listerianum	3		yes
2003	Monterey Bay	Santa Cruz Harbor	Tunicata	Molgula	manhattensis	3		yes
2003	Monterey Bay	Stillwater Beach (PISCO)	Cirripedia	Lepas	antifera	1		no
2003	Monterey Bay	Stillwater Beach (PISCO)	Cirripedia	Lepas	pectinata	1		no
					pacifica			
2003	Monterey Bay	Stillwater Beach (PISCO)	Hydrozoa	Campanulariidae		1		no
2004	Monterey Bay	Stillwater Cove (PISCO)	Cirripedia	Lepas	sp.	1		no
2004	Monterey Bay	Stillwater Cove (PISCO)	Hydrozoa	Campanulinidae		1		no
2004	Monterey Bay	Stillwater Cove (PISCO)	Hydrozoa	Corynidae		1		no
2004	Monterey Bay	Stillwater Cove (PISCO)	Nudibranchia	Dendronotus	frondosus	1		no

2004	Monterey Bay	Stillwater Cove (PISCO)	Nudibranchia	Doto	sp.	1		no
2003	Monterey Bay	Terrace Pt (PISCO)	Cirripedia	Balanus	crenatus	1	?	no
2003	Monterey Bay	Terrace Pt (PISCO)	Cirripedia	Lepas	antifera	1		no
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Amathia	sp.	1		no
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Amathia	vidovici	2		no
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Bowerbankia	aggregata	2		no
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Bowerbankia	sp.	3		no
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Bugula	neritina	2		yes
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Bugula	stolonifera	1	?	yes
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Buskia	seriata	2		no
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Conopeum	seurati	2		yes
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Cryptosula	pallasiana	3		yes
2003	Elkhorn Slough	Azevedo Pond	Bryozoa	Smittoidea	prolifera	1		no
2003	Elkhorn Slough	Azevedo Pond	Hydrozoa	Obelia	longissima	1		no
2003	Elkhorn Slough	Azevedo Pond	Nudibranchia	Tenellia	adpersa	1		yes
2003	Elkhorn Slough	Hudson Landing West	Bryozoa	Amathia	vidovici	1		no
2003	Elkhorn Slough	Hudson Landing West	Bryozoa	Bowerbankia	aggregata	1	?	no
2003	Elkhorn Slough	Hudson Landing West	Bryozoa	Bowerbankia	sp.	2		no
2003	Elkhorn Slough	Hudson Landing West	Bryozoa	Conopeum	seurati	3		yes
2003	Elkhorn Slough	Hudson Landing West	Bryozoa	victorella	pavida	1		yes
2003	Elkhorn Slough	Hudson Landing West	Tunicata	Botryllus	schlosseri	1		yes
2003	Elkhorn Slough	Hummingbird Island	Bryozoa	Amathia	vidovici	2		no
2003	Elkhorn Slough	Hummingbird Island	Bryozoa	Buskia	seriata	1		no
2003	Elkhorn Slough	Kirby Park	Bryozoa	Amathia	sp.	4		no
2003	Elkhorn Slough	Kirby Park	Bryozoa	Amathia	vidovici	6		no
2003	Elkhorn Slough	Kirby Park	Bryozoa	Bowerbankia	sp.	1		no
2003	Elkhorn Slough	Kirby Park	Bryozoa	Bugula	neritina	6		yes
2003	Elkhorn Slough	Kirby Park	Bryozoa	Bugula	sp.	2		no
2003	Elkhorn Slough	Kirby Park	Bryozoa	Conopeum	osburni	5	?	no
2003	Elkhorn Slough	Kirby Park	Bryozoa	Cryptosula	pallasiana	5		yes
2003	Elkhorn Slough	Kirby Park	Bryozoa	victorella	pavida	1		yes
2003	Elkhorn Slough	Kirby Park	Bryozoa	Watersipora	subtorquata	3		yes
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Amathia	sp.	1		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Amathia	vidovici	2	?	no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Bowerbankia	aggregata	1		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Bowerbankia	sp.	1		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Bugula	neritina	6		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Bugula	sp. X	3		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Bugula	stolonifera	6		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Cryptosula	pallasiana	2		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Schizoporella	unicornis	1		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	victorella	pavida	1		no
2003	Elkhorn Slough	Moss Landing, North	Bryozoa	Watersipora	subtorquata	6		no



2003	Elkhorn Slough	Moss Landing, North	Hydrozoa	Obelia	sp.	2	no
2003	Elkhorn Slough	Moss Landing, North	Nudibranchia	Dirona	picta	1	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Ascidia	zara	1	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Botrylloides	diegensis	1	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Botrylloides	violaceus	4	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Botryllus	schlosseri	6	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Didemnum	sp. A	6	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Diplosoma	listerianum	6	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Distaplia	occidentalis	6	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Styela	plicata	1	no
2003	Elkhorn Slough	Moss Landing, North	Tunicata	Styelidae		2	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Amathia	vidovici	1	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bowerbankia	aggregata	2	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bowerbankia	sp.	1	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bugula	longirostrata	2	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bugula	neritina	6	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bugula	sp.	1	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bugula	sp. 1	6	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Bugula	stolonifera	6	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Cryptosula	pallasiana	5	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Schizoporella	unicornis	1	no
2003	Elkhorn Slough	Moss Landing, South	Bryozoa	Watersipora	subtorquata	6	no
2003	Elkhorn Slough	Moss Landing, South	Cirripedia	Balanus	crenatus	1	no
2003	Elkhorn Slough	Moss Landing, South	Hydrozoa	Bougainvilliidae		1	no
2003	Elkhorn Slough	Moss Landing, South	Hydrozoa	Campanulariidae		1	no
2003	Elkhorn Slough	Moss Landing, South	Nudibranchia	Dirona	picta	1	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Ascidia	zara	4	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Botrylloides	violaceus	3	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Botryllus	schlosseri	4	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Ciona	savignyi	1	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Ciona	sp.	1	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Didemnum	sp. A	4	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Diplosoma	listerianum	6	no
2003	Elkhorn Slough	Moss Landing, South	Tunicata	Distaplia	occidentalis	5	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Amathia	sp.	1	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Amathia	vidovici	3	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Bowerbankia	sp.	2	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Bugula	neritina	3	yes
2003	Elkhorn Slough	North Marsh	Bryozoa	Bugula	sp.	2	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Bugula	sp. X	1	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Bugula	stolonifera	3	yes
2003	Elkhorn Slough	North Marsh	Bryozoa	Buskia	seriata	3	no
2003	Elkhorn Slough	North Marsh	Bryozoa	Conopeum	osburni	1	no

2003	Elkhorn Slough	North Marsh	Bryozoa	Cryptosula	pallasiana	2		yes
2003	Elkhorn Slough	North Marsh	Bryozoa	Watersipora	subtorquata	1	?	yes
2003	Elkhorn Slough	North Marsh	Hydrozoa	Campanulariidae		2		no
2003	Elkhorn Slough	South Marsh Restoration	Bryozoa	Amathia	vidovici	1		no
2003	Elkhorn Slough	South Marsh Restoration	Bryozoa	Bugula	neritina	1		yes
2003	Elkhorn Slough	South Marsh Restoration	Bryozoa	Bugula	sp.	1		no
2003	Elkhorn Slough	South Marsh Restoration	Bryozoa	Smittoidea	prolifera	1		no
2003	Elkhorn Slough	Vierra	Bryozoa	Bugula	sp.	1		no
2003	Elkhorn Slough	Vierra	Bryozoa	Watersipora	subtorquata	1		yes
2003	Elkhorn Slough	Vierra	Cirripedia	Balanus	crenatus	3		no
2003	Elkhorn Slough	Vierra	Hydrozoa	Campanulariidae		1		no
2003	Elkhorn Slough	Vierra	Hydrozoa	Campanulinidae		1		no
2003	Elkhorn Slough	Vierra	Hydrozoa	Clytia	sp.	2		no
2003	Elkhorn Slough	Vierra	Hydrozoa	Opercularella	lacerata	1		no
2003	Elkhorn Slough	Whistle Stop Lagoon	Bryozoa	Bugula	neritina	3		yes
2003	Elkhorn Slough	Whistle Stop Lagoon	Hydrozoa	Campanulariidae		1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Alcyonidium	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bowerbankia	sp.	5		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bugula	californica	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bugula	neritina	5		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bugula	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bugula	sp. 1	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bugula	sp. Y	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Bugula	stolonifera	5		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Celleporaria	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Conopeum	seurati	1		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Cryptosula	pallasiana	3		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Schizoporella	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Schizoporella	unicornis	5		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Bryozoa	Watersipora	subtorquata	5		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Cirripedia	Balanus	balanus	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Cirripedia	Balanus	crenatus	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Hydrozoa	Bougainvilliidae		1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Hydrozoa	Obelia	longissima	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Hydrozoa	Obelia	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Nudibranchia	Hermisenda	crassicornis	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Ascidia	ceratodes	3		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Ascidia	sp.	2		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Ascidia	sp. B	1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Ascidia	zara	3		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Botryllidae		1		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Botrylloides	sp.	2		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Botrylloides	violaceus	5		yes

2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Botryllus	schlosseri	4		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Ciona	intestinalis	2		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Didemnum	sp. A	5		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Diplosoma	listerianum	5		yes
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Distaplia	occidentalis	5		no
2004	Gulf of Farallones	Bodega Bay, Mason's Marina	Tunicata	Styela	sp.	2		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Bowerbankia	sp.	5		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Bugula	neritina	4		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Bugula	pacifica	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Bugula	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Bugula	stolonifera	5		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Celleporaria	brunnea	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Celleporella	hyalina	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Conopeum	osburni	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Conopeum	seurati	1		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Cryptosula	pallasiana	4		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Hippopodina	feegeensis	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Schizoporella	unicornis	5		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Smittinidae	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Bryozoa	Watersipora	subtorquata	5		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Cirripedia	Balanus	balanus	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Cirripedia	Balanus	crenatus	3		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Cirripedia	Balanus	sp.	3		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Hydrozoa	Bougainvilliidae		2		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Hydrozoa	Campanulariidae		1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Hydrozoa	Campanulinidae		2		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Hydrozoa	Obelia	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Hydrozoa	Opercularella	sp.	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Nudibranchia	Dendronotus	frondosus	2		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Nudibranchia	Dirona	picta	1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Ascidia	ceratodes	4		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Ascidia	sp.	3		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Botryllidae		1		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Botrylloides	sp.	2		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Botrylloides	violaceus	6		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Botryllus	schlosseri	4		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Didemnum	sp. A	5	alt. listed as D sp.	yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Diplosoma	listerianum	6		yes
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Distaplia	occidentalis	5		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Styela	sp.	5		no
2004	Gulf of Farallones	Bodega Bay, Porto Bodega Marina	Tunicata	Styela	truncata	1		no
2004	Gulf of Farallones	Tomales Bay, Clark	Bryozoa	Bryo sp			ID not verified	

2004	Gulf of Farallones	Tomales Bay, Clark	Bryozoa	Bugula sp			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Clark	Hydrozoa	Campanulariidae		1		no
2004	Gulf of Farallones	Tomales Bay, Clark	Hydrozoa	Obelia	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Clark	Tunicata	Ascidia	ceratodes	1		no
2004	Gulf of Farallones	Tomales Bay, Clark	Tunicata	Botrylloides	violaceus	1		yes
2004	Gulf of Farallones	Tomales Bay, Clark	Tunicata	Botryllus	schlosseri	1		yes
2004	Gulf of Farallones	Tomales Bay, Clark	Tunicata	Ciona	intestinalis	1		yes
2004	Gulf of Farallones	Tomales Bay, Clark	Tunicata	Didemnum	sp. A	1	alt. listed as D sp.	yes
2004	Gulf of Farallones	Tomales Bay, Clark	Tunicata	Diplosoma	listerianum	1		yes
2004	Gulf of Farallones	Tomales Bay, Duck Cove	Bryozoa	Bugula sp			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Duck Cove	Tunicata	Ascidia	ceratodes	1		no
2004	Gulf of Farallones	Tomales Bay, Duck Cove	Tunicata	Botryllidae		1		no
2004	Gulf of Farallones	Tomales Bay, Marshall	Bryozoa	Bryo sp			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Marshall	Bryozoa	Bugula	neritina		ID not verified	
2004	Gulf of Farallones	Tomales Bay, Marshall	Bryozoa	Bugula	sp		ID not verified	
2004	Gulf of Farallones	Tomales Bay, Marshall	Hydrozoa	Tubulariidae		1		no
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Ascidia	ceratodes	1		no
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Ascidia	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Botrylloides	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Botrylloides	violaceus	1		yes
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Botryllus	schlosseri	1		yes
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Ciona	intestinalis	1		yes
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Ciona	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Didemnum	sp. A	1	alt. listed as D sp.	yes
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Diplosoma	listerianum	1		yes
2004	Gulf of Farallones	Tomales Bay, Marshall	Tunicata	Molgula	manhattensis	1		yes
2004	Gulf of Farallones	Tomales Bay, Miller Park	Bryozoa	Bryo sp			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Miller Park	Bryozoa	Cryptosula			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Miller Park	Bryozoa	Victorellidae			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Miller Park	Bryozoa	Watersipora			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Miller Park	Cirripedia	Chthamalus	dalli	2		no
2004	Gulf of Farallones	Tomales Bay, Miller Park	Hydrozoa	Bougainvilliidae		1		no
2004	Gulf of Farallones	Tomales Bay, Miller Park	Hydrozoa	Campanulinidae		1		no
2004	Gulf of Farallones	Tomales Bay, Miller Park	Hydrozoa	Obelia	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Miller Park	Tunicata	Botryllidae		1		no
2004	Gulf of Farallones	Tomales Bay, Miller Park	Tunicata	Botrylloides	violaceus	4		yes
2004	Gulf of Farallones	Tomales Bay, Miller Park	Tunicata	Didemnum	sp. A	2	alt. listed as D sp.	yes
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Hydrozoa	Campanulariidae		1		no
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Hydrozoa	Obelia	longissima	1		no
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Hydrozoa	Obelia	sp.	1		no

