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# Monitoring Report for Harbor Operations

Vandenberg Air Force Base, California

October 2009



## Prepared for

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## Acronyms and Abbreviations

Fisheries	National Marine Fisheries Service
ft	feet
IHA	Incidental Harassment Authorization
MSRS	ManTech SRS Technologies, Inc.
NOAA	National Oceanic and Atmospheric Administration
PDT	Pacific Daylight Time
VAFB	Vandenberg Air Force Base

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## 1.0 Introduction and Background

Under the Marine Mammal Protection Act of 1972, the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (Fisheries) issued an Incidental Harassment Authorization (IHA) to United Launch Alliance for the harassment of small numbers of Pacific harbor seals (*Phoca vitulina richardsi*), California sea lions (*Zalophus californianus*), and northern elephant seals (*Mirounga angustirostris*) incidental to Delta Mariner operations, harbor maintenance dredging, and kelp mitigation taking place at the harbor on south Vandenberg Air Force Base (VAFB) from August 20, 2008 to August 19, 2009 (NOAA 2008); see Figure 1. A new IHA was issued for activities taking place September 4, 2009 to September 3, 2010 (NOAA 2009b).

### 1.1 Pacific Harbor Seals

Pacific harbor seals haul out on the remote sandy beaches and rocky ledges along the shore of VAFB. The main haul-out sites are on south VAFB near south Rocky Point (see Figure 2), with smaller groups found on north VAFB. The haul-out near the project area (Figure 2: Small Haul-out #1) is the southeastern most of the south base haul-out sites.

Based on baseline data from monthly counts conducted by ManTech SRS Technologies, Inc. (MSRS) from 2007 to 2009, a total of zero to 22 harbor seals are typically observed at Small Haul-out #1. Up to 25 harbor seals were observed using this haul-out site during dock construction monitoring conducted in June 2002 (SRS 2002). Use of this site by harbor seals as a haul-out is largely dependent on tide, with the site mostly to completely under water at tides above 2.0 feet (ft), preventing seals from hauling out at these times.

Dependent pups have not been observed at this site during monthly counts, but weaned pups have been documented sporadically as early as August. With pupping season on VAFB starting in late March to early April, most if not all pups, have been weaned by late June.

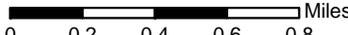
### 1.2 California Sea Lions

California sea lions have not been documented during 2007-2008 monthly counts conducted at VAFB haul-out sites, but have been documented hauled out sporadically at these and other coastal rocks and beaches during other monitoring activities (MSRS unpublished notes). Sea lions were observed hauled out in the harbor area during dock construction monitoring conducted in June 2002 (SRS 2002). In 2009, starting in June, sea lions have been observed regularly in the vicinity of South Rocky Point, with the birth of short-lived pups occurring in late June at North Rocky Point. Increased sea lion observations may be related to the predicted El Niño event for 2009 (NOAA 2009a). This would be consistent with observations of increased numbers of sea lions hauling out at VAFB during previous El Niño events (P. Thorson, MSRS, pers. comm.).



**Figure 1.  
Project Area  
Location**

 VAFB Boundary

 Miles  
0 0.2 0.4 0.6 0.8

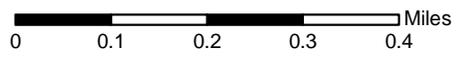
For Official Use Only.  
GIS data courtesy of 30th Space Wing Geo-Integration Office,  
Vandenberg Air Force Base, California.  
Biological data collected by ManTech SRS Technologies, Inc.  
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**Figure 2.  
South Base  
Haul-out Sites**

Pinniped Haul-out Sites



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## **2.0 Project Activities**

### **2.1 Harbor Dredging**

Activities including staging of equipment for activities related to the dredging of the harbor were initiated in the first week of July 2009. Marine mammal monitors were present during the course of all activities with potential to flush pinnipeds when tides were at 2.0 ft or below (at tides above 2.0 ft the haul-out areas associated with offshore rocks are submerged). Monitoring was also conducted during tides in excess of 2.0 ft when pinnipeds were hauled out above the 2.0 ft tide line and project activities had the potential to result in disturbance.

Activities associated with dredging and harbor maintenance operations took place Monday through Friday from 0700 to 1700 hours Pacific Daylight Time (PDT). Activities for the period of July 2 – July 7 were restricted to staging equipment; active dredging started on July 8. Initial dredging was accomplished using a crane with a clam shell scoop parked at the end of the boat dock. Upon completion of dredging in areas within reach of the crane, a floating barge with excavator was employed to accomplish the remainder of the dredging. Dredging was completed by August 1 with the remainder of activities restricted to demobilization and painting of the gabions; the last of the demobilization activities requiring monitoring occurred on August 7.

### **2.2 Delta Mariner Operations**

Activities associated with the arrival of the Delta Mariner started on September 17. Hours of activity were irregular and dictated in part by tide and weather conditions. Most activities associated with the Delta Mariner took place when tides were above 2.0 ft as high tides were necessary for the vessel to enter the harbor. Marine mammal monitors were present during the course of all activities with potential to flush pinnipeds when tides were at 2.0 ft or below. On September 17 equipment staging coincided with low tides; thus, monitoring was conducted. Monitoring was also conducted during the cargo transport periods on September 20 and 21.

## **3.0 Monitoring Methods**

In addition to pinniped counts, which included species, number of animals, age class, and gender when possible, data on natural or human-caused disturbances, as well as any unusual pinniped behavior, was recorded. California brown pelicans perching on the breakwater and haul-out rocks and southern sea otters rafting in kelp patties east of the harbor were counted opportunistically throughout the course of each monitoring period (see Figure 3).

Pinniped counts were taken hourly or whenever a change in numbers occurred. In cases where animals entered the water or alerted, monitors noted the stimulus causing animals to leave the site or alert when it was identifiable. Counts were made using



**Figure 3. Project Area**

 Gabion	 Beach	 Kelp Mitigation Area
 Breakwater	 Large Haul-out Rock	 Kelp Patties

0 75 150 225 300 Yards

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GIS data courtesy of 30th Space Wing Geo-Integration Office,  
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10x42 power binoculars. Wind and temperature data were recorded hourly using a Kestrel 3000 hand-held wind gauge with a built-in thermometer.

Tide data, as presented in this report, was obtained from a tidal prediction program, JTides 5.2 using the Port San Luis site. An 8 minute backward correction was applied to Port San Luis tide times to account for the difference in locations.

Monitoring was conducted during all periods when tides of 2.0 ft or lower occurred during work hours. Monitoring was also conducted during tides in excess of 2.0 ft when pinnipeds were hauled out above the 2.0 ft tide line and project activities had the potential to result in disturbance. Night vision goggles were used for pre-dawn Delta Mariner operations on September 21.

## 4.0 Monitoring Results

Results of monitoring are summarized below. For a complete record of all observations made during monitoring activities, see Appendix A.

During project activities Pacific harbor seals hauled out were more responsive to visual disturbances than to auditory disturbances. No reaction was observed during equipment start-up, but movement of equipment (especially the crane or excavator arms) caused animals to alert and/or flush when the movement was visible from their haul-out area.

Table 1: Summary of pinniped reactions to project related disturbances

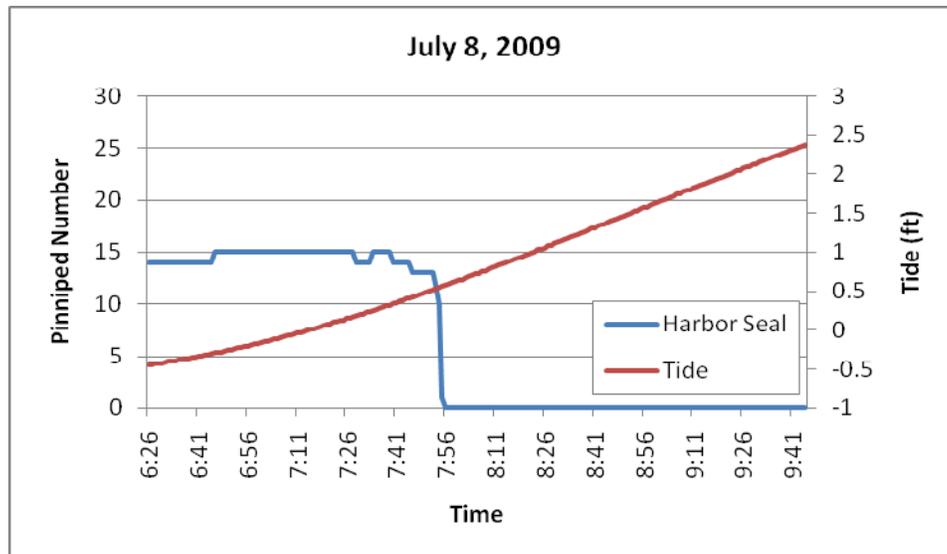
Date	Time	Number Hauled Out	Disturbance	Head Alert	Entered Water
7/08/09	07:54	10	Crane arm raised to vertical	0	10
7/09/09	08:06	2	Crane arm movement	0	2
7/10/09	07:22	8	Crane arm movement	7	1
	07:25	8	Crane arm movement	5	0
	07:26	8	Crane arm movement	3	5
	07:31	3	Crane dredges up long segment of flexible pipe	0	3
7/20/09	08:58	1*	Loader engine start and loader movement	1*	0
7/22/09	07:23	23	Wheel barrow accidentally knocked out of excavator bucket flushes 91 pelicans which fly towards seals	12	11
7/24/09	07:16	24	Excavator arm moved	0	24
7/27/09	09:11	2*	Two individuals walk out on breakwater to check kelp mitigation area	0	1*

\* = California sea lion (all other pinnipeds noted are Pacific harbor seals)

One incident of a California sea lion alerting to engine noise was observed. However, the sea lion that alerted was hauled out at the junction of the breakwater and dock (approximately 90 ft from equipment), placing it much closer to equipment than the harbor seals, which hauled out at least 183 ft from the dock. This animal appeared sick, making frequent irregular head movements, and briefly raised its head and opened its eyes in response to the noise before resettling.

#### 4.1 Pinnipeds

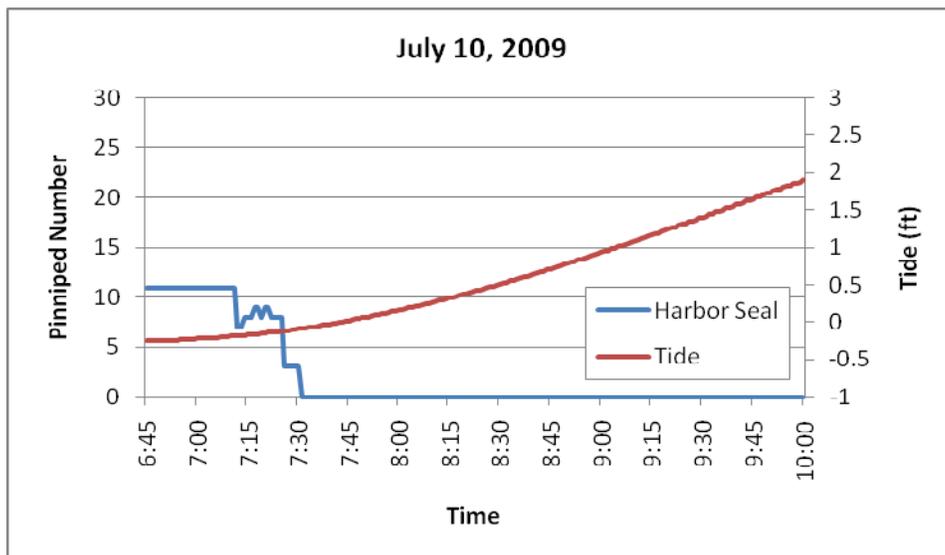
The number of harbor seals present on any given day appeared to be largely dependent on tide, although other factors such as weather and swell height likely affected numbers as well. During six of the monitoring periods tides did not drop below 1.0 ft; on these days no harbor seals were observed. On July 6, the tide dropped below 1.0 ft and seals were also not observed. Swells reaching an estimated 8 ft in height and winds in excess of 20 miles per hour were likely factors in the absence of harbor seals during that monitoring period. The graphs that follow depict the number of pinnipeds hauled out in relation to tide for all monitoring periods during which pinnipeds hauled out.