2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Nudibranchia	Dendronotus	frondosus	1		no
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Tunicata	Aplousobranchia		1		no
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Tunicata	Botrylloides	violaceus	1		yes
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Tunicata	Botryllus	schlosseri	1		yes
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Tunicata	Distaplia	occidentalis	1		no
2004	Gulf of Farallones	Tomales Bay, Nick's Cove	Tunicata	Molgula	manhattensis	1		yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Bryozoa			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Bugula			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Bugula			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Conopeum			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Cryptosula			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Schizoporella			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Victorellidae			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Bryozoa	Watersipora			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Nudibranchia	Dendronotus	frondosus	1		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Ascidia	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Ascidia	sp. B	2		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Botryllidae		4		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Botrylloides	sp.	2		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Botrylloides	violaceus	2		yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Botryllus	schlosseri	2		yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Ciona	intestinalis	3		yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Ciona	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Didemnum	sp. A	4	alt. listed as D sp.	yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Diplosoma	listerianum	2		yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Distaplia	occidentalis	3		no
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Molgula	manhattensis	3		yes
2004	Gulf of Farallones	Tomales Bay, Sacramento Landing	Tunicata	Perophora	annectens	3		no
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Bryozoa	Bryo sp			ID not verified	
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Bryozoa	Bugula	neritina			
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Bryozoa	Bugula	sp		ID not verified	
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Hydrozoa	Obelia	longissima	1		no
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Tunicata	Botrylloides	violaceus	1		yes
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Tunicata	Botryllus	schlosseri	1		yes
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Tunicata	Ciona	sp.	1		no
2004	Gulf of Farallones	Tomales Bay, Shell Beach	Tunicata	Molgula	manhattensis	1		yes
2004	Gulf of Farallones	Tomales Bay, Thomas Station	Bryozoa	Bugula	neritina			yes
2004	Gulf of Farallones	Tomales Bay, Thomas Station	Bryozoa	Bugula	sp		ID not verified	
2004	Gulf of Farallones	Tomales Bay, Thomas Station	Tunicata	Botrylloides	violaceus	1		yes
2004	Gulf of Farallones	Tomales Bay, Thomas Station	Tunicata	Ciona	intestinalis	1		yes
2004	Gulf of Farallones	Tomales Bay, Thomas Station	Tunicata	Didemnum	sp. A	1	alt. listed as D sp.	yes

2004	Gulf of Farallones	Tomales Bay, Thomas Station	Tunicata	Diplosoma	listerianum	1	yes
2004	Gulf of Farallones	Tomales Bay, Thomas Station	Tunicata	Molgula	manhattensis	1	yes
2004	Gulf of Farallones	Tomales Bay, Tomales Beach	Tunicata	Botrylloides	violaceus	1	yes
2003	South Slough	Charleston Boat Basin	Bryozoa	Alcyonidium	sp.	2	no
2003	South Slough	Charleston Boat Basin	Bryozoa	Bowerbankia	aggregata	1	no
2003	South Slough	Charleston Boat Basin	Bryozoa	Bowerbankia	sp.	4	no
2003	South Slough	Charleston Boat Basin	Bryozoa	Bugula	pacifica	2	no
2003	South Slough	Charleston Boat Basin	Bryozoa	Bugula	sp.	1	no
2003	South Slough	Charleston Boat Basin	Bryozoa	Celleporella	hyalina	1	no
2003	South Slough	Charleston Boat Basin	Bryozoa	Conopeum	seurati	1	yes
2003	South Slough	Charleston Boat Basin	Bryozoa	Cryptosula	pallasiana	3	yes
2003	South Slough	Charleston Boat Basin	Bryozoa	Schizoporella	unicornis	4	yes
2003	South Slough	Charleston Boat Basin	Cirripedia	Balanus	crenatus	3	no
2003	South Slough	Charleston Boat Basin	Cirripedia	Balanus	glandula	3	no
2003	South Slough	Charleston Boat Basin	Cirripedia	Balanus	improvisus	1	yes
2003	South Slough	Charleston Boat Basin	Hydrozoa	Campanulariidae		1	no
2003	South Slough	Charleston Boat Basin	Hydrozoa	Obelia	longissima	2	no
2003	South Slough	Charleston Boat Basin	Tunicata	Botrylloides	violaceus	4	yes
2003	South Slough	Charleston Boat Basin	Tunicata	Botryllus	schlosseri	3	yes
2003	South Slough	Charleston Boat Basin	Tunicata	Distaplia	occidentalis	5	no
2003	South Slough	Charleston Boat Basin	Tunicata	Molgula	pugetiensis	1	no
2003	South Slough	Charleston Boat Basin	Tunicata	Molgula	sp.	1	no
2004	South Slough	Charleston Bridge, float	Cirripedia	Balanus	balanus	2	no
2004	South Slough	Charleston Bridge, float	Cirripedia	Balanus	crenatus	7	no
2004	South Slough	Charleston Bridge, float	Cirripedia	Balanus	sp.	2	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Aequorea	sp.	1	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Calycella	syringa	1	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Campanulariidae		1	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Campanulinidae		1	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Obelia	dichotoma	1	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Obelia	longissima	4	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Obelia	sp.	1	no
2004	South Slough	Charleston Bridge, float	Hydrozoa	Opercularella	lacerata	2	no
2004	South Slough	Charleston Bridge, float	Nudibranchia	Dendronotus	frondosus	3	no
2003	South Slough	Charleston Bridge, pier	Bryozoa	Alcyonidium	sp.	1	no
2003	South Slough	Charleston Bridge, pier	Bryozoa	Bowerbankia	aggregata	1	no
2003	South Slough	Charleston Bridge, pier	Bryozoa	Celleporella	hyalina	1	no
2003	South Slough	Charleston Bridge, pier	Cirripedia	Balanus	crenatus	1	no
2003	South Slough	Charleston Bridge, pier	Hydrozoa	Obelia	longissima	1	no
2003	South Slough	Charleston Bridge, pier	Hydrozoa	Obelia	sp.	1	no
2003	South Slough	Charleston Bridge, pier	Nudibranchia	Hermisenda	crassicornis	1	no
2004	South Slough	Coast Guard Beach	Cirripedia	Balanus	crenatus	9	no
2004	South Slough	Coast Guard Beach	Cirripedia	Balanus	sp.	7	no

2004	South Slough	Coast Guard Beach	Hydrozoa	Campanulariidae		4		no
2004	South Slough	Coast Guard Beach	Hydrozoa	Campanulinidae		2		no
2004	South Slough	Coast Guard Beach	Hydrozoa	Clytia	hemisphaerica	3		no
2004	South Slough	Coast Guard Beach	Hydrozoa	Clytia	sp.	2		no
2004	South Slough	Coast Guard Beach	Hydrozoa	Obelia	longissima	1		no
2004	South Slough	Coast Guard Beach	Hydrozoa	Obelia	sp.	3		no
2004	South Slough	Coast Guard Beach	Hydrozoa	Thecata		1		no
2004	South Slough	Coast Guard Beach	Nudibranchia	Dendronotus	frondosus	4		no
2004	South Slough	Coast Guard Beach	Nudibranchia	Hermisenda	crassicornis	1		no
2004	South Slough	Coast Guard Beach	Nudibranchia	Janolus	fuscus	1		no
2004	South Slough	Coast Guard Beach	Nudibranchia	Onchidoris	bilamellata	4		no
2004	South Slough	Coast Guard Beach	Nudibranchia	Palio	zosteriae	1		no
2003	South Slough	Empire Pier	Bryozoa	Alcyonidium	sp.	4		no
2003	South Slough	Empire Pier	Bryozoa	Bowerbankia	aggregata	1		no
2003	South Slough	Empire Pier	Bryozoa	Bowerbankia	sp.	4		no
2003	South Slough	Empire Pier	Bryozoa	Callopora	sp.	2		no
2003	South Slough	Empire Pier	Bryozoa	Caulibugula	ciliata	4		no
2003	South Slough	Empire Pier	Bryozoa	Celleporella	hyalina	6		no
2003	South Slough	Empire Pier	Bryozoa	Cheilopora	praelonga	1		no
2003	South Slough	Empire Pier	Bryozoa	Cheilostomata		1		no
2003	South Slough	Empire Pier	Bryozoa	Conopeum	osburni	1		no
2003	South Slough	Empire Pier	Bryozoa	Conopeum	seurati	4		yes
2003	South Slough	Empire Pier	Bryozoa	Conopeum	tenuissimum	1		yes
2003	South Slough	Empire Pier	Bryozoa	Cribrilina	sp.	1		no
2003	South Slough	Empire Pier	Bryozoa	Cribrilina	sp. 1	3		no
2003	South Slough	Empire Pier	Bryozoa	Crisia	sp.	1		no
2003	South Slough	Empire Pier	Bryozoa	Dendrobeanina	lichenoides	1		no
2003	South Slough	Empire Pier	Bryozoa	Electra	sp. A	1		no
2003	South Slough	Empire Pier	Bryozoa	Microporella	californica	5		no
2003	South Slough	Empire Pier	Bryozoa	Parasmittina	sp.	2		no
2003	South Slough	Empire Pier	Bryozoa	Parasmittina	trispinosa	1	?	no
2003	South Slough	Empire Pier	Bryozoa	Schizoporella	unicornis	1		yes
2003	South Slough	Empire Pier	Bryozoa	Scruparia	sp.	1		no
2004	South Slough	Empire Pier	Cirripedia	Balanus	crenatus	2		no
2003	South Slough	Empire Pier	Cirripedia	Balanus	crenatus	5		no
2003	South Slough	Empire Pier	Cirripedia	Balanus	glandula	2	?	no
2003	South Slough	Empire Pier	Cirripedia	Balanus	improvisus	1		yes
2004	South Slough	Empire Pier	Hydrozoa	Clytia	hemisphaerica	2		no
2004	South Slough	Empire Pier	Hydrozoa	Clytia	sp.	1		no
2004	South Slough	Empire Pier	Hydrozoa	Obelia	longissima	2		no
2004	South Slough	Empire Pier	Hydrozoa	Opercularella	lacerata	1		no
2004	South Slough	Empire Pier	Hydrozoa	Thecata		1		no
2003	South Slough	Empire Pier	Hydrozoa	Tubulariidae		2		no

2004	South Slough	Empire Pier	Nudibranchia	Hermisenda	crassicornis	1	no
2003	South Slough	Empire Pier	Tunicata	Botrylloides	violaceus	1	yes
2004	South Slough	Port of Coos Bay Citrus Dock	Cirripedia	Balanus	improvisus	5	yes
2004	South Slough	Port of Coos Bay Citrus Dock	Cirripedia	Balanus	sp.	1	no
2004	South Slough	Port of Coos Bay Citrus Dock	Hydrozoa	Campanulariidae		1	no
2004	South Slough	Port of Coos Bay Citrus Dock	Hydrozoa	Ectopleura	crocea	2	yes
2004	South Slough	Port of Coos Bay Citrus Dock	Hydrozoa	Ectopleura	dumortierii	2	yes
2004	South Slough	Port of Coos Bay Citrus Dock	Hydrozoa	Tubularia	sp.	1	no
2004	South Slough	Port of Coos Bay Citrus Dock	Hydrozoa	Tubulariidae		1	no
2004	South Slough	Port of Coos Bay Citrus Dock	Tunicata	Botrylloides	violaceus	1	yes
2003	South Slough	Sengstacken Arm	Bryozoa	Bowerbankia	aggregata	4	no
2003	South Slough	Sengstacken Arm	Bryozoa	Bowerbankia	sp.	1	no
2003	South Slough	Sengstacken Arm	Cirripedia	Balanus	crenatus	5	no
2003	South Slough	Sengstacken Arm	Cirripedia	Balanus	glandula	5	no
2003	South Slough	Sengstacken Arm	Cirripedia	Balanus	improvisus	2	yes
2003	South Slough	Sengstacken Arm	Hydrozoa	Clytia	hemisphaerica	1	no
2003	South Slough	Sengstacken Arm	Hydrozoa	Laomedea	sp.	1	no
2003	South Slough	Sengstacken Arm	Hydrozoa	Obelia	longissima	1	no
2003	South Slough	Sengstacken Arm	Hydrozoa	Opercularella	sp.	1	no
2003	South Slough	Sengstacken Arm	Nudibranchia	Stiliger	sp.	1	no
2003	South Slough	Sengstacken YSI	Bryozoa	Bowerbankia	sp.	1	no
2003	South Slough	Sengstacken YSI	Cirripedia	Balanus	glandula	1	no
2003	South Slough	Sengstacken YSI	Cirripedia	Balanus	improvisus	1	yes
2003	South Slough	Valino Is YSI	Bryozoa	Alcyonidium	sp.	1	no
2003	South Slough	Valino Is YSI	Bryozoa	Bowerbankia	sp.	1	no
2003	South Slough	Valino Is YSI	Bryozoa	Bugula	pacifica	1	no
2003	South Slough	Valino Is YSI	Bryozoa	Celleporella	hyalina	1	no
2003	South Slough	Valino Is YSI	Bryozoa	Schizoporella	unicornis	1	yes
2003	South Slough	Valino Is YSI	Bryozoa	Smittoidea	prolifera	1	no
2004	South Slough	Valino Is/ Crown Pt	Cirripedia	Balanus	crenatus	7	no
2003	South Slough	Valino Is YSI	Cirripedia	Balanus	glandula	1	no
2004	South Slough	Valino Is/ Crown Pt	Cirripedia	Balanus	improvisus	1	yes
2004	South Slough	Valino Is/ Crown Pt	Cirripedia	Balanus	sp.	4	no
2003	South Slough	Valino Is YSI	Hydrozoa	Obelia	longissima	1	no
2003	South Slough	Valino Is YSI	Tunicata	Botrylloides	violaceus	1	yes
2003	South Slough	Winchester Arm	Bryozoa	Bowerbankia	aggregata	4	no
2003	South Slough	Winchester Arm	Bryozoa	Bowerbankia	sp.	1	no
2003	South Slough	Winchester Arm	Bryozoa	Celleporella	hyalina	1	no
2003	South Slough	Winchester Arm	Bryozoa	Electra	sp. A	1	no
2003	South Slough	Winchester Arm	Cirripedia	Balanus	crenatus	5	no
2003	South Slough	Winchester Arm	Cirripedia	Balanus	glandula	5	no
2003	South Slough	Winchester Arm	Hydrozoa	Campanulariidae		1	no
2003	South Slough	Winchester Arm	Hydrozoa	Obelia	longissima	4	no