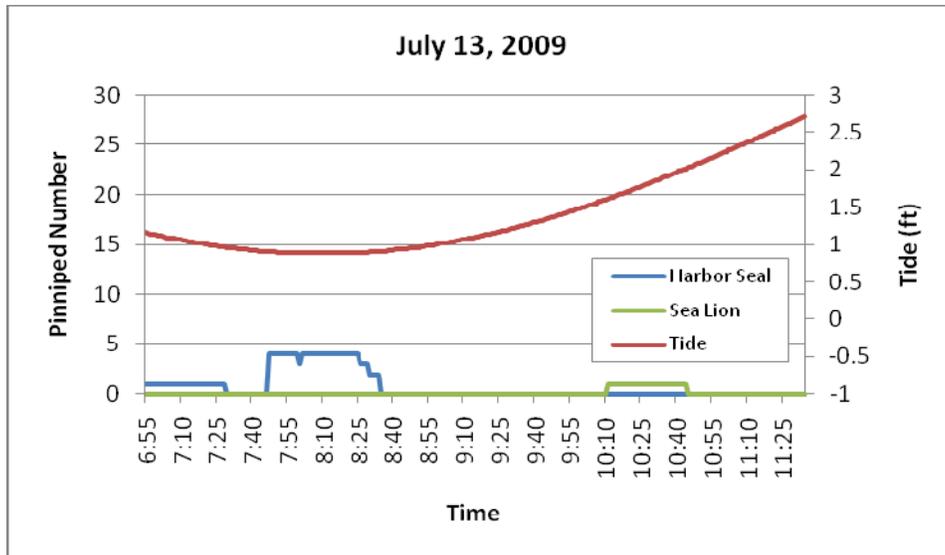
NOTE: Equipment started at 0742, 10 seals flushed due to crane movement at 0754.



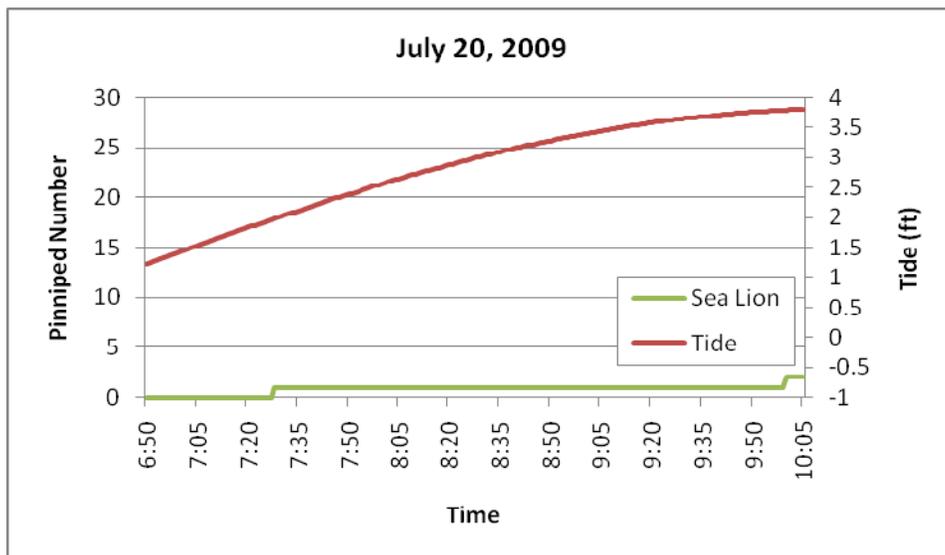
NOTE: Equipment started at 0755, two seals flushed due to crane movement at 0805.



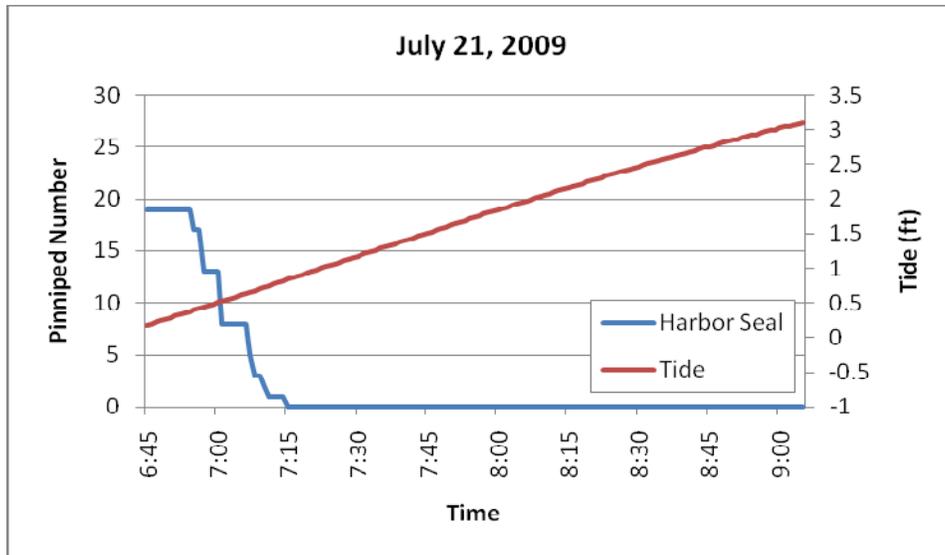
NOTE: Equipment started at 0718, one seal flushed due to crane movement at 0722, five flushed at 0726 and three flushed at 0731.



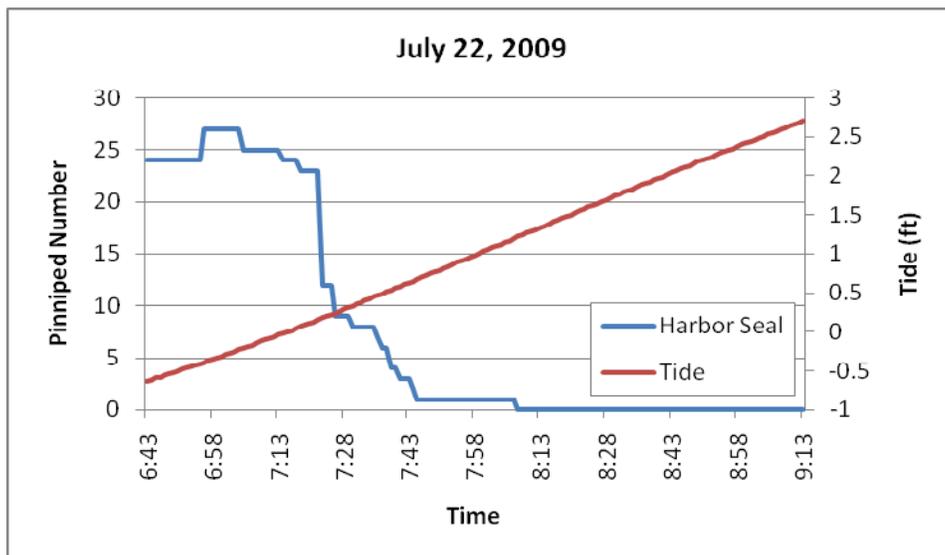
NOTE: Equipment started at 0900.



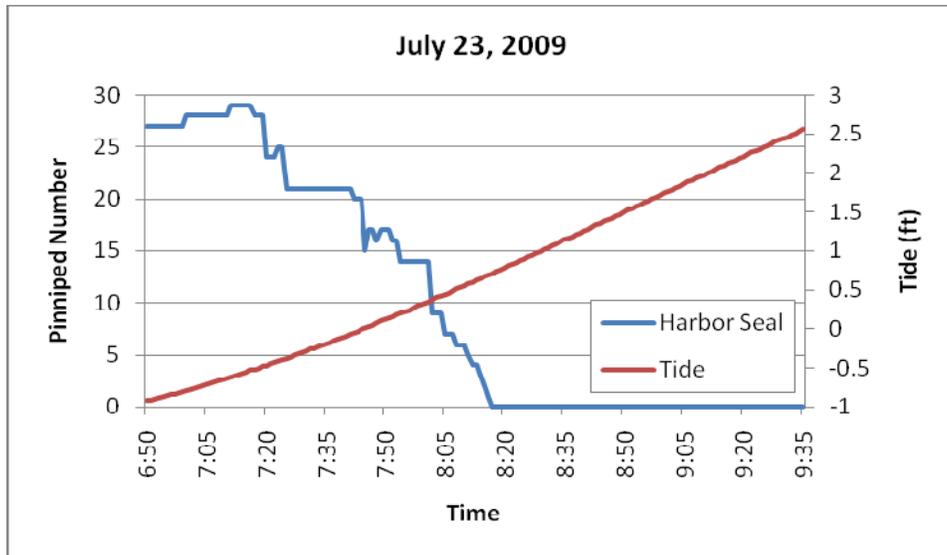
NOTE: Equipment started at 0702, sea lions were not in view of operations occurring on the dock after 1000 and were still on site when the area was re-checked at 1515.



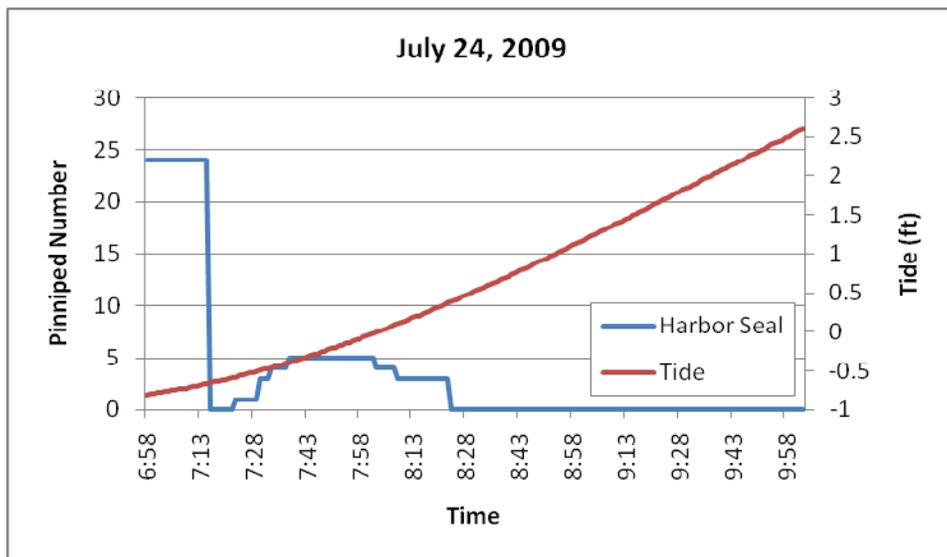
NOTE: Equipment started at 0711, but does not start moving until 0730.



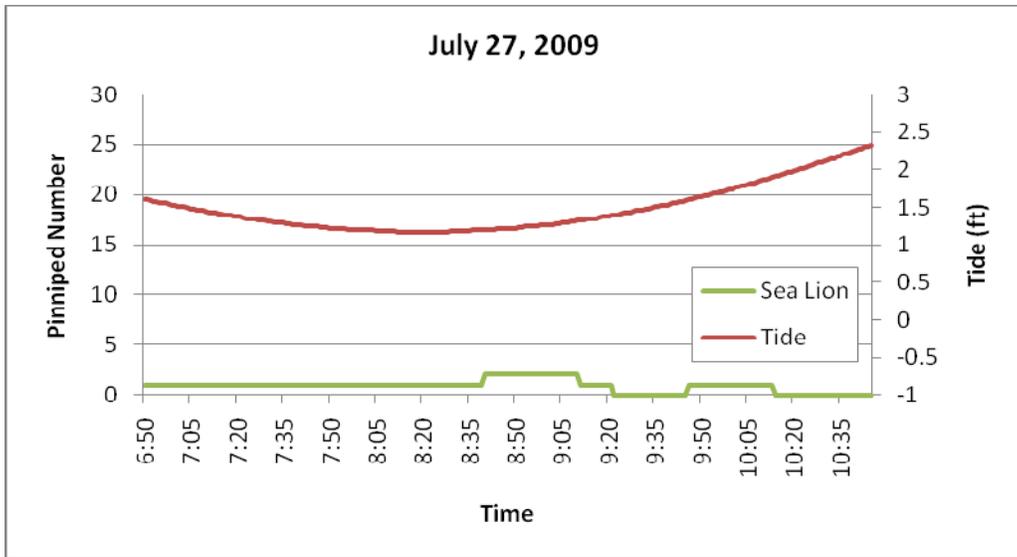
NOTE: Equipment started at 0710, 11 seals flushed due to birds flushed by falling wheel barrow at 0723.



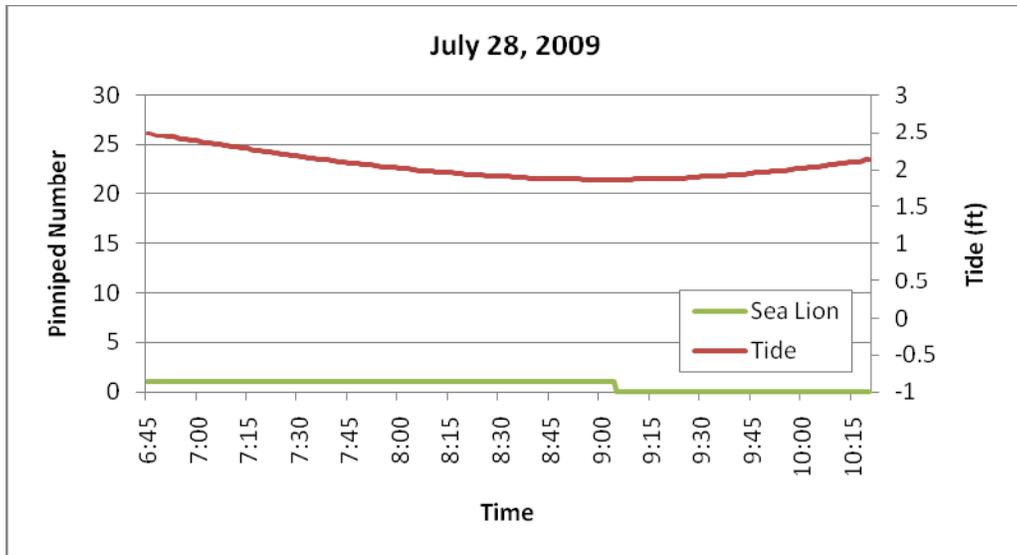
NOTE: Equipment started at 0709.



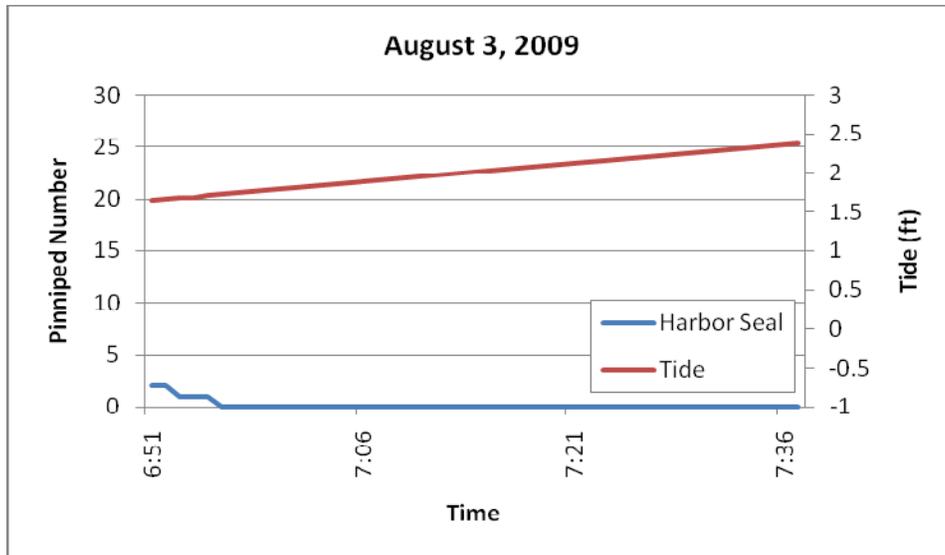
NOTE: Equipment started at 0716, all 24 seals flushed due to excavator movement at 0716.



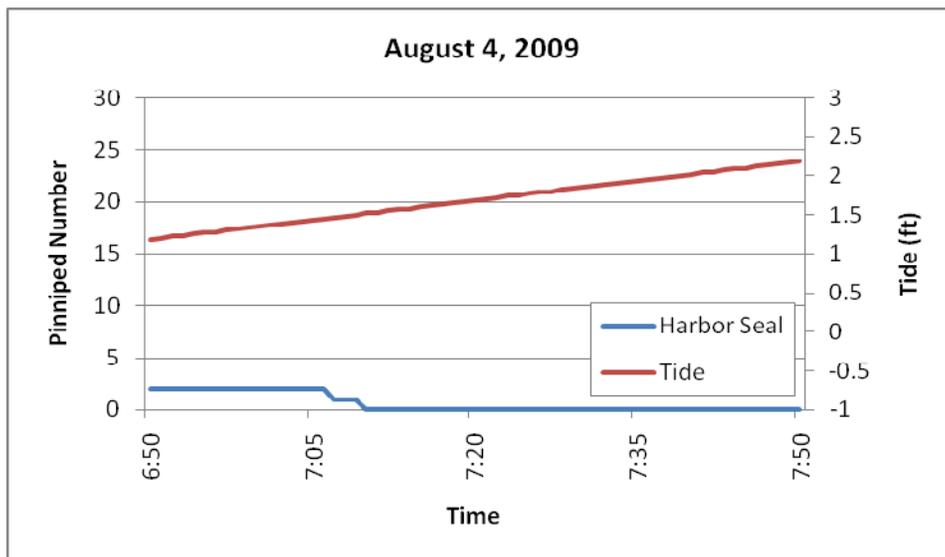
NOTE: Equipment started at 0726, one sea lion flushed by individuals traversing the breakwater at 0911.



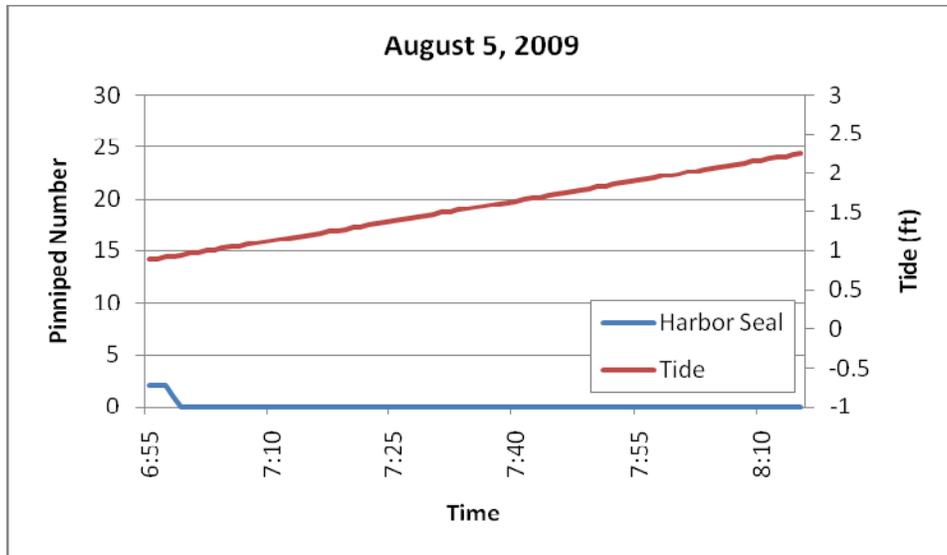
NOTE: Equipment started at 0707.



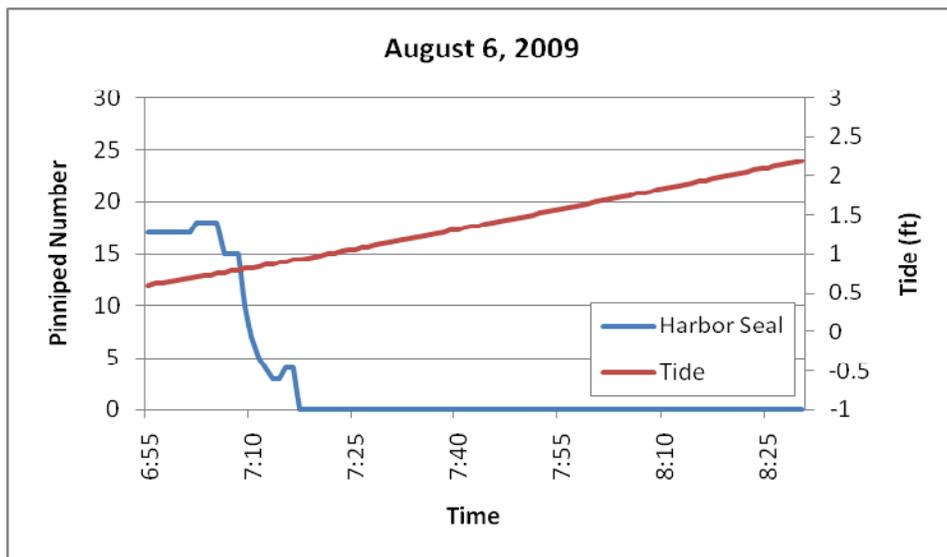
NOTE: Equipment started at 0706.