2003	South Slough	Winchester Arm	Nudibranchia	Dendronotus	frondosus	3	no
2003	South Slough	Winchester Arm	Nudibranchia	Hermisenda	crassicornis	1	no
2003	South Slough	Winchester YSI	Bryozoa	Bowerbankia	aggregata	1	no
2004	South Slough	Winchester YSI	Cirripedia	Balanus	crenatus	4	no
2003	South Slough	Winchester YSI	Cirripedia	Balanus	glandula	1	no
2004	South Slough	Winchester YSI	Cirripedia	Balanus	improvisus	6	yes
2003	South Slough	Winchester YSI	Cirripedia	Balanus	improvisus	1	yes
2004	South Slough	Winchester YSI	Cirripedia	Balanus	sp.	2	no
2003	South Slough	Winchester YSI	Hydrozoa	Campanulariidae		1	no
2004	South Slough	Winchester YSI	Hydrozoa	Perigonimus	repens	10	no
2003	Olympic Coast	La Push, Quileute River	Cirripedia	Balanus	crenatus	6	no
2003	Olympic Coast	La Push, Quileute River	Cirripedia	Balanus	glandula	6	no
2003	Olympic Coast	La Push, Quileute River	Cirripedia	Balanus	improvisus	1	yes
2003	Olympic Coast	La Push, Quileute River	Hydrozoa	Campanulariidae		5	no
2003	Olympic Coast	La Push, Quileute River	Hydrozoa	Eudendrium	sp.	2	no
2003	Olympic Coast	La Push, Quileute River	Hydrozoa	Obelia	sp.	1	no
2003	Olympic Coast	La Push, Quileute River	Hydrozoa	Perigonimus	repens	2	no
2003	Olympic Coast	La Push, Quileute River	Tunicata	Perophora	annectens	1	no
2003	Olympic Coast	Neah Bay, Makah Marina	Bryozoa	Alcyonidium	sp.	2	no
2003	Olympic Coast	Neah Bay, Makah Marina	Bryozoa	Bowerbankia	sp.	2	no
2003	Olympic Coast	Neah Bay, Makah Marina	Bryozoa	Bugula	pacifica	6	no
2003	Olympic Coast	Neah Bay, Makah Marina	Bryozoa	Bugula	sp.	2	no
2003	Olympic Coast	Neah Bay, Makah Marina	Bryozoa	Celleporella	hyalina	6	no
2003	Olympic Coast	Neah Bay, Makah Marina	Bryozoa	Cribrilina	corbicula	4	no
2003	Olympic Coast	Neah Bay, Makah Marina	Cirripedia	Balanus	crenatus	3	no
2003	Olympic Coast	Neah Bay, Makah Marina	Hydrozoa	Calycella	syringa	1	no
2003	Olympic Coast	Neah Bay, Makah Marina	Hydrozoa	Campanulariidae		2	no
2003	Olympic Coast	Neah Bay, Makah Marina	Hydrozoa	Campanulinidae		1	no
2003	Olympic Coast	Neah Bay, Makah Marina	Hydrozoa	Obelia	dichotoma	1	no
2003	Olympic Coast	Neah Bay, Makah Marina	Hydrozoa	Obelia	longissima	2	no
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Botrylloides	violaceus	3	yes
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Botryllus	schlosseri	2	yes
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Corella	inflata	3	no
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Corella	sp.	1	no
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Corella	willmeriana	2	no
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Diplosoma	listerianum	6	yes
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Distaplia	occidentalis	5	no
2003	Olympic Coast	Neah Bay, Makah Marina	Tunicata	Styela	sp.	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Bryozoa	Bowerbankia	sp.	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Bryozoa	Callopora	sp. 1	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Bryozoa	Celleporella	hyalina	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Bryozoa	Crisia	occidentalis	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Bryozoa	Tricellaria	occidentalis	1	no

2004	Olympic Coast	Outer Coast, Cape Alava	Cirripedia	Balanus	balanus	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Cirripedia	Balanus	sp.	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Hydrozoa	Aequorea	sp.	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Hydrozoa	Campanulariidae		1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Hydrozoa	Clytia	sp.	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Hydrozoa	Plumularia	lagenifera	2	no
2004	Olympic Coast	Outer Coast, Cape Alava	Hydrozoa	Plumularia	sp.	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Nudibranchia	Dendronotus	frondosus	2	no
2004	Olympic Coast	Outer Coast, Cape Alava	Nudibranchia	Doto	kya	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Nudibranchia	Eubranchus	rustyus	1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Nudibranchia	Hermisenda	crassicornis	2	no
2004	Olympic Coast	Outer Coast, Cape Alava	Tunicata	Stolidobranchia		1	no
2004	Olympic Coast	Outer Coast, Cape Alava	Tunicata	Styela	sp.	1	no
2004	Olympic Coast	Outer Coast, Kalalock	Cirripedia	Balanus	crenatus	2	no
2004	Olympic Coast	Outer Coast, Kalalock	Cirripedia	Balanus	sp.	1	no
2004	Olympic Coast	Outer Coast, Kalalock	Hydrozoa	Obelia	longissima	1	no
2004	Olympic Coast	Outer Coast, Kalalock	Hydrozoa	Obelia	sp.	1	no
2004	Olympic Coast	Outer Coast, Kalalock	Nudibranchia	Dendronotus	frondosus	2	no
2004	Olympic Coast	Outer Coast, Kalalock	Nudibranchia	Hermisenda	crassicornis	2	no
2004	Olympic Coast	Outer Coast, Kalalock	Tunicata	Styela	sp.	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Bryozoa	Callopora	sp. 1	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Bryozoa	Celleporella	hyalina	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Bryozoa	Crisia	sp.	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Cirripedia	Balanus	balanus	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Cirripedia	Balanus	crenatus	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Hydrozoa	Campanulariidae		2	no
2004	Olympic Coast	Outer Coast, Makah Bay	Hydrozoa	Clytia	sp.	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Hydrozoa	Plumularia	lagenifera	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Nudibranchia	Dendronotus	frondosus	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Nudibranchia	Doto	kya	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Nudibranchia	Eubranchus	rustyus	1	no
2004	Olympic Coast	Outer Coast, Makah Bay	Nudibranchia	Hermisenda	crassicornis	2	no
2004	Olympic Coast	Outer Coast, Makah Bay	Tunicata	Styela	sp.	2	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Bryozoa	Alcyonidium	sp.	1	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Bryozoa	Celleporella	hyalina	2	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Bryozoa	Crisia	occidentalis	1	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Bryozoa	Filicrisia	franciscana	1	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Bryozoa	Parasmittina	trispinosa	1	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Bryozoa	Tricellaria	ternata	1	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Cirripedia	Balanus	crenatus	2	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Hydrozoa	Obelia	sp.	2	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Hydrozoa	Plumularia	lagenifera	1	no
2004	Olympic Coast	Outer Coast, Teawhit Head	Nudibranchia	Hermisenda	crassicornis	1	no

2004	Olympic Coast	Outer Coast, Teawhit Head	Tunicata	Styela	sp.	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Bowerbankia	sp.	2		no
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Bugula	pacifica	3		no
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Bugula	sp.	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Cribrilina	corbicula	4		no
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Cryptosula	pallasiana	2		yes
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Membranipora	villosa	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Bryozoa	Schizoporella	unicornis	3		yes
2003	Padilla Bay	Anacortes, Cap Sante	Cirripedia	Balanus	crenatus	4		no
2003	Padilla Bay	Anacortes, Cap Sante	Cirripedia	Balanus	glandula	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Hydrozoa	Clytia	sp.	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Hydrozoa	Obelia	longissima	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Tunicata	Botrylloides	sp.	1	was labeled diegensis	no
2003	Padilla Bay	Anacortes, Cap Sante	Tunicata	Botrylloides	violaceus	3		yes
2003	Padilla Bay	Anacortes, Cap Sante	Tunicata	Botryllus	schlosseri	1		yes
2003	Padilla Bay	Anacortes, Cap Sante	Tunicata	Corella	inflata	1		no
2003	Padilla Bay	Anacortes, Cap Sante	Tunicata	Corella	willmeriana	1		no
2003	Padilla Bay	Bayview Channel	Bryozoa	Bugula	pacifica	1		no
2003	Padilla Bay	Bayview Channel	Bryozoa	Celleporella	hyalina	1		no
2003	Padilla Bay	Bayview Channel	Bryozoa	Cribrilina	corbicula	2		no
2003	Padilla Bay	Bayview Channel	Bryozoa	Schizoporella	sp.	1		no
2003	Padilla Bay	Bayview Channel	Bryozoa	Schizoporella	unicornis	1		yes
2003	Padilla Bay	Bayview Channel	Bryozoa	Tubulipora	tuba	1		no
2003	Padilla Bay	Bayview Channel	Cirripedia	Balanus	crenatus	3		no
2003	Padilla Bay	Bayview Channel	Cirripedia	Balanus	improvisus	1		yes
2003	Padilla Bay	Bayview Channel	Hydrozoa	Campanulariidae		1		no
2003	Padilla Bay	Bayview Channel	Hydrozoa	Clytia	hemisphaerica	2		no
2003	Padilla Bay	Bayview Channel	Hydrozoa	Obelia	longissima	4		no
2003	Padilla Bay	Bayview Channel	Hydrozoa	Obelia	sp.	1		no
2003	Padilla Bay	Bayview Channel	Nudibranchia	Hermisenda	crassicornis	1		no
2003	Padilla Bay	Bayview Channel	Tunicata	Styela	sp.	1		no
2003	Padilla Bay	Gong	Bryozoa	Membranipora	villosa	1		no
2003	Padilla Bay	Gong	Cirripedia	Balanus	crenatus	1		no
2003	Padilla Bay	Gong	Hydrozoa	Campanulariidae		1		no
2003	Padilla Bay	Gong	Hydrozoa	Clytia	hemisphaerica	1		no
2003	Padilla Bay	Gong	Hydrozoa	Obelia	longissima	2		no
2003	Padilla Bay	Gong	Nudibranchia	Cumanotus	sp.	1		no
2003	Padilla Bay	Gong	Nudibranchia	Dendronotus	frondosus	1		no
2003	Padilla Bay	Gong	Nudibranchia	Eubbranchus	rupium	1		no
2003	Padilla Bay	Joe Leary, Fresh	Hydrozoa	Eudendrium	sp.	1		no
2003	Padilla Bay	Joe Leary, Marine	Bryozoa	Bowerbankia	sp.	1		no
2003	Padilla Bay	Joe Leary, Marine	Hydrozoa	Eudendrium	sp.	1		no