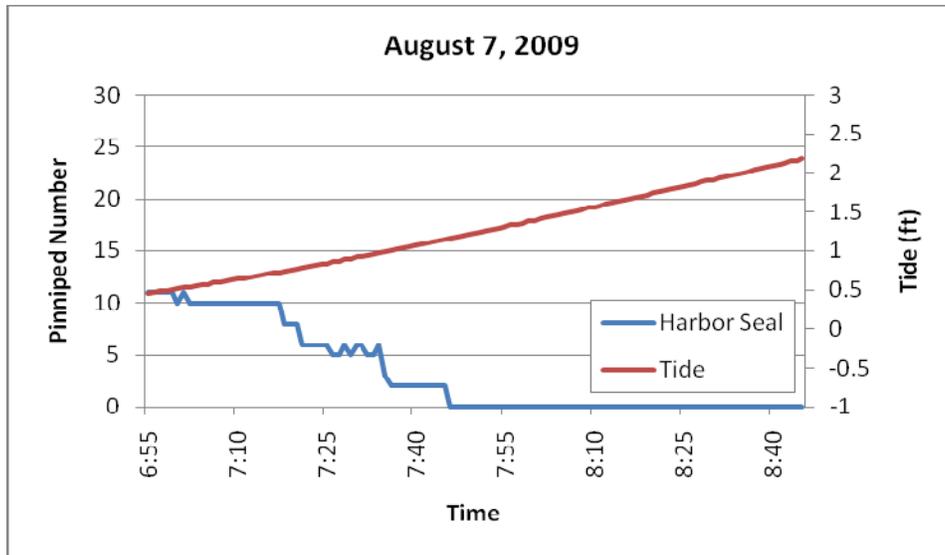
NOTE: No heavy equipment running during monitoring period.



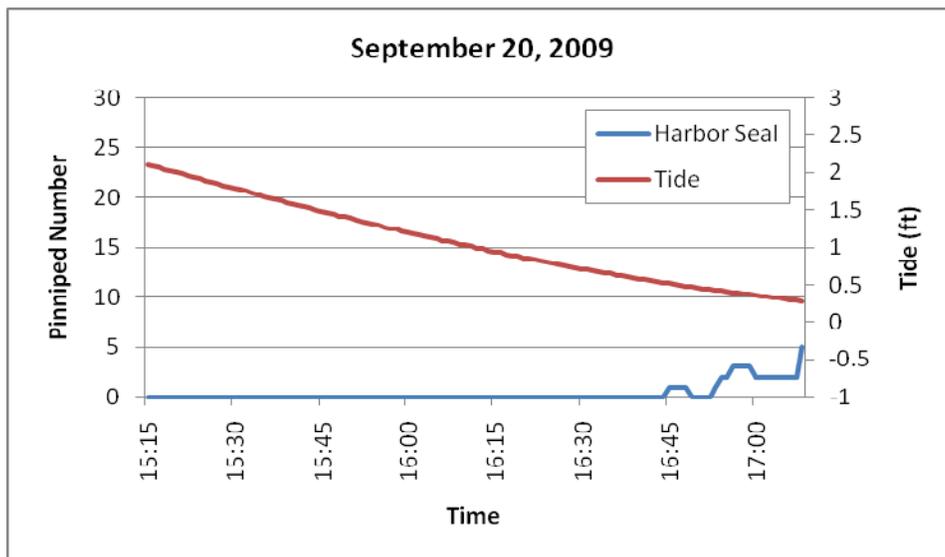
NOTE: Equipment started at 0718.



NOTE: Equipment started at 0713.



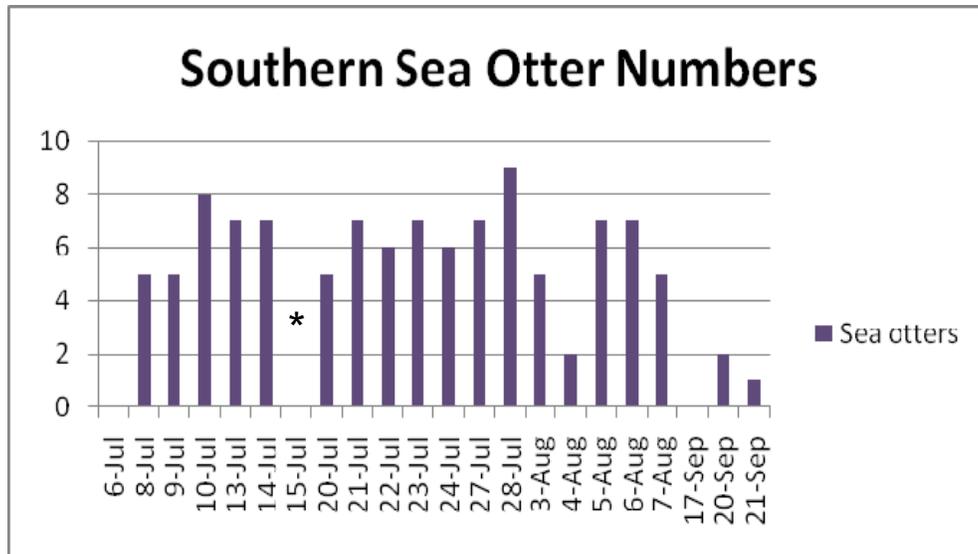
NOTE: Equipment started at 0730.



NOTE: Transport of container out of the dock area was completed by 1515; no heavy equipment was operating during monitoring period.

## 4.2 Southern Sea Otters

In addition to pinnipeds, southern sea otters were regularly observed rafting in the kelp patties east of the harbor. Between zero and nine sea otters were regularly observed in this location for the duration of project activities. No sea otter behavioral responses were observed due to activities occurring on the dock or in the harbor.



### NOTES:

Maximum number of southern seas otters observed per monitoring period.

\* Kelp beds east of the harbor were not visible during the monitoring period on July 15 due to dense fog.

## 5.0 Discussion

During the July 6 to August 7 monitoring period for activities associated with harbor dredging and maintenance, both Pacific harbor seals and California sea lions hauled out within view of the harbor and dock, where project activities were conducted. Harbor seals were only observed to utilize rocks approximately 540 to 570 ft south of the harbor area (Figures 3 and 4), while sea lions were observed hauled out both on the breakwater and on the beach southwest of the dock area.

Harbor seals usually began leaving their haul-out area when tides exceeded 0.0 ft, which is when waves typically began over washing the small haul-out rocks where the bulk of the seals congregated; all seals were usually gone by the time tides reached 1.0 ft. When tides reached 2.0 ft, all haul-out sites were submerged (Figure 5). Harbor

seals did not haul-out unless tides receded to low enough levels to expose the small haul-out rocks. Sea lions opted for haul-out locations (breakwater and strip of beach southwest of dock) that were not as affected by tide level.

All harbor seals observed appeared to be in good health. Several of the sea lions observed, however, exhibited symptoms of neurological impairment (abnormal movements and behaviors) and traumatic injury; these ailments were not associated with dredging activities.

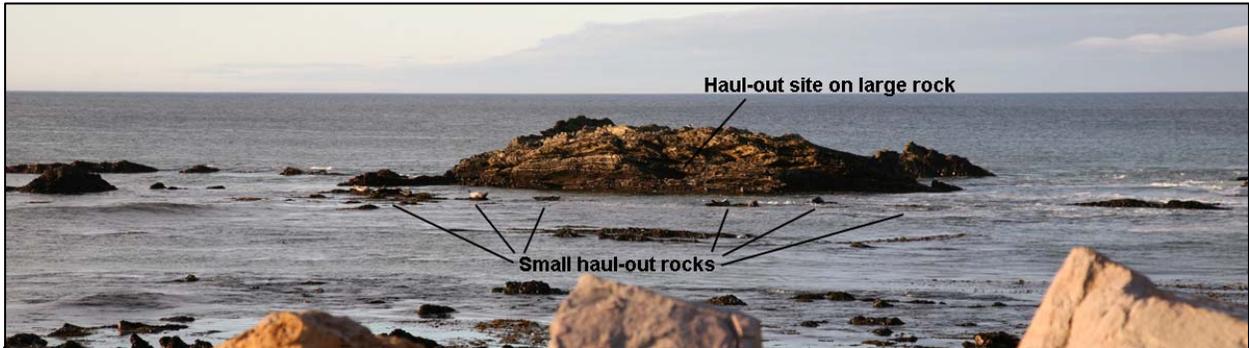


Figure 4. Rocks comprising Small Haul-out #1

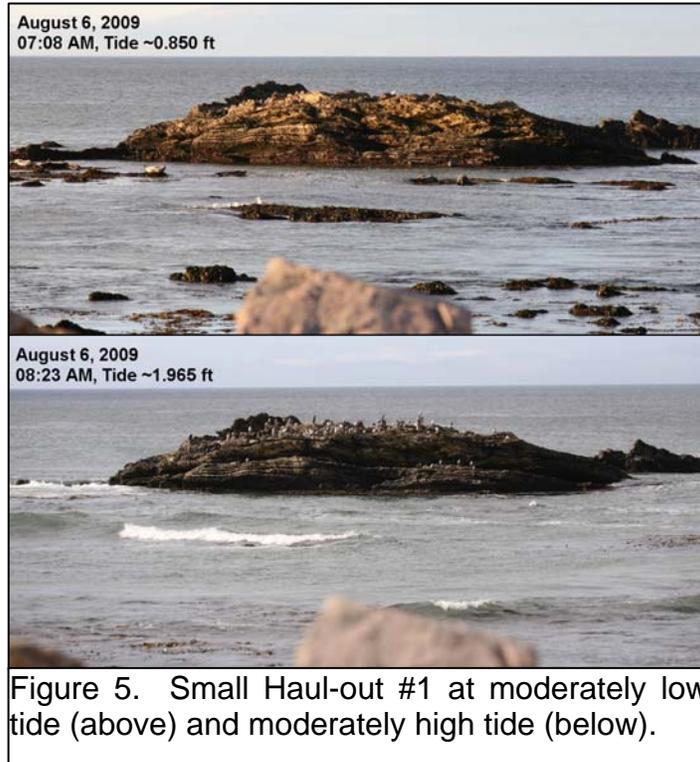


Figure 5. Small Haul-out #1 at moderately low tide (above) and moderately high tide (below).

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There was no indication of altered behavior of Pacific harbor seals and California sea lions in the water due to activities occurring on the dock or barge. These pinnipeds were routinely observed in the water within and around the harbor for the duration of project activities.

During the September 17 to 21 monitoring period for activities associated with the cargo delivery from the Delta Mariner, the only observation of pinnipeds hauled out occurred on September 20. However, on this day heavy equipment operations had concluded by the time tides reached low enough levels (0.51 ft) for pinnipeds to begin hauling out.

Night vision goggles were used to improve visibility of the haul-out rocks during monitoring of predawn low tide operations conducted on September 21. Lights from the harbor provided too much interference to make the night vision goggles useful, but did provide adequate illumination of the haul-out rocks to make any pinnipeds there visible with binoculars or the naked eye if they had hauled out.

Southern sea otter numbers fluctuated throughout each monitoring period and between days. Sea otter numbers appeared to be dependent on both time of day and ocean conditions with the highest numbers typically observed later in the morning (after 0900) when seas were calm.

California brown pelican presence and activity appeared to have an effect on pinnipeds in the area. When pelicans flushed and pinnipeds were present, the flushing of the pelicans caused the pinnipeds to flush as well. For example, on July 22, when pelicans were flushed from the breakwater (by a wheelbarrow dropped on the dock) and harbor seals were present on the haul-out rocks, the bulk of the pelicans flew straight from the breakwater to the haul-out flushing the seals. Harbor seals were also observed to flush when, unconnected with project activities, pelicans made a direct approach to land on the haul-out or when pelicans perching on the low haul-out rocks flushed due to waves.