2003	Padilla Bay	La Conner Marina	Bryozoa	Bowerbankia	sp.	6	no
2003	Padilla Bay	La Conner Marina	Bryozoa	Celleporella	hyalina	5	no
2003	Padilla Bay	La Conner Marina	Bryozoa	Schizoporella	unicornis	1	yes
2003	Padilla Bay	La Conner Marina	Cirripedia	Balanus	crenatus	6	no
2003	Padilla Bay	La Conner Marina	Cirripedia	Balanus	glandula	2	no
2003	Padilla Bay	La Conner Marina	Hydrozoa	Campanulariidae		4	no
2003	Padilla Bay	La Conner Marina	Hydrozoa	Gonothyrea	sp.	1	no
2003	Padilla Bay	La Conner Marina	Hydrozoa	Laomedea	sp.	1	no
2003	Padilla Bay	La Conner Marina	Hydrozoa	Obelia	longissima	1	no
2003	Padilla Bay	La Conner Marina	Tunicata	Molgula	manhattensis	2	yes
2003	Padilla Bay	Ploug Channel	Bryozoa	Cribrilina	corbicula	2	no
2003	Padilla Bay	Ploug Channel	Bryozoa	Schizoporella	unicornis	4	yes
2003	Padilla Bay	Ploug Channel	Cirripedia	Balanus	crenatus	6	no
2003	Padilla Bay	Ploug Channel	Hydrozoa	Clytia	hemisphaerica	1	no
2003	Padilla Bay	Ploug Channel	Hydrozoa	Clytia	sp.	2	no
2003	Padilla Bay	Ploug Channel	Hydrozoa	Obelia	longissima	5	no
2003	Padilla Bay	Ploug Channel	Hydrozoa	Obelia	sp.	1	no
2003	Padilla Bay	Ploug Channel	Nudibranchia	Eubbranchus	rupium	2	no
2003	Kachemak Bay	Bear Point	Cirripedia	Balanus	crenatus	1	no
2003	Kachemak Bay	Bear Point	Cirripedia	Balanus	glandula	1	no
2003	Kachemak Bay	Bear Point	Hydrozoa	Obelia	longissima	2	no
2003	Kachemak Bay	Bear Point	Nudibranchia	Dendronotus	frondosus	1	no
2003	Kachemak Bay	Bear Point	Nudibranchia	Eubbranchus	rupium	1	no
2003	Kachemak Bay	Bear Point	Nudibranchia	Flabellina	japonica	1	no
2003	Kachemak Bay	Homer Dolphin	Bryozoa	Bowerbankia	sp.	1	no
2003	Kachemak Bay	Homer Dolphin	Bryozoa	Callopora	craticula	1	no
2003	Kachemak Bay	Homer Dolphin	Bryozoa	Tegella	armifera	1	no
2004	Kachemak Bay	Homer Dolphin	Cirripedia	Balanidae		1	no
2004	Kachemak Bay	Homer Dolphin	Cirripedia	Balanus	crenatus	1	no
2003	Kachemak Bay	Homer Dolphin	Cirripedia	Balanus	crenatus	1	no
2003	Kachemak Bay	Homer Dolphin	Cirripedia	Balanus	glandula	1	no
2004	Kachemak Bay	Homer Dolphin	Hydrozoa	Campanulariidae		1	no
2003	Kachemak Bay	Homer Dolphin	Hydrozoa	Obelia	dichotoma	1	no
2004	Kachemak Bay	Homer Dolphin	Hydrozoa	Obelia	longissima	1	no
2004	Kachemak Bay	Homer Dolphin	Hydrozoa	Sarsia	tubulosa	1	no
2004	Kachemak Bay	Homer Dolphin	Nudibranchia	Cuthona	concinna	1	no
2003	Kachemak Bay	Homer Harbor	Bryozoa	Bowerbankia	sp.	3	no
2003	Kachemak Bay	Homer Harbor	Bryozoa	Bugula	pacifica	1	no
2003	Kachemak Bay	Homer Harbor	Bryozoa	Celleporella	hyalina	5	no
2003	Kachemak Bay	Homer Harbor	Bryozoa	Cribrilina	annulata	1	no
2003	Kachemak Bay	Homer Harbor	Bryozoa	Tegella	aquilirostris	3	no
2003	Kachemak Bay	Homer Harbor	Bryozoa	Tegella	armifera	1	no
2004	Kachemak Bay	Homer Harbor	Cirripedia	Balanus	crenatus	3	no

2003	Kachemak Bay	Homer Harbor	Cirripedia	Balanus	crenatus	1		no
2003	Kachemak Bay	Homer Harbor	Cirripedia	Balanus	glandula	3		no
2004	Kachemak Bay	Homer Harbor	Hydrozoa	Calycella	syringa	1		no
2003	Kachemak Bay	Homer Harbor	Hydrozoa	Campanulariidae		1		no
2003	Kachemak Bay	Homer Harbor	Hydrozoa	Clytia	sp.	1		no
2003	Kachemak Bay	Homer Harbor	Hydrozoa	Corynidae		1		no
2004	Kachemak Bay	Homer Harbor	Hydrozoa	Cuspidella	sp.	1		no
2004	Kachemak Bay	Homer Harbor	Hydrozoa	Gonothyrea	clarki	3		no
2003	Kachemak Bay	Homer Harbor	Hydrozoa	Gonothyrea	sp.	2		no
2004	Kachemak Bay	Homer Harbor	Hydrozoa	Obelia	longissima	3		no
2003	Kachemak Bay	Homer Harbor	Hydrozoa	Obelia	longissima	2		no
2003	Kachemak Bay	Homer Harbor	Hydrozoa	Obelia	sp.	2		no
2004	Kachemak Bay	Homer Harbor	Hydrozoa	Opercularella	lacerata	1		no
2004	Kachemak Bay	Homer Harbor	Nudibranchia	Cuthona	concinna	1		no
2004	Kachemak Bay	Homer Harbor	Nudibranchia	Cuthona	pustulata	1		no
2004	Kachemak Bay	Homer Harbor	Tunicata	Distaplia	occidentalis	5	ID not verified	no
2003	Kachemak Bay	Homer Harbor	Tunicata	Distaplia	occidentalis	4		no
2003	Kachemak Bay	Homer Harbor	Tunicata	Molgula	sp.	1		no
2003	Kachemak Bay	Homer piling	Bryozoa	Alcyonidium	sp.	2		no
2003	Kachemak Bay	Homer piling	Bryozoa	Callopora	sp.	1		no
2003	Kachemak Bay	Homer piling	Bryozoa	Celleporella	hyalina	2		no
2003	Kachemak Bay	Homer piling	Bryozoa	Cribrilina	corbicula	1		no
2003	Kachemak Bay	Homer piling	Cirripedia	Balanus	crenatus	2		no
2003	Kachemak Bay	Homer piling	Cirripedia	Balanus	glandula	1		no
2003	Kachemak Bay	Homer piling	Hydrozoa	Gonothyrea	clarki	3		no
2003	Kachemak Bay	Port Graham	Bryozoa	Celleporella	hyalina	1		no
2003	Kachemak Bay	Port Graham	Hydrozoa	Campanulariidae		1		no
2003	Kachemak Bay	Seldovia Harbor	Bryozoa	Bowerbankia	sp.	5		no
2003	Kachemak Bay	Seldovia Harbor	Bryozoa	Bugula	pacifica	3		no
2003	Kachemak Bay	Seldovia Harbor	Bryozoa	Celleporella	hyalina	6		no
2003	Kachemak Bay	Seldovia Harbor	Bryozoa	Cribrilina	corbicula	2		no
2003	Kachemak Bay	Seldovia Harbor	Bryozoa	Tegella	aquilirostris	1		no
2003	Kachemak Bay	Seldovia Harbor	Bryozoa	Tegella	armifera	1		no
2004	Kachemak Bay	Seldovia Harbor	Cirripedia	Balanidae		1		no
2004	Kachemak Bay	Seldovia Harbor	Cirripedia	Balanus	crenatus	4		no
2003	Kachemak Bay	Seldovia Harbor	Cirripedia	Balanus	crenatus	4		no
2003	Kachemak Bay	Seldovia Harbor	Hydrozoa	Athecata		1		no
2004	Kachemak Bay	Seldovia Harbor	Hydrozoa	Calycella	syringa	2		no
2004	Kachemak Bay	Seldovia Harbor	Hydrozoa	Campanulariidae		2		no
2003	Kachemak Bay	Seldovia Harbor	Hydrozoa	Campanulariidae		2		no
2004	Kachemak Bay	Seldovia Harbor	Hydrozoa	Campanulinidae		1		no
2003	Kachemak Bay	Seldovia Harbor	Hydrozoa	Clytia	sp.	1		no
2004	Kachemak Bay	Seldovia Harbor	Hydrozoa	Obelia	longissima	5		no

2003	Kachemak Bay	Seldovia Harbor	Hydrozoa	Obelia	longissima	6		no
2004	Kachemak Bay	Seldovia Harbor	Hydrozoa	Obelia	sp.	1		no
2004	Kachemak Bay	Seldovia Harbor	Hydrozoa	Opercularella	lacerata	4		no
2004	Kachemak Bay	Seldovia Harbor	Nudibranchia	Dendronotus	frondosus	1		no
2003	Kachemak Bay	Seldovia Harbor	Tunicata	Ascidia	sp.	2		no
2003	Kachemak Bay	Seldovia Harbor	Tunicata	Distaplia	occidentalis	1		no
2003	Kachemak Bay	Seldovia Harbor	Tunicata	Distaplia	sp.	1		no
2003	Kachemak Bay	Seldovia Harbor	Tunicata	Molgula	pugetiensis	2		no
2003	Kachemak Bay	Seldovia Harbor	Tunicata	Molgula	sp.	1		no
2003	Kachemak Bay	Seldovia Pier	Bryozoa	Callopora	craticula	2		no
2003	Kachemak Bay	Seldovia Pier	Bryozoa	Celleporella	hyalina	2		no
2003	Kachemak Bay	Seldovia Pier	Bryozoa	Lichenopora	verrucaria	1	ID not verified	no
2004	Kachemak Bay	Seldovia Pier	Bryozoa	Reterporidae	sp.	1		no
2003	Kachemak Bay	Seldovia Pier	Bryozoa	Tegella	aquilirostris	1		no
2003	Kachemak Bay	Seldovia Pier	Bryozoa	Tegella	armifera	2		no
2004	Kachemak Bay	Seldovia Pier	Cirripedia	Balanidae		1		no
2004	Kachemak Bay	Seldovia Pier	Cirripedia	Balanus	crenatus	1		no
2003	Kachemak Bay	Seldovia Pier	Cirripedia	Balanus	crenatus	1		no
2003	Kachemak Bay	Seldovia Pier	Hydrozoa	Obelia	dichotoma	1		no
2004	Kachemak Bay	Seldovia Pier	Hydrozoa	Obelia	longissima	1		no
2003	Kachemak Bay	Seldovia Pier	Hydrozoa	Obelia	longissima	1		no
2004	Kachemak Bay	Seldovia Pier	Nudibranchia	Cuthona	pustulata	1		no
2004	Kachemak Bay	Seldovia Pier	Nudibranchia	Dendronotus	frondosus	1		no
2003	Kachemak Bay	Seldovia Pier	Nudibranchia	Dendronotus	frondosus	1		no
2003	Kachemak Bay	Seldovia piling	Cirripedia	Balanus	crenatus	2		no
2003	Kachemak Bay	Seldovia piling	Cirripedia	Balanus	glandula	1		no

**Appendix D. Nonindigenous fouling species found in this and other surveys. Note, NIS are listed for all sites combined and per site.  
Overall Species List**

<b>Broad Taxa Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In or Near</b>	<b>Seen in SERC NERRS Survey?</b>	<b>Notes</b>
Invertebrate	Chordata (Urochordata)	<i>Ascidia sp.A</i>	solitary tunicate	Tijuana River, Channel Islands	Yes	
Invertebrate	Chordata (Urochordata)	<i>Ascidia zara</i>	solitary tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay	Yes	
Invertebrate	Mollusca (Gastropoda)	<i>Babakina festiva</i>	nudibranch	Tijuana River	No	
Invertebrate	Crustacea (Cirripedia)	<i>Balanus amphitrite</i>	Striped Barnacle	Tijuana River, Channel Islands	Yes	
Invertebrate	Crustacea (Cirripedia)	<i>Balanus improvisus</i>	Bay Barnacle	Tijuana River, Elkhorn Slough/Monterey Bay; South Slough; Olympic Coast; Padilla Bay	Yes	
Invertebrate	Crustacea (Cirripedia)	<i>Balanus reticulatus</i>	barnacle	Tijuana River	Yes	
Invertebrate	Entoprocta (Kamptozoa)	<i>Barentsia benedeni</i>	kamptozoa	Elkhorn Slough/Monterey Bay; South Slough; Padilla Bay	No	
Invertebrate	Cnidaria (Hydrozoa)	<i>Blackfordia virginica</i>	hydroid and medusa		No	
Invertebrate	Chordata (Urochordata)	<i>Botrylloides perspicuum</i>	colonial tunicate	South Slough Tijuana River	Yes	
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Olympic Coast; Padilla Bay; Kachemak Bay	Yes	
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Olympic Coast; Padilla Bay	Yes	
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula "neritina"</i>	bryozoan	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough	Yes	
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula fulva (flabellata?)</i>	bryozoan	Channel Islands; Elkhorn Slough/Monterey Bay	Yes	
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula sp. 1</i>	bryozoan	Padilla Bay	No	
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula sp. 2</i>	bryozoan	Padilla Bay	No	

Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula stolonifera</i>	bryozoan	Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; Padilla Bay	Yes
Invertebrate	Crustacea (Decapoda)	<i>Carcinus maenas</i>	Green Crab	Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough	Yes
Invertebrate	Mollusca (Gastropoda)	<i>Catriona rickettsi</i>	nudibranch	Tijuana River,	No
Invertebrate	Chordata (Urochordata)	<i>Ciona intestinalis</i>	solitary tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon	Yes
Invertebrate	Chordata (Urochordata)	<i>Ciona savignyi</i>	solitary tunicate	Elkhorn Slough/Monterey Bay; Gulf of Farallon; Padilla Bay	Yes
Invertebrate	Porifera	<i>Cliona sp.</i>	Boring sponge	Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Padilla Bay; Kachemak Bay	No
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum seurati?</i>	bryozoan	Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough	Yes
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum tenuissimum</i>	bryozoan	Elkhorn Slough/Monterey Bay; South Slough	Yes
Invertebrate	Cnidaria (Hydrozoa)	<i>Cordylophora caspia</i>	Freshwater Hydroid	South Slough; Padilla Bay	No
Invertebrate	Ectoprocta (Bryozoa)	<i>Cryptosula pallasiana</i>	bryozoan	Tijuana River, Elkhorn Slough/Monterey Bay; South Slough; Padilla Bay	Yes
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene franciscana</i>	San Francisco Anemone	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon	No
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene leucolena</i>	Ghost Anemone	Elkhorn Slough; South Slough	No
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene lineata</i>	Striped Anemone	Tijuana River, Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Padilla Bay	No
Invertebrate	Chordata (Urochordata)	<i>Didemnum sp. A</i>	colonial tunicate	Elkhorn Slough/Monterey Bay; Gulf of Farallon; Padilla Bay	Yes
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Olympic Coast; Padilla Bay	Yes
Invertebrate	Cnidaria (Hydrozoa)	<i>Ectopleura crocea</i>	hydroid	Tijuana River, Elkhorn Slough/Monterey Bay; South Slough	Yes
Invertebrate	Annelida (Polychaeta)	<i>Ficopomatus enigmaticus</i>	tubeworm	, Elkhorn Slough/Monterey Bay	Yes
Invertebrate	Cnidaria (Hydrozoa)	<i>Garveia franciscana</i>	hydroid	Tijuana River; Kachemak Bay	No
Invertebrate	Porifera	<i>Halichondria bowerbankii</i>	sponge	Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough;	No