## **6.0 Literature Cited**

National Ocean and Atmospheric Administration. 2008. Incidental Harassment Authorization. Issued to the United Launch Alliance. Dated August 20, 2008. NOAA/National Marine Fisheries Service, Silver Spring, MD. 3pp.

National Ocean and Atmospheric Administration. 2009a. El Nino/Southern Oscillation Diagnostic Discussion. Climate Prediction Center National Centers for Environmental Protection, NOAA/National Weather Service, Camp Springs, MD. 5pp.

National Ocean and Atmospheric Administration. 2009b. Incidental Harassment Authorization. Issued to the United Launch Alliance. Dated September 4, 2009. NOAA/National Marine Fisheries Service, Silver Spring, MD. 3pp.

SRS Technologies. 2002. Marine Mammal Monitoring During Dock Modification Construction at Vandenberg Air Force Base, 25-28 June 2002. SRS Technologies, Lompoc, CA. 9 pp.

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## **Appendix A : Daily Monitoring Logs**



Harbor Monitoring on July 6, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
07:10	None	0	0	Very windy, high swells; no equipment running or crew on site	Unimpaired	59.2	12.6	22.3	0	5-8'
08:30	None	0	0	Very windy, high swells; no equipment running or crew on site	Unimpaired	62.9	14.5	22.8	0	5-8'

Note: Wind speeds are given in miles per hour

Harbor Monitoring on July 8, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:26	<i>Phoca vitulina</i>	14	0	No equipment running or crew on site; 4 sea lions swam by offshore heading north ~10yds beyond the haul-out site	Unimpaired	55.5	2.3	5.6	15	3'
06:54	<i>Phoca vitulina</i>	15	0							
06:57	<i>Phoca vitulina</i>	15	0	16 <sup>th</sup> seal observed in water at the base of the haul-out rocks	Unimpaired	56.5	1.7	2.4	15	3'
07:02	<i>Phoca vitulina</i>	15	0	1 seal swam by ~10yds beyond haul-out (headed north)						
07:15	<i>Phoca vitulina</i>	15	0	Large swells starting to hit haul-out						
07:27	<i>Phoca vitulina</i>	14	1	1 juvenile (young from 2008) hauled out and 1 adult entered water						
07:29	<i>Phoca vitulina</i>	14	0	Juvenile entered water						
07:34	<i>Phoca vitulina</i>	14	1	Juvenile hauled back out						
07:40	<i>Phoca vitulina</i>	14	0	Juvenile entered water; crew arriving onsite	Unimpaired	57.1	2.1	3.6	5	3'
07:42	<i>Phoca vitulina</i>	14	0	Crane engine started, no reaction from seals						
07:46	<i>Phoca vitulina</i>	13	0	Seal entered water due to rising tide; seals still non-reactive to equipment; rocks being regularly overwashed by waves: seals "taco-ing" in response						
07:48	<i>Phoca vitulina</i>	13	0	1 seal switched rocks						
07:53	<i>Phoca vitulina</i>	12	0	1 seal entered water due to rising tide						
07:54	<i>Phoca vitulina</i>	10	0	2 seals washed off rocks						
07:55	<i>Phoca vitulina</i>	1	0	Movement of crane arm to vertical position caused immediate flushing of all but 1 seal after brief alert; birds in area undisturbed						
07:56	<i>Phoca vitulina</i>	0	0	Remaining seal entered water	Unimpaired	68.4	0.7	1.4	5	3'
08:02	None	0	0	1 seal swam through between haul-out and shore, headed west						
08:07	None	0	0	Small skiff craned into harbor						
08:09	None	0	0	All haul-out sites being over washed by every wave; 1 pelican on breakwater						
08:12	None	0	0	Large crane deposits 2 <sup>nd</sup> boat in harbor, 2 pelicans on breakwater						
08:20	None	0	0	2 bottle nosed dolphins swam by haul-out headed east; 5 pelicans on breakwater	Unimpaired	60.9	1.5	2.4	5	2'
08:33	None	0	0	1 harbor seal swam through the harbor; 5 otters rafting in kelp outside harbor; 2 dolphin east of the kelp patties						
09:00	None	0	0	Crane arm with dredge attachment briefly lowered; 6 pelicans on breakwater	Unimpaired	63.4	1.3	2.1	2	2'
09:06	None	0	0	Harbor seal swam through haul-out area						
09:20	None	0	0	7 pelicans on breakwater						
09:30	None	0	0	10 pelicans on breakwater; 4 otters rafting in kelp outside harbor; left at 9:45	Unimpaired	65.8	1.5	1.0	2	2'

Harbor Monitoring on July 9, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:36	<i>Phoca vitulina</i>	16	0	5 otters rafting in far kelp patty east of harbor; all of the seals are on the small haul-out rocks	Unimpaired	54.1	3.6	8.0	5	3'
07:00	<i>Phoca vitulina</i>	16	0		Unimpaired	55.6	3.6	11.6	10	3'
07:09	<i>Phoca vitulina</i>	18	0							
07:12	<i>Phoca vitulina</i>	16	0	The 2 seals that hauled out at 7:09 re-entered the water (never settled)						
07:15	<i>Phoca vitulina</i>	14	0	2 seals entered the water, 2 additional seals making brief haul-out attempts on various rocks						
07:17	<i>Phoca vitulina</i>	16	0	17 <sup>th</sup> seal trying out various rocks (briefly hauling out then re-entering water)						
07:28	<i>Phoca vitulina</i>	16	0	17 <sup>th</sup> seal thrashing about in apparent attempts to get comfortable, causes other seals to alert before it re-enters the water	Unimpaired	57.2	3.0	9.1	5	3'
07:30	<i>Phoca vitulina</i>	17	0	Crew arriving						
07:55	<i>Phoca vitulina</i>	15	0	Tide starting to come in, 2 seals washed off rocks by large wave; crane engine starts	Unimpaired	58.0	5.7	10	5	3'
07:58	<i>Phoca vitulina</i>	14	0	Seal washed off rocks						
08:02	<i>Phoca vitulina</i>	12	0	1 seal washed off rocks, 1 flushed off in response to rising crane arm						
08:03	<i>Phoca vitulina</i>	9	0	3 seals washed off rocks						
08:04	<i>Phoca vitulina</i>	3	0	6 seals washed off rocks; remaining 3 seals appear more concerned about the large waves impacting them than movement from the crane						
08:06	<i>Phoca vitulina</i>	2	0	Unclear whether seal flushed in response to waves or due to crane movement; seals unable to stay above water on the low haul-outs they are occupying, remaining 2 continue to battle waves						
08:07	<i>Phoca vitulina</i>	0	0	Remaining seals flushed by a combination of crane arm movement and waves, alerted to crane then hit in the back by a wave						
08:10	None	0	0	Begin dredging with crane						
08:17	None	0	0	6 otters in kelp outside harbor	Unimpaired	62.6	3.8	5.6	5	3
08:30	None	0	0	6 pelicans on breakwater; 6 otters east of harbor in kelp and 1 harbor seal						
08:44	None	0	0	6 pelicans on breakwater; 5 otters east of harbor in kelp and 1 harbor seal						
09:00	None	0	0	7 pelicans on breakwater; 3 otters in kelp east of harbor						
09:14	None	0	0	42 pelican on breakwater						
09:24	None	0	0	Otters gone						
09:45	None	0	0	71 pelicans on breakwater						
09:47	None	0	0	71 pelicans on breakwater, 5 otters in kelp east of harbor						
09:50	None	0	0	71 pelicans on breakwater, 5 otters in kelp east of harbor; haul-outs submerged; left site at 10:00	Unimpaired	63.5	4.7	8.4	5	3

Harbor Monitoring on July 10, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:45	<i>Phoca vitulina</i>	11	0	12 pelicans on breakwater; 5 otters in kelp east of harbor; crew arrived at 6:55; whitecaps out at sea	Unimpaired	53.7	5.0	9.5	15	3'
07:00	<i>Phoca vitulina</i>	11	0		Unimpaired	58.2	1.8	5.5	15	3'
07:12	<i>Phoca vitulina</i>	7	0	3 seals on large haul-out rock and 1 on the lower rock flushed into water; remaining seals alert and resettle after ~1min (no discernable cause for flushing)						
07:14	<i>Phoca vitulina</i>	8	0	A 9 <sup>th</sup> seal attempted to haul out as well, but rebuffed by seal already on rock (shook front flipper at seal attempting to haul-out)						
07:17	<i>Phoca vitulina</i>	9	0	Crane engine starts, no reaction from seals						
07:19	<i>Phoca vitulina</i>	8	0	Seal that hauled out at &:17 re-entered water, never appeared able to get comfortable						
07:20	<i>Phoca vitulina</i>	9	0							
07:22	<i>Phoca vitulina</i>	8	0	Crane arm starts moving causing 1 seal to flush, all other seals alert						
07:23	<i>Phoca vitulina</i>	8	0	Seals relax, crane arm stationary						
07:25	<i>Phoca vitulina</i>	8	0	5 seals alert as crane arm starts moving again						
07:26	<i>Phoca vitulina</i>	3	0	5 seals flush due to crane movement as dredging attachment lowered into place and dredging begins						
07:30	<i>Phoca vitulina</i>	3	0	4 <sup>th</sup> seal partially hauled out, equipment honks horn, no reaction from seals						
07:31	<i>Phoca vitulina</i>	0	0	Dredge picks up a long length of dangling tubing ~3" in diameter, all seals flush into water; 10 pelicans on breakwater; 3 seals in kelp outside harbor	Unimpaired	60.8	1.0	1.4	1.5	3'
07:37	None	0	0	Brief haul-out attempt by seal, but alerts to crane as hauling out and returns to water						
07:44	None	0	0	Seal in water by haul-out, appears to watch dredging activity for ~1min before submerging	Unimpaired	63.1	0.6	0.8	10	3'
08:00	None	0	0	3 harbor seals still sleeping and 8 otters (3 likely missed during last count) in kelp patty east of harbor; 20 pelicans on breakwater; lower haul-out rocks being over washed by occasional large waves						
08:09	None	0	0	Seal approaches haul-out from east, watches activity for about a minute, then turns and heads back east						
08:16	None	0	0	Seal swims through haul-out site	Unimpaired	65.2	5.0	9.2	10	3'
08:28	None	0	0	Seal swims through haul-out site, lower rocks now being overwashed by every wave; 33 pelicans on breakwater; 5 otters swimming in kelp outside harbor; 3 harbor seals sleeping in kelp patty east of breakwater						
09:00	None	0	0	47 pelicans on breakwater; 3 harbor seals sleeping in kelp east of breakwater; 5 otters in far patty southeast of harbor	Unimpaired	65.6	2.1	6.4	5	3'
09:13	None	0	0	2 harbor seals swam through haul-out area; only haul-out site exposed is lower ledge of the large rock						
09:30	None	0	0	82 pelicans on breakwater; 2 otters in far kelp patty east of harbor	Unimpaired	62.0	0.9	3.5	5	3'
10:00	None	0	0	113 pelicans on breakwater; 2 otters in far kelp patty east of harbor; haul-out area on large rock submerged; left site at 10:00	Unimpaired	67.1	3.7	4.6	5	3'

Harbor Monitoring on July 13, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:55	<i>Phoca vitulina</i>	1	0	No equipment running, 4 otters in kelp outside/east of harbor, male sea lion floating in harbor, 13 pelicans on breakwater	Unimpaired	63.9	0	0	0	<1'
07:29	<i>Phoca vitulina</i>	0	0	Harbor seal flushed off rock when front loader started; male sea lion still present; 4 otters in kelp outside harbor	Unimpaired	64.9	0	0	0	<1'
07:47	<i>Phoca vitulina</i>	2	2	1 harbor seal in water, 1 of the harbor seals keeps hauling out on the small haul-out rocks which are partially submerged and then re-entering water, remaining adult and pups also on small haul-out rocks; pups keep getting knocked back into water by waves; no equipment running (crane isn't going to be used today)						
08:00	<i>Phoca vitulina</i>	1	2	One adult enters water for no apparent reason						
08:01	<i>Phoca vitulina</i>	2	2	Adult seal hauls back out						
08:26	<i>Phoca vitulina</i>	2	1	1 harbor seal pup enters water (no apparent reason); 7 otters in kelp outside harbor; 12 pelicans on breakwater; male sea lion still sleeping in harbor	Unimpaired	67.4	1.7	3.1	0	<1'
08:30	<i>Phoca vitulina</i>	2	0	Remaining harbor seal pup enters water (no apparent reason)						
08:35	<i>Phoca vitulina</i>	0	0	Both adult harbor seals enter water within a minute of each other; likely stimulated to enter water by advancing tide						
08:52	None	0	0	Male sea lion may be sick, has floated into dredging area within 40' of the dock and is showing little fear of human presence, no fresh wounds evident	Unimpaired	70.2	1.2	2.0	0	<1'
09:00	None	0	0	2 harbor seals sleeping in water, male sea lion still in harbor; crew will only be running front loader on dock; 20 pelicans on breakwater; 4 otters in kelp outside harbor						
10:00	None	0	0	No harbor seals evident; male sea lion still in dredge area; 60 pelicans on breakwater; 1 otter in kelp outside harbor	Unimpaired	71.5	1.6	2.0	0	<1'
10:19	<i>Zalophus californianus</i>	0	1	Juvenile sea lion enters harbor dredge area, noses male sea lion, swims around harbor and hauls out on the breakwater						
10:29	<i>Zalophus californianus</i>	0	1	Crew launches skiff, minimal reaction from the male sea lion (still in dredge area), juvenile still hauled out on breakwater						
10:45	<i>Zalophus californianus</i>	0	0	Juvenile sea lion enters water and leaves harbor; male sea lion still in dredge area, unaffected by skiff; 1 adult harbor seal in kelp east of harbor	Unimpaired	70.9	0.8	1.5	0	<1'
11:00	None	0	0	Male sea lion still in dredge area; 1 adult harbor seal in kelp east of harbor; 4 otters in kelp outside harbor						
11:34	None	0	0	Male sea lion in dredge area; 4 otters in kelp outside harbor; 89 pelicans on breakwater; all work (skiff work) in harbor done; left site	Unimpaired	72.3	0.5	1.9	0	<1'

Harbor Monitoring on July 14, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:36	None	0	0	2 seals in water; 2 otters in kelp east of harbor; 43 brown pelicans on breakwater	Unimpaired	61.8	0.2	0.4	0	71"
07:01	None	0	0	2 seals in water; 7 otters in kelp east of harbor; first equipment starts up						
07:45	None	0	0	5 otters in kelp east of harbor; crane starts running	Unimpaired	62.4	1.6	2.8	0	71"
08:15	None	0	0	5 otters in kelp east of harbor; crane starts moving; 21 pelicans on breakwater						
08:20	None	0	0	1 <sup>st</sup> time crane grabs mud	Unimpaired	63.0	2.4	3.8	0	71"
08:28	None	0	0	Crane begins actively dredging; 6 otters in kelp east of harbor; 23 pelicans on breakwater						
08:48	None	0	0	Crew member walks halfway out onto breakwater; 6 otters in kelp east of harbor; 23 pelicans on breakwater	Unimpaired	61.3	5.3	6.2	0	1-2'
08:51	None	0	0	1 seal alternately basking and diving in harbor within silt curtain about 75yds from the crane bucket, appears unalarmed						
08:57	None	0	0	Seal in harbor no longer visible						
09:30	None	0	0	5 otters in kelp east of harbor; 52 brown pelicans on breakwater	Unimpaired	62.7	5.4	7.3	0	71"
09:41	None	0	0	Fog rolling in, kelp patties with otters no longer visible, 53 pelicans on breakwater	1000yds	62.3	4.8	6.8	5	71"
09:54	None	0	0	Fog rolling in, kelp patties with otters no longer visible, 36 pelicans on breakwater	200yds	60.9	4.5	5.4	10	1-2'
10:25	None	0	0	Fog rolling in, kelp patties with otters no longer visible, 44 pelicans on breakwater	200yds	63.7	0.9	5.4	10	1-2'

Harbor Monitoring on July 15, 2009. Monitoring during harbor dredging activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
07:30	None	0	0	56 brown pelicans on breakwater; actively dredging with crane; haul-out submerged	200yds	58.3	2.9	2.2	100	3'
08:00	None	0	0	58 brown pelicans on breakwater; haul-out submerged; kelp where otters have been rafting is not visible due to fog	200yds	58.3	2.3	3.0	100	3'
08:05	None	0	0	Shut down crane engines and stopped dredging						
08:16	None	0	0	Harbor seal in harbor within silt curtains bordering the north side of the kelp mitigation area	300yds					
08:21	None	0	0	Restart crane briefly						
08:23	None	0	0	Sea lion porpoised just beyond breakwater						
08:24	None	0	0	Restart crane and resume dredging						
08:30	None	0	0	68 brown pelicans on breakwater	250yds	58.1	1.4	3.1	100	3'
09:00	None	0	0	78 pelicans on breakwater, 5 on haul-out; lower shelf of large haul-out rock exposed	250yds	56.3	3.0	3.7	100	3'
09:15	None	0	0	Harbor seal swam through outer harbor (did not appear concerned by crane); many fish jumping in water	500yds					
09:19	None	0	0	2 harbor seals observed diving and resurfacing repeatedly on outskirts of harbor amid jumping fish (appear to be foraging)						
09:25	None	0	0	Harbor seal swam through haul-out area						
09:30	None	0	0	87 pelicans on breakwater, 4 on haul-out; still too foggy to see kelp patties; seals still foraging on outer edge of harbor	600yds	56.5	3.2	4.6	100	3'
09:36	None	0	0	2 harbor seals swimming by haul-out; 2 seals foraging in harbor area amid jumping fish with in 75yds of crane						
10:00	None	0	0	Lower haul-out rocks were never exposed; 109 pelicans on breakwater, 4 on haul-out; 2 seals still foraging on outskirts of the harbor	400yds	56.6	4.0	4.2	100	3'
10:02	None	0	0	Seal swam by haul-out (lower ledge of large haul-out rock being hit by waves)						
10:06	None	0	0	4 harbor seals outside harbor foraging (diving and resurfacing in vicinity of jumping fish)						
10:30	None	0	0	4 harbor seals outside harbor foraging; pelicans diving by haul-out; 117 pelicans on breakwater, 8 on haul-out; left at 10:30	400yds	56.0	3.4	3.6	100	3'

Harbor Monitoring on July 20, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:50	None	0	0	43 brown pelicans on haul-out; lower haul-out rocks submerged; 2 otters rafting, 1 foraging in kelp outside harbor; at least 3 seals sleeping in kelp outside harbor	Unimpaired	60.0	0.9	1.1	5	3.5'
07:02	None	0	0	Equipment engine starts; 49 pelicans on haul-out; 5 otters rafting outside harbor; skiff lowered into water	Unimpaired	63.3	0.6	1.6	5	3.5'
07:28	<i>Zalophus californianus</i>	0	1	1 sea lion on outside of breakwater, some small wounds present, very thin, movements seem abnormal and animal does not appear very alert						
07:54	<i>Zalophus californianus</i>	0	1	Sea lion climbed to top of breakwater						
08:00	<i>Zalophus californianus</i>	0	1	11 pelicans on breakwater, 58 on haul-out; 5 otters rafting outside harbor	Unimpaired	64.4	1.3	2.0	5	3.5'
08:04	<i>Zalophus californianus</i>	0	1	Large wave knocks ~1/2 of the pelicans off the haul-out	Unimpaired	66.3	1.1	2.6	5	4
08:30	<i>Zalophus californianus</i>	0	1	92 brown pelicans on breakwater; 5 otters rafting outside harbor						
08:58	<i>Zalophus californianus</i>	0	1	Started running loader, sea lion roused and held nose in the air prior to resettling	Unimpaired	66.3	0.8	1.9	5	4
09:00	<i>Zalophus californianus</i>	0	1	143 pelicans on breakwater;	Unimpaired	64.1	2.1	1.2	5	4
09:30	<i>Zalophus californianus</i>	0	1	188 pelicans on breakwater, 5 otters rafting outside harbor suddenly dove (no discernable cause)						
10:00	<i>Zalophus californianus</i>	0	2	Remainder of activities will be restricted to dock (out of view of sea lions); 198 pelicans on breakwater; 5 otters rafting outside harbor; the additional sea lion is a small juvenile hauled out at the far end of the breakwater; left site at 10:05	Unimpaired	70.2	1.5	2.6	5	4
13:28-13:42	<i>Zalophus californianus</i>	0	2	Returned to re-check sea lion status: small juvenile is still at the end of breakwater, the sick animal has moved to the inner side (north side) of the breakwater about midway out	Unimpaired	81.7	2.1	5.1	5	4-6'
15:15	<i>Zalophus californianus</i>	0	2	Sea lion positions unchanged						

Harbor Monitoring on July 21, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:45	<i>Phoca vitulina</i>	19	0	91 pelicans on breakwater, 29 on haul-out; 7 otters rafting in patty outside harbor	Unimpaired	59.8	1.0	1.5	5	3'
06:55	<i>Phoca vitulina</i>	17	0	Tide coming in, 2 seals washed off rocks						
06:57	<i>Phoca vitulina</i>	13	0	4 seals washed off rocks						
07:01	<i>Phoca vitulina</i>	8	0	5 seals washed off rocks, 119 pelicans on breakwater, 32 on haul-out; 6 otters rafting and 1 foraging outside harbor	Unimpaired	63.3	1.6	2.9	5	3'
07:07	<i>Phoca vitulina</i>	5	0	3 seals left due to rising tide, remaining seals hit by every wave						
07:08	<i>Phoca vitulina</i>	3	0	2 seals washed off rocks						
07:10	<i>Phoca vitulina</i>	2	0	1 seal washed off rocks						
07:11	<i>Phoca vitulina</i>	1	0	1 <sup>st</sup> engine starts, only seal barely managing to stay on rocks, no reaction to noise						
07:15	<i>Phoca vitulina</i>	0	0	Last seal washed off rock						4-6'
07:30	None	0	0	Equipment starts moving on dock; the 6 otter outside of the harbor dove for unknown reason, the bird next to them in the kelp was undisturbed; 140 pelicans on breakwater, 35 on haul-out	Unimpaired	63.9	0.9	1.7	5	4-6'
07:48	None	0	0	2 otters resurface and resume rafting east of their original position						
08:00	None	0	0	174 pelicans on breakwater, 43 on haul-out; 3 otters rafting and 4 seals in kelp outside harbor	Unimpaired	63.5	1.2	1.9	5	4-6'
08:30	None	0	0	215 pelicans on breakwater, 39 on haul-out; 4 otters rafting and 4 seals sleeping in kelp outside harbor	Unimpaired	62.3	1.9	2.5	5	4-6'
09:00	None	0	0	293 pelicans on breakwater, 38 on haul-out; 4 otters rafting and 3 seals sleeping in kelp outside harbor; dredging activities have been restricted to running equipment on the dock and the floating barge within a foot of the dock; left at 9:05	Unimpaired	70.7	1.7	2.3	5	3-6'