Invertebrate	Porifera	<i>Haliclona loosanoffi</i>	sponge	Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Padilla Bay	No
Invertebrate	Annelida (Polychaeta)	<i>Hydroides diramphus</i>	tubeworm	Tijuana River	No
Invertebrate	Annelida (Polychaeta)	<i>Hydroides elegans</i>	tubeworm	Tijuana River, Channel Islands	Yes
Invertebrate	Porifera	<i>Hymeniacion sp.</i>	sponge	Elkhorn Slough	No
Invertebrate	Chordata (Urochordata)	<i>Microcosmus squamiger</i>	colonial tunicate	Tijuana River, Channel Islands	Yes
Invertebrate	Chordata (Urochordata)	<i>Molgula manhattensis</i>	solitary tunicate	Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Padilla Bay	Yes
Invertebrate	Chordata (Urochordata)	<i>Molgula sp. A</i>	colonial tunicate	Tijuana River	Yes
Invertebrate	Cnidaria (Scyphozoa)	<i>Phyllorhiza punctata</i>	Australian Spotted Jellyfish and polyp	Tijuana River	No
Invertebrate	Chordata (Urochordata)	<i>Polyandrocarpa zorritensis</i>	colonial tunicate	Tijuana River	Yes
Invertebrate	Ectoprocta (Bryozoa)	<i>Schizoporella unicornis?</i>	bryozoan	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Padilla Bay; Kachemak Bay	Yes
Invertebrate	Chordata (Urochordata)	<i>Styela canopus</i>	solitary tunicate	Tijuana River	No
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough; Padilla Bay	Yes
Invertebrate	Chordata (Urochordata)	<i>Styela plicata</i>	solitary tunicate	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay	Yes
Invertebrate	Chordata (Urochordata)	<i>Symplegma reptans</i>	solitary tunicate	Elkhorn Slough/Monterey Bay; South Slough	Yes
Invertebrate	Mollusca (Gastropoda)	<i>Tenellia adspersa</i>	nudibranch	Elkhorn Slough; Monterey Bay	Yes
Invertebrate	Ectoprocta (Bryozoa)	<i>Victorella "pavida"</i>		Tijuana River, Elkhorn Slough/Monterey Bay	Yes
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora arcuata</i>	bryozoan	Tijuana River, Channel Islands	Yes
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora subtorquata</i>	bryozoan	Tijuana River, Channel Islands; Elkhorn Slough/Monterey Bay; Gulf of Farallon; South Slough	Yes

Invertebrate	Cnidaria (Hydrozoa)	<i>Zanclaea costata</i>	hydroid & medusa	Gulf of Farallon	No	in Carlton 1979, could change to cryptogenic, regarded as "circumglobal" but hydroid found on bivalves
Invertebrate	Ectoprocta (Bryozoa)	<i>Zoobotryon verticillatum</i>	bryozoan	Tijuana River	Yes	

**Appendix D continued, Tijuana River**

<b>Broad Taxa Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge proper?</b>
Invertebrate	Ectoprocta (Bryozoa)	<i>Victorella "pavida"</i>		Yes (Tijuana River, Model Marsh)
Invertebrate	Chordata (Urochordata)	<i>Ascidia sp.A</i>	solitary tunicate	No
Invertebrate	Chordata (Urochordata)	<i>Ascidia zara</i>	solitary tunicate	No
Invertebrate	Mollusca (Gastropoda)	<i>Babakina festiva</i>	nudibranch	?
Invertebrate	Crustacea (Cirripedia)	<i>Balanus amphitrite</i>	Striped Barnacle	Yes (Model Marsh; Oneonta Slough)
Invertebrate	Crustacea (Cirripedia)	<i>Balanus improvisus</i>	Bay Barnacle	Yes (Oneonta Slough)
Invertebrate	Crustacea (Cirripedia)	<i>Balanus reticulatus</i>		No
Invertebrate	Chordata (Urochordata)	<i>Botrylloides perspicuum</i>	colonial tunicate	
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	No
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	No
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula "neritina"</i>	bryozoan	No
Invertebrate	Mollusca (Gastropoda)	<i>Catirona rickettsi</i>	nudibranch	?
Invertebrate	Chordata (Urochordata)	<i>Ciona intestinalis</i>	solitary tunicate	No
Invertebrate	Chordata (Urochordata)	<i>Ciona savignyi</i>	solitary tunicate	No
Invertebrate	Ectoprocta (Bryozoa)	<i>Cryptosula pallasiana</i>	bryozoan	?
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene franciscana</i>	San Francisco Anemone	?
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene lineata</i>	Striped Anemone	?
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	?
Invertebrate	Cnidaria (Hydrozoa)	<i>Ectopleura crocea</i>	hydroid	?
Invertebrate	Cnidaria (Hydrozoa)	<i>Garveia franciscana</i>	hydroid	?

Invertebrate	Annelida (Polychaeta)	<i>Hydroides diramphus</i>	tubeworm	?
Invertebrate	Annelida (Polychaeta)	<i>Hydroides elegans</i>	tubeworm	?
Invertebrate	Chordata (Urochordata)	<i>Microcosmus squamiger</i>	colonial tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Molgula sp. A</i>	colonial tunicate	?
Invertebrate	Cnidaria (Scyphozoa)	<i>Phyllorhiza punctata</i>	Australian Spotted Jellyfish & polyp	?
Invertebrate	Chordata (Urochordata)	<i>Poly&amp;rocarpa zorritensis</i>	colonial tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Styela canopus</i>	solitary tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Styela plicata</i>	solitary tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Symplegma reptans</i>	solitary tunicate	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora arcuata</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora subtorquata</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Zoobotryon verticillatum</i>	bryozoan	?
Invertebrate	Cnidaria (Anthozoa)	<i>Bunodeopsis sp.</i>	anemone	San Diego/Mission Bays

<b>In Adjacent Area</b>	<b>Established?</b>	<b>References</b>	<b>Notes</b>
No?	Yes	SERC	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
La Jolla/CA/Pacific Ocean	Yes	Carlton 1979	
La Jolla/CA/Pacific Ocean; San Diego/CA/San Diego Bay; San Diego/CA/Mission Bay	Yes	Carlton et al. 1969; Carlton 1979; Cohen & Carlton 1995; Cohen et al. 2002; SERC	
Yes- 1939, on buoy, San Diego Bay, single record	Unknown	Carlton 1979; SERC	
Sunroad Marina/CA/San Diego Bay	Unknown	SERC	
Yes			
San Diego-Mission Bays	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; Cohen et al. 2002; SERC	
La Jolla/CA/Pacific Ocean	Yes	Cohen & Carlton 1995	
San Diego-Mission Bays	Yes	Carlton 1979; Cohen et al. 2002; Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; Cohen et al. 2002; Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; Cohen & Carlton 1995; Cohen et al. 2000	
San Diego-Mission Bays	Yes	Crooks 1998	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; Crooks 1998; Ruiz et al., unpublished data	
San Diego Bay	Unknown	Ruiz et al., unpublished data	(1st records for San Diego Bay?. This is an unusual habitat for this low-salinity form.

San Diego-Mission Bays	Yes	Cohen et al. 2002; Ruiz et al., unpublished data	
San Diego-Mission Bays	Yes	Carlton 1979; Crooks 1998	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003	
San Diego-Mission Bays	Yes	SERC, Lambert, pers. comm.	
San Diego-Mission Bays	Yes	Larson & Arneson 1990	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Lambert & Lambert 2003; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; SERC	
San Diego-Mission Bays	Yes	Crooks 1998; Cohen et al. 2002; SERC	
San Diego-Mission Bays	Yes	Carlton 1979; Crooks 1998; SERC	
Yes	Yes	Crooks 1998; Crooks, personal communication	Introduced or cryptogenic?

**Appendix D continued, Channel Islands**

<b>Broad Taxa Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge?</b>
Invertebrate	Chordata (Urochordata)	<i>Ascidia sp.A</i>	solitary tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Ascidia zara</i>	solitary tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Crustacea (Cirripedia)	<i>Balanus amphitrite</i>	Striped Barnacle	?
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula "neritina"</i>	bryozoan	?
	Ectoprocta (Bryozoa)	<i>Bugula fulva?</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula stolonifera</i>	bryozoan	?
Invertebrate	Chordata (Urochordata)	<i>Ciona intestinalis</i>	solitary tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Ciona savignyi</i>	solitary tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene franciscana</i>	San Francisco Anemone	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	?
Invertebrate	Annelida (Polychaeta)	<i>Hydroides elegans</i>	tubeworm	?
Invertebrate	Chordata (Urochordata)	<i>Microcosmus squamiger</i>	colonial tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Molgula manhattensis</i>	solitary tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Styela plicata</i>	solitary tunicate	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Chordata (Urochordata)	<i>Watersipora arcuata</i>	bryozoan	Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora subtorquata</i>	bryozoan	?

<b>In Adjacent Area</b>	<b>Established?</b>	<b>References</b>
Ventura/CA, Port Hueneme/CA	Yes	Lambert & Lambert 2003;
Ventura/CA, Port Hueneme/CA;	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC
'Ventura West harbor;	Yes	SERC
Ventura/CA, Port Hueneme/CA; Anacapa Island (Channel Islands)/CA/Anacapa Islands Harbor	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC
Ventura/CA, Port Hueneme/CA;	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC
Ventura West harbor;	Yes	SERC
Vintage Marina, Oxnard		
Ventura West harbor;	Yes	SERC
Vintage Marina, Oxnard		
Ventura West harbor;	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC
Vintage Marina, Oxnard	Yes	Cohen et al. 2002; Lambert & Lambert 2003; SERC
Vintage Marina, Oxnard	Yes	Carlton 1979; Cohen & Carlton 1995; Cohen et al. 2000
?	Yes	
Ventura West harbor;	Yes	SERC
Vintage Marina, Oxnard		
'Ventura West harbor;	Yes	Carlton 1979; SERC
Ventura/CA, Port Hueneme/CA;		Lambert & Lambert 2003
Ventura/CA	Yes	Lambert & Lambert 2003; SERC
Ventura West harbor;	Yes	Lambert & Lambert 2003; SERC
Vintage Marina, Oxnard;		
Port Hueneme/CA;	Yes	Lambert & Lambert 2003; SERC
Ventura West harbor;		
Vintage Marina, Oxnard;		
Port Hueneme/CA;		Cohen et al. 2000; SERC
Ventura West harbor;	Yes	SERC
Vintage Marina, Oxnard;		



**Appendix D continued, Elkhorn Slough and Monterey Bay**

**Broad Taxa**

<b>Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge proper?</b>
Invertebrate	Ectoprocta (Bryozoa)	<i>Victorella pavida</i>	bryozoan	Yes(Elkhorn Slough- Moss Landing, North; Kirby Park)
Invertebrate	Chordata	<i>Ascidia zara</i>	solitary tunicate	Elkhorn Slough
Invertebrate	Crustacea (Cirripedia)	<i>Balanus improvisus</i>	Bay Barnacle	Elkhorn Slough
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Monterey Bay, Elkhorn Slough; Monterey Marina/CA/Monterey Bay; Santa Cruz Harbor/CA/Monterey Bay
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	Elkhorn Slough; Monterey Marina/CA/Monterey Bay; Santa Cruz Harbor/CA/Monterey Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula "neritina"</i>	bryozoan	Elkhorn Slough; Monterey Marina/CA/Monterey Bay; Santa Cruz Harbor/CA/Monterey Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula fulva</i>	bryozoan	Monterey Marina/CA/Monterey Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula stolonifera</i>	bryozoan	Elkhorn Slough; Monterey Marina/CA/Monterey Bay; Santa Cruz Harbor/CA/Monterey Bay
Invertebrate	Crustacea (Decapoda)	<i>Carcinus maenas</i>	Green Crab	Monterey Bay, Elkhorn Slough
Invertebrate	Porifera	<i>Cliona sp.</i>	Boring sponge	Elkhorn Slough
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum seurati?</i>	bryozoan	Azevedo Pond; Hudson Landing West
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum tenuissimum</i>	bryozoan	Elkhorn Slough
Invertebrate	Ectoprocta (Bryozoa)	<i>Cryptosula pallasiana</i>	bryozoan	Elkhorn Slough; Monterey Bay
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene franciscana</i>	San Francisco Anemone	Elkhorn Slough
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene leucolena</i>	Ghost Anemone	Elkhorn Slough
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene lineata</i>	Striped Anemone	Elkhorn Slough
Invertebrate	Chordata (Urochordata)	<i>Didemnum sp.</i>	colonial tunicate	Elkhorn Slough
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	Elkhorn Slough; Monterey Bay
Invertebrate	Cnidaria (Hydrozoa)	<i>Ectopleura crocea</i>	hydroid	Elkhorn Slough
Invertebrate	Annelida (Polychaeta)	<i>Ficopomatus enigmaticus</i>	tubeworm	Elkhorn Slough
Invertebrate	Porifera	<i>Halichondria bowerbankii</i>	sponge	Elkhorn Slough
Invertebrate	Porifera	<i>Haliclona loosanoffi</i>	sponge	Elkhorn Slough; Monterey Bay
Invertebrate	Porifera	<i>Hymeniacidon sp.</i>	sponge	Elkhorn Slough
Invertebrate	Chordata (Urochordata)	<i>Molgula manhattensis</i>	solitary tunicate	Elkhorn Slough; Monterey Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Schizoporella unicornis?</i>	bryozoan	Elkhorn Slough; Monterey Bay
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	Elkhorn Slough; Monterey Bay
Invertebrate	Chordata (Urochordata)	<i>Styela plicata</i>	solitary tunicate	Elkhorn Slough
Invertebrate	Mollusca (Gastropoda)	<i>Tenellia adspersa</i>	nudibranch	Elkhorn Slough; Monterey Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora subtorquata</i>	bryozoan	Elkhorn Slough; Monterey Bay