Harbor Monitoring on July 22, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:43	<i>Phoca vitulina</i>	24	0	188 pelicans on breakwater, 2 otters rafting outside harbor	Unimpaired	64.6	0	0	5	3-6'
06:56	<i>Phoca vitulina</i>	27	0	236 pelicans on breakwater, 5 otters rafting outside harbor	Unimpaired	64.4	0	0	5	3-6'
07:05	<i>Phoca vitulina</i>	25	0	Some of the lower haul-out rocks starting to get hit bay waves, 2 seals re-enter water						
07:07	<i>Phoca vitulina</i>	24	0	1 seal washed off rocks						
07:10	<i>Phoca vitulina</i>	25	0	1 seal hauls out, excavator engine starts						
07:12	<i>Phoca vitulina</i>	25	0	Excavator arm starts moving, no reaction from seals						
07:14	<i>Phoca vitulina</i>	24	0	1 seal washed off rocks, excavator stops						
07:18	<i>Phoca vitulina</i>	23	0	1 seal washed off rocks						
07:23	<i>Phoca vitulina</i>	12	0	Loud clang from wheel barrow being unloaded from excavator bucket flushes 11 seals and 91 pelican from the breakwater; flushing may have been due to a combination of the noise and the large number of pelicans flushing	Unimpaired	64.5	0.7	1.3	5	3-6'
07:26	<i>Phoca vitulina</i>	9	0	3 seals enter water as waves hit; 23 pelicans on haul-out, 96 on breakwater						
07:30	<i>Phoca vitulina</i>	8	0	1 seal washed off rocks; 36 pelicans on haul-out, 109 on breakwater						
07:34	<i>Phoca vitulina</i>	8	0	Excavator engine restarts and arm starts moving, no reaction from seals						
07:36	<i>Phoca vitulina</i>	7	0	1 seal washed off rocks						
07:36	<i>Phoca vitulina</i>	6	0	1 sea washed off rocks						
07:38	<i>Phoca vitulina</i>	6	0	Loud bangs as excavator loads barge (equal volume to wheel barrow) no reaction from seals, 62 pelicans flush off breakwater						
07:39	<i>Phoca vitulina</i>	4	0	Continued excavator movement flushes 7 pelicans off breakwater; 2 seals washed off rocks						
07:40	<i>Phoca vitulina</i>	4	0	Excavator stops						
07:41	<i>Phoca vitulina</i>	3	0	1 seal washed off rocks; 86 pelicans on haul-out (most are birds that re-settled there after being flushed off breakwater), 10 pelicans on breakwater						
07:44	<i>Phoca vitulina</i>	2	0	1 seal washed off rocks	Unimpaired	72.1	0	0	5	3-6'
07:45	<i>Phoca vitulina</i>	1	0	1 seal washed off rocks, only remaining seal is on the highest haul-out site; 5 otters rafting in kelp outside the harbor						
07:54	<i>Phoca vitulina</i>	1	0	Remaining seal starting to get splashed by waves						
08:00	<i>Phoca vitulina</i>	1	0	32 pelicans on breakwater, 88 on haul-out; 6 otters and 2 seals in kelp outside harbor						
08:08	<i>Phoca vitulina</i>	0	0	Last seal enters water; 109 pelicans on breakwater, 98 on haul-out	Unimpaired	69.6	1.2	3.3	5	3-7'
08:12	None	0	0	Excavator starts operating / moving						
08:30	None	0	0	290 pelicans on breakwater, 79 on haul-out; 5 otters rafting outside harbor	Unimpaired	78.5	0.9	2.1	5	3-7'
09:00	None	0	0	342 pelicans on breakwater, 72 on haul-out; 6 otters rafting outside harbor; left at 9:13						

Harbor Monitoring on July 23, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:50	<i>Phoca vitulina</i>	26	1	Juvenile is a pup from this season, still silver, but independent; 94 pelicans on low haul-out rocks with seals; 3 otters rafting in kelp outside harbor	Unimpaired	56.8	3.1	5.8	10	3-6'
07:00	<i>Phoca vitulina</i>	27	1	88 pelicans on low haul-out rocks, 1 pelican on breakwater, 5 otters rafting in kelp outside of harbor						
07:06	<i>Phoca vitulina</i>	27	1	Excavator engine starts and series of large swells wash over lower rocks upsetting pelicans						
07:09	<i>Phoca vitulina</i>	27	1	Excavator arm starts moving						
07:10	<i>Phoca vitulina</i>	27	1	Excavator shuts down						
07:11	<i>Phoca vitulina</i>	28	1	88 pelicans on low haul-out rocks, 1 pelican on breakwater, 5 otters rafting in kelp outside of harbor						
07:17	<i>Phoca vitulina</i>	27	1	2 seals frequently entering and exiting water						
07:20	<i>Phoca vitulina</i>	24	0	Rising water / wave impact causes pelicans to flush; the pup and 3 adult seals flush into water						
07:23	<i>Phoca vitulina</i>	25	0							
07:25	<i>Phoca vitulina</i>	21	0	Series of large swells impact rocks causing seal to alert and 4 enter the water						
07:27	<i>Phoca vitulina</i>	21	0	Generator starts on barge, no reaction from seals	Unimpaired	57.6	4.1	8.3	10	3-7'
07:30	<i>Phoca vitulina</i>	21	0	9 seals on rocks hardest hit by waves maintaining alert demeanor (raised heads, open eyes), 5 otters and 3 seals in kelp outside of harbor, 1 pelican on breakwater						
07:36	<i>Phoca vitulina</i>	21	0	All seals relaxed						
07:42	<i>Phoca vitulina</i>	20	0	Large swells starting to regularly wash over lower rocks, 1 seal entered water; 12 pelicans on breakwater						
07:44	<i>Phoca vitulina</i>	20	0	Forklift starts operating on dock, no reaction from seals						
07:45	<i>Phoca vitulina</i>	15	0	5 seals washed off rocks						
07:46	<i>Phoca vitulina</i>	17	0	Forklift flushes 11 pelicans off breakwater, 2 seals haul out; forklift stops						
07:48	<i>Phoca vitulina</i>	16	0	Large swell washes 1 seal off rocks others barely hang on; 1 pelican on breakwater, 1 on haul-out						
07:49	<i>Phoca vitulina</i>	17	0							
07:50	<i>Phoca vitulina</i>	16	0	Seal that hauled out at 07:49 washed back off rocks						
07:52	<i>Phoca vitulina</i>	16	0	Engine starts, no reaction from seals						
07:54	<i>Phoca vitulina</i>	14	0	2 seals washed off rocks; 1 pelican on breakwater, 12 on haul-out						
08:00	<i>Phoca vitulina</i>	14	0	1 pelican on breakwater, 15 on haul-out; 6 otters rafting and 1 foraging in kelp outside of the harbor	Unimpaired	60.2	2.6	6.9	6	3-7'
08:02	<i>Phoca vitulina</i>	9	0	5 seals washed off rocks; individuals using some type of mechanical sander / file emitting a loud buzzing noise to strip old paint from gabian at the foot of the breakwater, activities visible from haul-out, no reaction from seals						
08:05	<i>Phoca vitulina</i>	7	0	2 seals washed off rocks						
08:08	<i>Phoca vitulina</i>	6	0	1 seal washed off rocks						
08:11	<i>Phoca vitulina</i>	5	0	1 seal washed off rocks						
08:12	<i>Phoca vitulina</i>	4	0	1 seal spotted large swell coming in and entered water preemptively						
08:14	<i>Phoca vitulina</i>	3	0	1 seal washed off rocks						
08:15	<i>Phoca vitulina</i>	2	0	1 seal washed off rocks						
08:16	<i>Phoca vitulina</i>	1	0	1 seal washed off rocks						
08:17	<i>Phoca vitulina</i>	0	0	Remaining seal washed off rocks; 17 pelicans on haul-out; 7 seals and 0 otters in kelp outside of harbor						
08:30	None	0	0	13 pelicans on haul-out, 1 on breakwater; 6 otters rafting and 1 foraging in kelp outside harbor	Unimpaired	64.3	1.8	2.8	5	3-10'
08:41	None	0	0	1 seal briefly sighted in harbor ~25' from barge	Unimpaired	66.3	0.7	2.2	5	3-6'
09:00	None	0	0	6 otters rafting outside harbor; 1 pelican on breakwater, 17 on haul-out; 1 sea lion briefly observed swimming in harbor	Unimpaired	64.9	2.2	4.3	5	3-6'
09:30	None	0	0	4 otters rafting in kelp outside harbor; 1 pelican on breakwater, 4 on haul-out; left at 9:35	Unimpaired					

Harbor Monitoring on July 24, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:58	<i>Phoca vitulina</i>	24	0	2 sea otters in kelp east of harbor, 18 brown pelicans perched	Unimpaired	55.9	5.2	8.9	10	5'
07:16	<i>Phoca vitulina</i>	0	0	Excavator started up and arm moved, all seals flushed, 9 in view in water	Unimpaired	55.9	4.7	9.2	10	5'
07:23	<i>Phoca vitulina</i>	1	0	3 seals in water, 3 otters in kelp east of harbor	Unimpaired	56.4	4.2	5.8	10	5'
07:30	<i>Phoca vitulina</i>	3	0	2 seals in water, 3 otters in kelp east of harbor						
07:33	<i>Phoca vitulina</i>	4	0	4 seals in water, 3 otters in kelp east of harbor						
07:38	<i>Phoca vitulina</i>	5	0	1 seals in water, 1 otter in kelp east of harbor						
08:03	<i>Phoca vitulina</i>	4	0	Waves starting to wash over rocks	Unimpaired	59.3	3.8	5.6	10	5'
08:04	<i>Phoca vitulina</i>	4	0	2 seals in cove along shore watching surfers entering water						
08:09	<i>Phoca vitulina</i>	3	0	6 otters in southeast kelp, 1 seal in east kelp						
08:24	<i>Phoca vitulina</i>	0	0	6' wave set washed over rocks, 2 seals in east kelp, 3 pelicans on breakwater	Unimpaired	60.3	1.7	5.9	10	6'
08:45	None	0	0	4 otters and 2 seals in southeast in kelp east of harbor, 1 female sea lion observed in cove for 5 minutes (no equipment running), 4 pelicans on breakwater	Unimpaired	62.3	5.5	8.3	30	5'
08:58	None	0	0	Female sea lion moved out of cove, 4 otters in kelp east of harbor, 4 pelicans on breakwater	Unimpaired	63.9	0.7	1.3	25	6'
09:19	None	0	0	1 brown pelican on breakwater, no otters or pinnipeds present						
09:28	None	0	0	1 seal in cove (observed for 3 min), 3 brown pelicans on breakwater; left at 10:03	Unimpaired	65.5	4.7	10.1	25	6'