In Adjacent Area	Established	References	Notes
?	Yes	SERC	
?	Yes	SERC	
Yes	Yes	Wasson et al. 2001; SERC	
?	Yes	Wasson et al. 2001; SERC	
?	Yes	Wasson et al. 2001; SERC	
	Yes	Wasson et al. 2001; SERC	
?	Unknown	SERC Wasson et al. 2001; SERC	Uncertain ID- could be <i>flabellata</i> ?
Yes	Yes	Grosholz & Ruiz 1995; Miller 1996; Ruiz et al. 1998	
?	Yes	Wasson et al. 2001	
?	Yes	SERC	Taxonomically difficult, but apparently introduced
?	Yes	Wasson et al. 2001	
Yes	Yes	Wasson et al. 2001; SERC	
?	Yes	Wasson et al. 2001	
?	Yes	Wasson et al. 2001	
?	Yes	Carlton 1979; Wasson et al. 2001	
?	Yes	Lambert, pers. comm.; SERC	
Yes	Yes	SERC	
Yes	Yes	Carlton 1979; Wasson et al. 2001	
?	Yes	Wasson et al. 2001; SERC	
?	Yes	Wasson et al. 2001	
?	Yes	Wasson et al. 2001	
?	Yes	Wasson et al. 2001	
?	Yes	Wasson et al. 2001; SERC	
Yes	Yes	Wasson et al. 2001; SERC	Identity of this species is unclear.
?	Yes	Carlton 1979; Wasson et al. 2001; SERC	
?	Yes	SERC	
?	Yes	Carlton 1979; Wasson et al. 2001; SERC	
?	Yes	Wasson et al. 2001; SERC	

**Appendix D continued, Gulf of Farallones**

<b>Broad Taxa Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge?</b>
Invertebrate	Chordata (Urochordata)	<i>Ascidia zara</i>	solitary tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula "neritina"</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula flabellata</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula stolonifera</i>	bryozoan	?
Invertebrate	Crustacea (Decapoda)	<i>Carcinus maenas</i>	Green Crab	?
Invertebrate	Chordata (Urochordata)	<i>Ciona intestinalis</i>	solitary tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Ciona savignyi</i>	solitary tunicate	?
Invertebrate	Porifera	<i>Cliona sp.</i>	Boring sponge	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum seurati?</i>	bryozoan	?
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene franciscana</i>	San Francisco Anemone	?
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene lineata</i>	Striped Anemone	?
Invertebrate	Chordata (Urochordata)	<i>Didemnum sp.</i>	colonial tunicate	?
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	?
Invertebrate	Porifera	<i>Halichondria bowerbankii</i>	sponge	?
Invertebrate	Porifera	<i>Haliclona loosanoffi</i>	sponge	?
Invertebrate	Chordata (Urochordata)	<i>Molgula manhattensis</i>	solitary tunicate	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Schizoporella unicornis?</i>	bryozoan	?
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora subtorquata</i>	bryozoan	?
Invertebrate	Cnidaria (Hydrozoa)	<i>Zanclaea costata</i>	hydroid & medusa	?

<b>In Adjacent Area</b>	<b>Established</b>	<b>References</b>	<b>Notes</b>
Tomales Bay; Bodega Bay; Mason's Marina/CA/Bodega Bay	Yes	Fairey et al. 2002; SERC	
Tomales Bay; Bodega Bay	Yes	Fairey et al. 2002; SERC	
Tomales Bay; Bodega Bay	Yes	Fairey et al. 2002; SERC	
Tomales Bay; Bodega Bay	Yes	Fairey et al. 2002; SERC	
	Yes	SERC	
Mason's marina/CA/Bodega Bay; Porto Bodega marina/CA/Bodega Bay	Yes	SERC	
Tomales Bay; Bodega Bay	Yes	Grosholz & Ruiz 1995; Miller 1996; Ruiz et al. 1998	
Tomales Bay; Bodega Bay	Yes	Fairey et al. 2002; SERC	
Tomales Bay	Yes	Fairey et al. 2002; SERC	CHECK
Tomales Bay	Yes	Carlton 1979; Cohen & Carlton 1995	
Mason's marina/CA/Bodega Bay; Porto Bodega marina/CA/Bodega Bay	Yes	SERC	Taxonomically difficult, but apparently introduced
Tomales Bay	Yes	Cohen & Carlton 1995	
Tomales Bay; Bodega Bay	Yes	Carlton 1979; Wasson et al. 2001	
Tomales Bay; Bodega Bay	Yes	Ruiz et al. unpublished; Lambert, pers. comm., SERC	
Tomales Bay; Bodega Bay	Yes	SERC	
Tomales Bay	Yes	Fairey et al. 2002	
Tomales Bay	Yes	Fairey et al. 2002	
Tomales Bay; Bodega Bay	Yes	SERC	
Tomales Bay; Bodega Bay	Yes	Carlton 1979; Fairey et al. 2002; SERC	Identity of this species is unclear.
Bodega Bay	Yes	Fairey et al. 2002	
Tomales Bay; Bodega Bay	Yes	Cohen & Carlton 1995; SERC	
Bodega Bay	Yes	Carlton 1979	

**Appendix D continued, South Slough**

**Broad Taxa**

<b>Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge?</b>
Invertebrate	Crustacea (Cirripedia)	<i>Balanus improvisus</i>	Bay Barnacle	Coos Bay/OR/South Slough; Sengstocken Arm; Empire Boat Ramp; Charleston Boat Basin; Winchester; Port of Coos Bay; Citrus Dock; Valino Is; Crown Pt
Invertebrate	Entoprocta (Kamptozoa)	<i>Barentsia benedeni</i>	kamptozoon	?
Invertebrate	Cnidaria (Hydrozoa)	<i>Blackfordia virginica</i>	hydroid and medusa	
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Coos Bay; Coos Bay/OR/South Slough; Empire Boat Ramp; Charleston Boat Basin/OR/South Slough; Valino Is/ Crown Pt
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	Coos Bay; Charleston Boat Basin/OR/South Slough
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula "neritina"</i>	bryozoan	?
Invertebrate	Crustacea (Decapoda)	<i>Carcinus maenas</i>	Green Crab	Coos Bay
Invertebrate	Porifera	<i>Cliona sp.</i>	Boring sponge	Coos Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum seurati?</i>	bryozoan	Empire Boat Ramp; Charleston Boat Basin
Invertebrate	Ectoprocta (Bryozoa)	<i>Conopeum tenuissimum</i>	bryozoan	Coos Bay; 'Empire Boat Ramp
Invertebrate	Cnidaria (Hydrozoa)	<i>Cordylophora caspia</i>	Freshwater Hydroid	
Invertebrate	Ectoprocta (Bryozoa)	<i>Cryptosula pallasiana</i>	bryozoan	Charleston Boat Basin
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene leucolena</i>	Ghost Anemone	Coos Bay
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene lineata</i>	Striped Anemone	Coos Bay
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	Isthmus Slough (Coos Bay)
Invertebrate	Cnidaria (Hydrozoa)	<i>Ectopleura crocea</i>	hydroid	Coos Bay
Invertebrate	Porifera	<i>Halichondria bowerbankii</i>	sponge	Coos Bay
Invertebrate	Porifera	<i>Haliclona loosanoffi</i>	sponge	Coos Bay
Invertebrate	Chordata (Urochordata)	<i>Molgula manhattensis</i>	solitary tunicate	Isthmus Slough (Coos Bay)
Invertebrate	Ectoprocta (Bryozoa)	<i>Schizoporella unicornis?</i>	bryozoan	Coos Bay/OR/Charlestown Boat Basin
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	Coos Bay/OR/Inner Boat Basin
Invertebrate	Mollusca (Gastropoda)	<i>Tenellia adpersa</i>	nudibranch	Coos Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Watersipora subtorquata</i>	bryozoan	Coos Bay

In Adjacent Area	Established	References	Notes
Yes, OR/Coos Bay	Yes	Carlton 1979; Carlton 1989; Cohen & Carlton 1995; Wonham et al. 2005; SERC	
Yes, Coos Bay/OR/Isthmus Slough	Yes	Carlton 1989; Wasson 1997	
Yes, Coos Bay/OR/Isthmus Slough	Yes	Ruiz et al. 2000; Wonham et al. 2005	
Yes	Yes	Hewitt et al. 1993; Ruiz et al. 2000, SERC; Carlton, unpublished data;	
Yes	Yes	Hewitt et al. 1993; Ruiz et al. 2000, SERC; Carlton, unpublished data;	
Coos Bay	Yes	Cohen & Carlton 1995; Carlton 1989; Carlton unpublished data	
Yes	Yes	Ruiz et al. 1998	
Yes		Carlton 1979; Cohen et al. 1998	
?	Yes	SERC	Taxonomically difficult, but apparently introduced
?	Yes	Wasson et al. 2001	
Coos Bay/OR/Coos River	Yes	Ruiz et al. 2000; Carlton unpublished data	
Coos Bay	Yes	Ruiz et al. 2000; Carlton unpublished data; SERC	
?	Yes	Carlton 1979; Cohen & Carlton 1995	
?	Yes	Carlton 1979; Cohen & Carlton 1995	
Yes	Yes	Hewitt 1993	
Yes	Yes	Carlton 1979; Wonham et al. 2005	
?	Yes	Carlton 1979; Wonham et al. 2005	
?	Yes	Carlton 1979; Wonham et al. 2005	
?	Yes	Carlton 1979; Wonham et al. 2005	
?	Yes	Carlton 1989; Cohen & Carlton 1995; Wonham et al. 2005	Identity of this species is unclear.
?	Yes	Cohen & Carlton 1995;	
?	Yes	Wonham et al. 2005	
?	Yes	Wonham et al. 2005	

**Appendix D continued, Olympic Coast**

<b>Broad Taxa Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge?</b>	<b>In Adjacent Area</b>	<b>Established?</b>	<b>References</b>	<b>Notes</b>
Invertebrate	Crustacea (Cirripedia)	<i>Balanus improvisus</i>	Bay Barnacle	La PushWA/La Push Harbor	No?	Unknown	SERC	
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Neah Bay	Willapa Bay	Yes	Cohen et al. 2000; SERC	
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	Neah Bay	Willapa Bay	Yes	Cohen et al. 2000; SERC	
Invertebrate	Crustacea (Decapoda)	<i>Carcinus maenas</i>	Green Crab	?	Grays Harbor; Willapa Bay	Unknown	Cohen et al. 2000	
Invertebrate	Chordata (Urochordata)	<i>Diplosoma listerianum</i>	colonial tunicate	Neah Bay	Willapa Bay	Yes	SERC	

**Appendix D continued, Padilla Bay**

<b>Broad Taxa Group</b>	<b>Phylum</b>	<b>Species</b>	<b>Common Name</b>	<b>In Refuge?</b>
Invertebrate	Crustacea (Cirripedia)	<i>Balanus improvisus</i>	Bay Barnacle	Bayview Channel
Invertebrate	Entoprocta (Kamptozoa)	<i>Barentsia benedeni</i>	kamptozoa	?
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Anacortes/WA/ Padilla Bay
Invertebrate	Chordata (Urochordata)	<i>Botryllus schlosseri</i>	colonial tunicate	Anacortes/WA/ Padilla Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula sp. 1</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula sp. 2</i>	bryozoan	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Bugula stolonifera</i>	bryozoan	?
Invertebrate	Chordata (Urochordata)	<i>Ciona savignyi</i>	solitary tunicate	?
Invertebrate	Cnidaria (Hydrozoa)	<i>Cladonema radiatum</i>	hydroid & medusa	WA/Padilla Bay
Invertebrate	Porifera	<i>Cliona sp.</i>	Boring sponge	?
Invertebrate	Cnidaria (Hydrozoa)	<i>Cordylophora caspia</i>	Freshwater Hydroid	?
Invertebrate	Ectoprocta (Bryozoa)	<i>Cryptosula pallasiana</i>	bryozoan	WA/Padilla Bay
Invertebrate	Cnidaria (Anthozoa)	<i>Diadumene lineata</i>	Striped Anemone	WA/Padilla Bay
Invertebrate	Chordata (Urochordata)	<i>Didemnum sp. A</i>	colonial tunicate	?
Invertebrate	Porifera	<i>Haliclona loosanoffi</i>	sponge	?
Invertebrate	Chordata (Urochordata)	<i>Molgula manhattensis</i>	solitary tunicate	WA/Padilla Bay
Invertebrate	Ectoprocta (Bryozoa)	<i>Schizoporella unicornis?</i>	bryozoan	WA/Padilla Bay
Invertebrate	Chordata (Urochordata)	<i>Styela clava</i>	solitary tunicate	Anacortes/WA/ Puget Sound



In Adjacent Area	Established in refuge	References	Notes
No?	Unknown	SERC	
Yes, WA/Puget Sound	Yes	Cohen et al. 1998	
Puget Sound	Yes	Cohen et al. 1998; Cohen et al. 2000; Lambert 2003	
Puget Sound	Yes	Cohen et al. 1998; Cohen et al. 2000; Lambert 2003	
Puget Sound	Yes	Cohen et al. 1998	Resembles <i>B. turrita</i> .
Puget Sound	Yes	Cohen et al. 1998	Resembles <i>B. fulva</i>
Puget Sound	Yes	Cohen et al. 1998	
Puget Sound	Yes	Fairey et al. 2002; SERC	CHECK
?	Yes	Cohen et al. 1998	
Puget Sound		Carlton 1979; Cohen et al. 1998	
Edison/WA/Samish River; Seattle/WA/Elliott Bay	Yes	Ruiz et al. 2000; Carlton unpublished data	
Puget Sound	Yes	Cohen et al. 1998; SERC	
Puget Sound	Yes	Carlton 1979; Cohen et al. 1998	
Puget Sound	Yes	Woods Hole Marine Science Center 2005	
Puget Sound	Yes	Carlton 1979; Cohen et al. 1998; Wonham et al. 2005	
Puget Sound	Yes	Cohen et al. 1998; Wonham et al. 2005; SERC	
Puget Sound	Yes	Cohen et al. 1998; Wonham et al. 2005; SERC	Identity of this species is unclear.
Puget Sound	Yes	Cohen et al. 1998; Wonham et al. 2005	

Appendix D continued, Kachemak Bay

Broad Taxa Group	Phylum	Species	Common Name	In Refuge?	In Adjacent Area	Established	References	Notes
Invertebrate	Chordata (Urochordata)	<i>Botrylloides violaceus</i>	colonial tunicate	Kachemak Bay	Prince William Sound	Yes	Ruiz et al., unpublished data; SERC	
Invertebrate	Porifera	<i>Cliona sp.</i>	Boring sponge	?	Prince William Sound	Yes	Hines & Ruiz 2000	
Invertebrate	Cnidaria (Hydrozoa)	<i>Garveia franciscana</i>	hydroid	Kachemak Bay		Unknown	Hines & Ruiz 2001	This record seems puzzling for this warm-water species.
Invertebrate	Ectoprocta (Bryozoa)	<i>Schizoporella unicornis?</i>	bryozoan	?	Prince William Sound	Yes	Hines & Ruiz 2000	Identity of this species is unclear.

# EXOTICS IN ELKHORN SLOUGH ESTUARINE HABITATS

*A list of documented non-native species compiled by Kerstin Wasson  
Elkhorn Slough National Estuarine Research Reserve*

INVERTEBRATES	FISH
<p><b>PORIFERA</b>  <i>*Cliona ?celata/lobata</i>  <i>*Halichondria bowerbanki</i>  <i>Haliclona loosanoffi</i>  <i>*Hymeniacion sinapium</i></p> <p><b>ANNELIDA: POLYCHAETA</b>  <i>Ficopomatus enigmaticus</i>  <i>Heteromastus filiformis</i>  <i>Polydora ligni</i>  <i>Pseudopolydora paucibranchiata</i>  <i>Streblospio benedicti</i></p> <p><b>ARTHROPODA: CRUSTACEA</b>  <b>CIRRIPEDIA</b>  <i>Balanus improvisus</i>  <b>COPEPODA</b>  <i>Mytilicola orientalis</i>  <b>MALACOSTRACA</b>  <b>ISOPODA</b>  <i>Iais californica</i>  <i>Limnoria quadripunctata</i>  <i>Sphaeroma quoyanum</i>  <b>TANAIDA</b>  <i>Sinelobus</i> sp.  <b>AMPHIPODA</b>  <i>Ampithoe valida</i>  <i>Caprella mutica</i>  <i>Grandidierella japonica</i>  <i>Jassa marmorata</i>  <i>Melita nitida</i>  <i>Monocorophium acherusicum</i>  <i>Monocorophium insidiosum</i>  <i>Monocorophium uenoi</i>  <i>Parapleustes derzhavini</i>  <b>DECAPODA</b>  <i>Carcinus maenas</i>  <i>Palaemon macrodactylus</i></p> <p><b>PLATYHELMINTHES</b>  <i>Cercaria batillariae</i></p>	<p><b>CNIDARIA</b>  <i>Cordylophora caspia</i>  <i>Diadumene franciscana</i>  <i>Diadumene leucolena</i>  <i>Diadumene lineata</i>  <i>Ectopleura crocea</i>  <i>Sarsia tubulosa</i></p> <p><b>BRYOZOA</b>  <i>Amathia vidovici</i>  <i>Bowerbankia gracilis</i>  <i>*Bugula neritina</i>  <i>Bugula stolonifera</i>  <i>Conopeum tenuissimum</i>  <i>*Cryptosula pallasiana</i>  <i>*Schizoporella unicornis</i>  <i>Watersipora subtorquata</i></p> <p><b>KAMPTOZOA</b>  <i>Barentsia benedeni</i></p> <p><b>MOLLUSCA</b>  <b>BIVALVIA</b>  <i>Gemma gemma</i>  <i>Lyrodus pedicellatus</i>  <i>Musculista senhousia</i>  <i>Mya arenaria</i>  <i>*Mytilus galloprovincialis</i>  <i>Nuttallia obscurata</i>  <i>Venerupis philippinarum</i>  <b>GASTROPODA</b>  <i>Batillaria attramentaria</i>  <i>Myosotella myosotis</i>  <i>Okenia plana</i>  <i>Philine ?auriformis</i>  <i>Tenellia adspersa</i>  <i>Urosalpinx cinerea</i></p> <p><b>CHORDATA: UROCHORDATA</b>  <i>Botrylloides violaceus</i>  <i>*Molgula manhattensis</i>  <i>Styela clava</i></p>
	<p>Yellowfin Goby <i>Acanthogobius flavimanus</i>            American Shad <i>Alosa sapidissima</i>            Striped Bass <i>Morone saxatilis</i></p>
	<b>ALGAE</b>
	<p><i>Caulacanthus ustulatus</i>  <i>Sargassum muticum</i></p>
	<b>PLANTS</b>
	<p><i>Ammophila arenaria</i>  <i>Arundo donax</i>  <i>Atriplex semibaccata</i>  <i>Cakile edentula</i>  <i>Cakile maritima</i>  <i>Carpobrotus chilense</i>  <i>Carpobrotus edulis</i>  <i>Chenopodium macrospermum</i>  <i>Conium maculatum</i>  <i>Cotula coronopifolia</i>  <i>Mesembryanthemum nodiflorum</i>  <i>Spergularia bocconii</i>  <i>Tetragonia tetragoniodes</i></p>

Data Sources: the 58 non-native invertebrate species are documented in a recent paper by K. Wasson, K. Fenn, and J. Pearse (Biological Invasions). Those marked with an asterisk (\*) are also found in rocky intertidal habitats in central California; no additional non-native invertebrates were found in extensive surveys. The three non-native fish species were reported by G. Cailliet (Moss Landing Marine Laboratories); the two algae have been noted by K. Wasson (ESNERR) and K. Heiman (Stanford University). The plant list was supplied by A. Woolfolk (ESNERR).

TRNERR Wetland NIS

Appendix E. Wetland and marine NIS found in Elkhorn Slough and TRNERR and its surrounding bays				
Species			Primary Habitat Association	
			Marine / Estuarine	Terrestrial / Riparian
<b>PLANTS</b>				
	<i>Arundo donax</i>	Giant reed		x
	<i>Brassica nigra</i>	Black mustard	x	x
	<i>Brassica tournefortii</i>	Sahara mustard		x
	<i>Bromus madritensis</i> ssp. <i>rubens</i>	Foxtail		x
	<i>Carpobrotus edulis</i>	Hottentot fig		x
	<i>Chrysanthemum coronarium</i>	Crown daisy		x
	<i>Lepidium latifolium</i>	Perennial pepperweed		x
	<i>Malephora crocea</i>	Iceplant		x
	<i>Mesembryanthemum crystallinum</i>	Crystalline iceplant		x
	<i>Mesembryanthemum nodiflorum</i>	Slender-leaf iceplant		x
	<i>Myoporum laetum</i>	Myoporum		x
	<i>Polypogon monspeliensis</i>	Rabbitfoot		x
	<i>Ricinus communis</i>	Castor bean		x
	<i>Rumex crispus</i>	Curly dock		x
	<i>Schinus terebinthifolius</i>	Brazilian pepper		x
	<i>Tamarix</i> spp.	Salt cedar		x
<b>BRYOZOAN</b>				
	<i>Victorella pavida</i>	Added by this study	x	
<b>OLIGOCHAETES</b>				
	<i>Tubificoides brownea</i>		x	
<b>POLYCHAETES</b>				
	<i>Pseudopolydora paucibranchiata</i>		x	
	<i>Streblospio benedicti</i>		x	
<b>AMPHIPODS</b>				
	<i>Grandidierella japonica</i>		x	
	<i>Jassa mamorata</i> (=falcata)		x	
<b>ISOPODS</b>				
	<i>Armadillidium vulgare</i>	Pillbug		x
	<i>Oniscus asellus</i>	Woodlouse		x
<b>BARNACLES</b>				
	<i>Balanus amphitrite</i>	Striped barnacle	x	
	<i>Balanus improvisus</i>	Added by this study	x	
<b>SHRIMP</b>				
	<i>Palaemon macrodactylus</i>	Oriental grass shrimp	x	
<b>INSECTS</b>				
	<i>Forficula auricularia</i>	Earwig		x
	<i>Linepithema humile</i>	Argentine ant		x
<b>GASTROPODS</b>				
	<i>Helix aperta</i>	Green snail		x
	<i>Theba pisana</i>	White garden snail		x
<b>BIVALVES</b>				
	<i>Crassostrea gigas</i>	Pacific oyster	x	
	<i>Musculista senhousia</i>	Japanese mussel	x	
	<i>Mytilus galloprovincialis</i>	Blue mussel	x	
<b>FISH</b>				
	<i>Acanthogobius flavimanus</i>	Yellowfin goby	x	
	<i>Gambusia affinis</i>	Mosquitofish		x
<b>AMPHIBIAN</b>				
	<i>Xenopus laevis</i>	African clawed frog		x

## SD(TR) Marine NIS

Species	Notes			
<b>PLANTS</b>				
<i>Avicennia marina</i>				
<i>Tamarix spp.</i>				
<b>ALGAE</b>				
<i>Caulerpa taxifolia</i>				
<i>Lomentaria hakodatensis</i>				
<i>Sargassum muticum</i>				
<b>CILIATES</b>				
<i>Lobochona prorates</i>				
<b>ANENOMES</b>				
<i>Bunodeopsis sp.</i>				
<i>Diadumene franciscana</i>				
<i>Diadumene lineata</i>				
<b>HYDROZOAN</b>				
<i>Tubularia (AKA Ectopleura) crocea</i>				
<b>BRYOZOAN</b>				
<i>Bowerbankia gracilis ?</i>				
<i>Bugula "neritina"</i>				
<i>Cryptosula pallasiana</i>				
<i>Victorella pavida</i>	Added by this study			
<i>Watersipora "subtorquata"</i>				
<i>Watersipora arcuata</i>				
<i>Zoobotryon verticillatum</i>				
<b>OLIGOCHAETES</b>				
<i>Tubificoides brownea</i>				
<b>POLYCHAETES</b>				
<i>Amblyosyllis speciosa</i>				
<i>Demonax sp.</i>				
<i>Hydroides dirampa</i>				
<i>Hydroides elegans</i>				
<i>Lycatopsis pontica</i>				
<i>Myrianida pachycera</i>				
<i>Neanthes acuminata (= caudata)</i>				
<i>Nicolea sp. A</i>				
<i>Pseudopolydora paucibranchiata</i>				
<i>Streblospio benedicti</i>				
<b>COPEPODS</b>				
<i>Pseudodiaptomus marinus</i>				
<b>AMPHIPODS</b>				
<i>Aoroides secunda</i>				
<i>Corophium acherusicum</i>				
<i>Corophium heteroceratum</i>				
<i>Corophium insidiosum</i>				
<i>Corophium uenoi</i>				
<i>Elasmopus rapax</i>				
<i>Erichthonius brasiliensis</i>				
<i>Grandidierella japonica</i>				
<i>Jassa marmorata (= falcata)</i>				
<i>Leucothoe alata</i>				
<i>Liljeborgia sp.</i>				
<i>Stenothoe valida</i>				
<b>TANAIDS</b>				
<i>Sinelobus? stanfordi</i>				
<b>OSTRACOD</b>				

## SD(TR) Marine NIS

	<i>Aspidoconcha limnoriae</i>				
	<i>Redekea californica</i>				
ISOPODS					
	<i>Iais californica</i>				
	<i>Limnoria tripunctata</i>				
	<i>Limnoria quadripunctata</i>				
	<i>Paranthura japonica</i>				
	<i>Sphaeroma quoyanum</i>				
	<i>Sphaeroma walkeri</i>				
BARNACLES					
	<i>Balanus amphitrite</i>				
	<i>Balanus improvisus</i>	Added by this study			
	<i>Balanus reticulatus</i>	Added by this study			
SHRIMP					
	<i>Palaemon macrodactylus</i>				
GASTROPODS					
	<i>Acloidella takanosimensis</i>	may not be established			
	<i>Babakina festiva</i>				
	<i>Catrina rickettsi</i>				
	<i>Philine auriformis</i>				
BIVALVES					
	<i>Crassostrea gigas</i>				
	<i>Lyrodus pedicellatus</i>				
	<i>Mercenaria mercenaria</i>	may not be established			
	<i>Musculista senhousia</i>				
	<i>Mytilus galloprovincialis</i>				
	<i>Teredo navalis</i>				
	<i>Theora fragilis (= lubrica)</i>				
TUNICATES					
	<i>Ascidia sp.</i>				
	<i>Ascidia zara</i>				
	<i>Bostrichobranchus pilularis</i>				
	<i>Botrylloides perspicuum</i>	Added by this study; ID needs verification			
	<i>Botrylloides violaceus</i>				
	<i>Botryllus firmus</i>				
	<i>Botryllus schlosseri</i>				
	<i>Botryllus sp. A</i>				
	<i>Ciona intestinalis</i>				
	<i>Ciona savigny</i>				
	<i>Diplosoma listerianum</i>	Added by this study; ID needs verification			
	<i>Microcosmus squamiger</i>				
	<i>Mogula sp. A</i>	Added by this study; ID needs verification			
	<i>Polyandrocarpa zorritensis</i>				
	<i>Styela canopus</i>				
	<i>Styela clava</i>				
	<i>Styela plicata</i>				
	<i>Symplegma brakenhelmi</i>				
	<i>Symplegma reptans</i>				
FISH					
	<i>Acanthogobius flavimanus</i> (yellowfin goby)				
	<i>Poecilia latipinna</i> (sailfin molly)				
	<i>Tridentiger trigonocephalus</i> (chameleon goby)				

**Appendix F. NIS work at US West Coast National Estuarine Research Reserves and National Marine Sanctuaries**

<b>Timeline</b>	<b>Lead local researcher(s)</b>	<b>Project type</b>	<b>Project title/description</b>	<b>NIS studied</b>	<b>Links</b>
<b>Elkhorn Slough NERR</b>					
Ongoing	Kerstin Wasson, ESNERR RC	Regional Monitoring & Management	Early detection program (discover new invasions of least wanted species and intervene)	Aquatic nuisance species	
Ongoing	Kerstin Wasson, ESNERR RC	Broadscale Monitoring	Crab monitoring (detects non-native green crab, new invasions)	<i>Carcinus maenas</i>	
Ongoing	Kerstin Wasson, ESNERR RC	Broadscale Monitoring	Recruitment monitoring (new pilot examining settlement of natives/non-natives).	marine invertebrates	
Present	Kerstin Wasson, ESNERR RC	Research & Monitoring	Ecotone monitoring, transplant, and restoration experiments (effect of native vs. invasive upland plants on adjacent marsh community)		
Present	Kerstin Wasson, ESNERR RC	Research	Characterization of invertebrate invaders of ESNERR (##, transport mechanisms, notorious characters)		
Present	Kerstin Wasson, ESNERR RC	Research	Examination of habitat bias in invertebrate invasions (hard substrates more invaded than soft; estuaries more invaded than open coast)	Marine invertebrates of the fouling community	
Present	Rikke Kvist Preisler, UC Santa Cruz	Research	Green crab behavior and impacts	<i>Carcinus maenas</i>	
Present	Kimberly Heiman, RGF (Stanford)	Research	Community effects of invasive reef-building worm	<i>Ficopomatus enigmatus</i>	<a href="http://www.elkhornslough.org/research/grf_kimberly.htm">www.elkhornslough.org/research/grf_kimberly.htm</a>
Past	Jeb Byers, former RGF	Research	A mechanistic understanding of species invasion: Toward a predictive science of introduced species' effects on estuarine ecosystems (Invasive snail outcompetes native)	<i>Batillaria attramentaria</i>	<a href="http://www.elkhornslough.org/research/grf_jeb.html">www.elkhornslough.org/research/grf_jeb.html</a>
Past	Kerstin Wasson, ESNERR RC	Workshop	National invasion monitoring workshop and summary		
<b>Kachemak Bay NERR</b>					
Ongoing	W. Scott Pegau KBNERR RC	Monitoring (regional)	Community detection of non-indigenous crabs. School groups are to be trained in how to trap and identify crabs to monitor for non-indigenous species.	<i>Carcinus maenas</i> , others	
Past (2000)	Tuck Hines, Greg Ruiz, SERC	Research	Marine invasive species and biodiversity of South Central Alaska	Fouling community	<a href="http://www.pwsrcc.org/NIS/pws.html#marine">http://www.pwsrcc.org/NIS/pws.html#marine</a>

### Monterey Bay NMS

Present	Steve Lonhart, Sanctuary Integrated Monitoring Network Coordinator	Local Monitoring & Management	Monitoring and management of <i>Undaria</i> to determine whether manual removal effectively reduces the harbor population; mapping to measure rate of spread and identify areas susceptible to future invasion.	<i>Undaria pinnatifida</i> (alga)	<a href="http://www.mbnms-simon.org/sections/rockyShores/project_info.php?pid=100184&amp;sec=rs">http://www.mbnms-simon.org/sections/rockyShores/project_info.php?pid=100184&amp;sec=rs</a>
Present	Lonhart, collaborating with Moss Landing Marine Lab	Regional Monitoring	Survey for NIS along the open coast		
Past		Compilation	NIS list for Monterey Bay NMS		<a href="http://www.mbnms.nos.noaa.gov/sitechar/spex.html">http://www.mbnms.nos.noaa.gov/sitechar/spex.html</a>

### Olympic Coast NMS

Ongoing	Mary Sue Brancato, Resource Protection Specialist	Broadscale Monitoring	Crab monitoring (monthly monitoring in the lower intertidal zone to detect new invasions of non-native crabs)	To detect <i>Carcinus maenas</i> , others	
Present	Mary Sue Brancato, Resource Protection Specialist	Local Monitoring/ Baseline Survey	Rapid assessment of intertidal organisms at coastal sites throughout sanctuary		

### Padilla Bay NERR

Ongoing	Sharon Riggs,	Broadscale Monitoring	Monitoring for invasive crabs in seagrass and rip-rap habitats (detects new invasions of nearshore non-native crabs, provides information on native crab community)	To detect <i>Carcinus maenas</i> , others	
Ongoing		Management & Monitoring	<i>Spartina</i> eradication	<i>Spartina alterniflora</i>	
Current	Jamey Selleck, Western Washington U	Research	Spawning and recruitment events of the invasive, purple varnish clam	<i>Nuttallia obscurata</i>	
Past	C. Eric Hellquist, former GRF, U Washington	Research	Predicting the invasion potential and consequences of the non-indigenous cordgrass, <i>Spartina anglica</i> , within Padilla Bay, Washington	<i>Spartina anglica</i>	
Past	Dan Hahn, former GRF, U Washington	Research	Competition between, and biodiversity associated with, an introduced seagrass, <i>Zostera japonica</i> , and its native congener,	<i>Zostera japonica</i>	



Past	Marjorie Wonham, former GRF, U Washington	Research	<i>Zostera marina</i> Why are estuarine communities more invaded? An experimental test with the invasive mussel, <i>Mytilus galloprovincialis</i>	<i>Mytilus galloprovincialis</i>	
Past	Chris Harley, U Washington	Research	Positive effects of a dominant invader on introduced and native mudflat species	<i>Batillaria attramentaria</i>	

### South Slough NERR

Present	Lisa Turnbull, GRF, U Oregon	Research	The effects of the invasive grasses <i>Phalaris arundinacea</i> and <i>Zostera japonica</i> on ecosystem processes in the South Slough Reserve	<i>Phalaris arundinacea</i> , <i>Zostera japonica</i>	
Present	Kerri Kidder GRF, U Oregon	Research	A biological vector for invasive species: Drifting path, species associations, and recruitment of <i>Nereocystis luetkeana</i>		

### Tijuana River NERR

Ongoing	Drew Talley, SFB NERR	Management, Research	Invasive plant program: Tamarisk research and removal	<i>Tamarix spp</i>	
Ongoing	Christine Whitcraft, Scripps Institution of Oceanography	Research	Effects of tamarisk on salt marsh soils and infauna	<i>Tamarisk spp.</i>	
Ongoing	Jeff Crooks, TR NERR	Management, Research	Studies examining how research can facilitate management decisions	Plant invaders	
Ongoing	Jeff Crooks, TR NERR	Research	Invasion of terrestrial snails into salt marshes	<i>Theba pisana</i> , <i>Helix aperta</i>	
Ongoing	Jeff Crooks, TR NERR	Research	Distribution of <i>Crassostrea gigas</i> in San Diego County	<i>Crassostrea gigas</i>	
Present	Sean Menke, GRF, UC San Diego	Research	Role of abiotic factors in determining invasion success of Argentine ants, <i>Linepithema humile</i>	<i>Linepithema humile</i>	
Past	Edward Woch, GRF, San Diego State University	Research	Dispersion patterns and associations of invasive exotic plants within the Tijuana River Watershed	<i>Tamarix spp.</i>	
Past	John Callaway, University of San Francisco	Research	Effects of freshwater inflows on invasive grasses in the high marsh	<i>Polypogon monspeliensis</i>	
Past	Meghan Fellows, San Diego State University	Research	Interactions between exotic sicklegrass and endangered native plants	<i>Parapholis incurva</i>	

## Appendix OC-A. Survey and Taxonomy Participants

<b>Participant</b>	<b>Expertise</b>	<b>Dates of Field Participation</b>
Jessica Anchor	Field Expeditor	8/6/02-8/8/02
Liam Antrim	Generalist	8/7/02
Bill Austin	Sponges	Laboratory identifications
Helen Berry	Generalist	8/20/01-8/23/01
Brian Bingham	Generalist	8/6/02-8/11/02
Barbara Blackie	Field Expeditor	8/20/01-8/21/01
Ed Bowlby	Generalist	8/18/01-8/20/01
Mary Sue Brancato	Generalist, Project Manager	8/18/01-8/23/01, 6/27/02, 8/6/02-8/12/02
Katie Brenkman	Field Expeditor	8/21/01-8/23/01, 8/6/02-8/12/02
Betty Bookheim	Algae, Generalist	8/18/01-8/19/01, 8/6/02-8/8/02
John Chapman	Crustaceans	8/18/01-8/23/01, 7/23/02, 8/7/02-8/10/02; Laboratory identifications
Jeff Cordell	Copepods	Laboratory identifications
Allen Fukuyama	Molluscs, Generalist	8/18/01-8/20/01, 8/6/02-8/12/02
Jeff Goddard	Bryozoans, Nudibranchs, Hydroids, Generalist	8/18/01-8/23/01, 8/6/02-8/12/02
Leslie Harris	Polychaetes	8/18/01-8/23/01, 8/6/02-8/12/02; Laboratory identifications
Kristin Hemmelgarn	Field Expeditor, Generalist	8/6/02-8/12/02
Gordon Hender	Echinoderms	Laboratory identifications
Yayoi Hirano	Stauromedusae	Laboratory identifications
Valerie Hironaka	Generalist	8/10/02
Greg Jensen	Decapods, Shrimps	Laboratory identifications
Howard Jones	Generalist	8/21/02
David Kirner	Field Expeditor	8/18/01-8/23/01, 6/27/02
Alan Kohn	Gastropods, Generalist	Laboratory identifications
Gretchen Lambert	Ascidians	Laboratory identifications
Alberto Lindner	Hydroids	Laboratory identifications
John Ljubenkov	Flatworms, Nemerteans, Anemones, Bivalves, Misc.	Laboratory identifications
Mary McGann	Foraminiforas	Laboratory identifications
Kathy Ann Miller	Algae	8/18/01-8/23/01; Laboratory identifications
Claudia Mills	Hydromedusae, Ctenophores	8/18/01-8/20/01, 6/27/02
Ben Miner	Generalist	8/6/02-8/10/02
Jon Norenburg	Nemerteans	Laboratory identifications
Bruno Pernet	Polychaetes, Generalist	8/6/02-8/10/02
Paul Scott	Molluscs, Gastropods	8/18/01-8/23/01
David Secord	Anemones, Generalist	8/18/01-8/23/01
Amy Sewell	Field Expeditor	8/18/01-8/19/01
Craig Staube	Pericarid Amphipods	Laboratory identifications
Jason Whitaker	Field Expeditor	8/18/01-8/23/01
Melissa Wilson	Algae	8/6/02-8/12/02
Judith Winston	Bryozoans	Laboratory identifications
Marjorie Wonham	Generalist	8/18/01-8/20/01
Sandy Wylee-Eschuveria	Seagrasses	Laboratory identifications

**Appendix B. Nearshore Survey Sites Sampled 27 June 2002 (North to South)**

<b>Site Code</b>	<b>Site Name</b>	<b>Latitude</b>	<b>Longitude</b>
NBMN	Neah Bay - Marina Entrance Nearshore	48.36961667	-124.61495
NBWN	Neah Bay West Nearshore	48.3749	-124.6193333
WBN	Warmhouse Beach Nearshore	48.39136667	-124.665
TIN	Tatoosh Island Nearshore	48.39396667	-124.7327
WPN	Waatch Point Nearshore	48.3353	-124.6865167
MBHN	Makah Bay - Hobuck South Nearshore	48.32873333	-124.6698167
MBSNN	Makah Bay - Sooes North Nearshore	48.30728333	-124.6728833
MBSSN	Makah Bay - Sooes South Nearshore	48.30031667	-124.6744
PHSN	Portage Head South Nearshore	48.2805	-124.6904333
CAN	Cape Alava Nearshore	48.17713333	-124.7446833
SPSN	Sand Point South Nearshore	48.11041667	-124.7090833
JRN	Jagged Rock Nearshore	47.99235	-124.6917333
PAN	Point of Arches Nearshore	48.25261667	-124.70505
HRNN	Hand Rock North Nearshore	48.05541667	-124.7
CJN	Cape Johnson Nearshore	47.97028333	-124.6833333
LPN	La Push Nearshore	47.8956	-124.6454