Harbor Monitoring on July 27, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:50	<i>Zalophus californianus</i>	0	1	34 pelicans on haul-out, 234 pelicans on breakwater; lower haul-out submerged, kelp patties outside harbor not visible; sea lion sleeping at north end of beach	200yds	57.1	1.2	1.5	100	3-4'
07:01	<i>Zalophus californianus</i>	0	1		200yds	58.1	0.7	1.2	100	3-4'
07:22	<i>Zalophus californianus</i>	0	1	1 seal swam by haul-out						
07:26	<i>Zalophus californianus</i>	0	1	Excavator starts up, no reaction from sea lion (not visible from its location)						
07:42	<i>Zalophus californianus</i>	0	1	Excavator stops						
07:45	<i>Zalophus californianus</i>	0	1	Fog so dense that the haul-out area and end of breakwater are not visible.	150yds	62.6	0	0.7	100	3-4'
08:00	<i>Zalophus californianus</i>	-	-	Still 200+ pelicans on breakwater, sea lion no longer visible due to fog	75yds					
08:15	<i>Zalophus californianus</i>	0	1	Sea lion barely discernable	90yds					
08:26	<i>Zalophus californianus</i>	0	1	40 pelicans on haul-out (still too foggy to count breakwater: at least 200 there; tide not receding low enough to make the haul-out rocks usable by seals	90-110yds	62.6	0	0.7	100	3-4'
08:40	<i>Zalophus californianus</i>	0	2	Second sea lion hauling out on rocks at south end of beach, laceration near eye and severe injury to hindquarters: large open wound, unable or unwilling to move rear flippers						
09:00	<i>Zalophus californianus</i>	0	2	Still too foggy to count pelicans; clear above, but dense fog still hugging much of the ground	100yds	65.0	1.0	1.6	50	4-5'
09:11	<i>Zalophus californianus</i>	0	1	2 individuals went out on breakwater to inspect kelp mitigation area, injured sea lion re-entered water (no mobility in hind quarters) but stayed close to shore; 100+ pelicans flushed; other individuals out on dolphins prepping gabians for painting; sea lion on north end of beach starting to slowly work its way towards the water						
09:13	<i>Zalophus californianus</i>	0	1	95 pelicans on haul-out and 269 on breakwater						
09:22	<i>Zalophus californianus</i>	0	0	Remaining sea lion entered water (not stimulated by any disturbance); injured sea lion still in water west of the breakwater						
09:46	<i>Zalophus californianus</i>	0	1	Injured sea lion partially hauled out on rock just offshore	700yds	65.0	1.0	1.6	50	4-5'
10:00	<i>Zalophus californianus</i>	0	1	Injured sea lion hauled out on rock just offshore; 3 otters raft and 4 seals sleeping in kelp outside of the harbor; 72 pelican on haul-out and 396 on breakwater	Unimpaired	62.0	1.9	2.4	4	3-5'
10:13	<i>Zalophus californianus</i>	0	1	Injured sea lion's rock starting to get overwashed by waves						
10:14	<i>Zalophus californianus</i>	0	0	Injured sea lion being hit by waves harassed by western gull (gull trying to pick at wound) causing the animal to re-enter the water.						
10:27	None	0	0	Injured sea lion sighted ~200yds offshore heading north, appeared to be relying entirely on upper body for propulsion	Unimpaired	65.5	2.7	3.5	2	3-5'
10:32	None	0	0	7 otters (3 likely obscured by birds during previous count) rafting in kelp outside of harbor, 63 pelicans on haul-out and 285 on breakwater; left site at 10:45						

Harbor Monitoring on July 28, 2009. Monitoring during harbor dredging and maintenance activities

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:45	<i>Zalophus californianus</i>	0	1	Sea lion at far end of beach; 169 pelicans on breakwater; 5 otters rafting in kelp ~600yds outside of harbor; sealion looks like same individual hauled out on previous day at same location (~2 yr female)	Unimpaired	58.2	1.5	5.8	15	3-5'
07:00	<i>Zalophus californianus</i>	0	1	192 pelicans on breakwater; 3 otters rafting in kelp ~600yds outside of harbor	Unimpaired	57.0	5.2	10.8	15	3-5'
07:07	<i>Zalophus californianus</i>	0	1	07:07 equipment engine starts						
07:23	<i>Zalophus californianus</i>	0	1	harbor seal swims through haul-out area						
07:30	<i>Zalophus californianus</i>	0	1	Crane on barge at the base of the dock starts moving; not visible to the sea lion and no reaction to noise; at least 5 otters rafting / swimming and 4 seals in kelp outside of harbor	Unimpaired	57.0	5.2	10.8	15	3-5'
07:32	<i>Zalophus californianus</i>	0	1	2 seals swim through haul-out area; all rocks submerged						
07:55	<i>Zalophus californianus</i>	0	1	Dolphin swam by just beyond breakwater, heading north						
08:00	<i>Zalophus californianus</i>	0	1	Sea lion sound asleep; 219 pelicans on breakwater; 9 otters rafting in kelp ~600yds outside of harbor	Unimpaired	63.1	2.3	5.7	10	3-5'
08:20	<i>Zalophus californianus</i>	0	1	Individual went out on breakwater to take documentation photos of kelp mitigation area, flushed ~100 pelicans which re-landed after making a circuit of the harbor						
08:30	<i>Zalophus californianus</i>	0	1	1 seal swam through the haul-out area; crew assembling dredging arm						
08:46	<i>Zalophus californianus</i>	0	1	Sea lion moved ~10' closer to water						
09:00	<i>Zalophus californianus</i>	0	1	Sea lion moving towards water, 275 pelicans on breakwater; 8 otters rafting and 4 seals sleeping in kelp ~600yds outside of harbor	Unimpaired	71.0	0.9	3.3	5	3-5'
09:05	<i>Zalophus californianus</i>	0	0	Sea lion entered water						
09:41	None	0	0	Harbor seal swam by haul-out area; tide never got low enough to expose lower haul-out rocks and the haul-out area on the large / high rock was only briefly exposed						
10:00	None	0	0	270 pelicans on breakwater; 7 otters rafting and 3 seals sleeping in kelp ~600yds outside of harbor; left at 10:20	Unimpaired	70.0	4.5	11.8	5	3-5'

Harbor Monitoring on August 3, 2009

Monitoring during demobilization and harbor maintenance activities: will be demobilizing all week, dredging is over, the sediment accumulated from dredging will be hauled off this afternoon and the barge will be pulled tomorrow; the remainder of the week will be spent painting gabians and pulling out equipment.

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:51	<i>Phoca vitulina</i>	2	0	2 seals on high haul-out; being hit by waves	Unimpaired	59.9	5.0	13.5	50	3-4'
06:53	<i>Phoca vitulina</i>	1	0	1 seal enters water						
06:56	<i>Phoca vitulina</i>	0	0	1 seal enters water; 2 otters rolling around in kelp outside harbor; very choppy						
07:06	None	0	0	All haul-out under water; otters still "horsing around"	Unimpaired	60.3	7.1	14.6	50	3-4'
07:19	None	0	0	5 otters and 2 seals in kelp ~600 yds outside harbor						
07:23	None	0	0	5 otters and 2 seals in kelp ~600 yds outside harbor; 1 pelican on haul-out						
07:30	None	0	0	5 otters and 2 seals in kelp ~600 yds outside harbor; left at 07:37	Unimpaired	60.0	7.0	15.6	50	3-4'

Harbor Monitoring on August 4, 2009

Monitoring during demobilization and harbor maintenance activities; equipment not started during monitoring period

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:50	<i>Phoca vitulina</i>	2	0	Very windy, both seals hauled out on large/high haul-out and being hit by waves and unable to relax, 2 otters and 4 seals in kelp ~ 600 yds outside harbor	Unimpaired	60.2	11.2	20.8	2.5	4-5'
07:06	<i>Phoca vitulina</i>	2	0	1 seal swam by haul-out						
07:07	<i>Phoca vitulina</i>	1	0	1 seal entered water after being hit by wave						
07:10	<i>Phoca vitulina</i>	0	0	Remaining seal gradually slid into water amid series of wave impacts						
07:30	None	0	0	4 seals in kelp ~ 600 yds outside harbor; too much wind and chop to locate otters (1.5-2' wind waves)	Unimpaired	59.0	16.7	26.7	25	2-5'
07:45	None	0	0	No seals visible in kelp, otters may not be discernable due to weather conditions; left at 07:50	Unimpaired	60.1	15.5	24.4	25	2-5'

Harbor Monitoring on August 5, 2009

Monitoring during demobilization and harbor maintenance activities, barge had been dismantled and removed to dock and all but one lamp post re-installed the previous day.

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:55	<i>Phoca vitulina</i>	2	0	Lower haul-out rocks barely exposed, one seal on lower haul-out one on large haul-out rock	Unimpaired	61.0	4.9	9.7	10	4'
06:58	<i>Phoca vitulina</i>	1	0	Lower seal washed off rocks						
06:59	<i>Phoca vitulina</i>	0	0	Upper seal hit by large wave and washed off; 5 otters and 1 seal ~600 yds outside of harbor in kelp	Unimpaired	61.0	4.9	9.9	10	4'
07:18	<i>Phoca vitulina</i>	0	0	Equipment engines started						
07:30	<i>Phoca vitulina</i>	0	0	3 otters and 3 seals ~600 yds outside of harbor in kelp; high haul-out rock being overwashed by every wave	Unimpaired	67.1	5.7	10.6	5	4'
07:45	<i>Phoca vitulina</i>	0	0	2 dolphins circled repeated just south of haul-out area before proceeding north						
08:00	<i>Phoca vitulina</i>	0	0	7 otters and 2 seals ~600 yds outside of harbor in kelp; left at 08:15	Unimpaired	68.0	7.4	11.7	5	2-4'

Harbor Monitoring on August 6, 2009

Monitoring during demobilization and harbor maintenance activities (removal of silt curtain on north side of kelp mitigation area)

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:55	<i>Phoca vitulina</i>	17	0	Lower haul-outs hit by waves	Unimpaired	65.1	1.7	4.0	50	~5'
07:02	<i>Phoca vitulina</i>	18	0							~6'
07:06	<i>Phoca vitulina</i>	15	0	3 seals washed off rocks, 4 southern sea otters rafting in kelp ~600 yds outside of harbor						
07:09	<i>Phoca vitulina</i>	10	0	5 seals washed off rocks						
07:10	<i>Phoca vitulina</i>	7	0	3 seals washed off rocks						
07:10	<i>Phoca vitulina</i>	5	0	2 seals washed off rocks						
07:12	<i>Phoca vitulina</i>	4	0	1 seal washed off rocks						
07:13	<i>Phoca vitulina</i>	3	0	1 seal washed off rocks, equipment engine starts						
07:15	<i>Phoca vitulina</i>	4	0	4 <sup>th</sup> seal hauls out on large haul-out rock						
07:17	<i>Phoca vitulina</i>	0	0	1 seal alerts and flushes into water causing the other 3 to flush; flock of birds flying in to land on haul-out only discernable cause; 1 brown pelican on haul-out	Unimpaired	66.8	1.0	2.3	50	~1-6'
07:28	None	0	0	7 otters rafting in kelp and 2 seals ~600 yds outside of harbor; 1 seal swam around submerged haul-out						
07:37	None	0	0	Forklift lowers skiff into harbor, 5 brown pelicans on haul-out						
07:44	None	0	0	1 sea lion porpoising ~40' off boat dock, making several circuits of the harbor area, present for ~10 min. as personnel on the skiff undid the ties anchoring the silt curtain to the dolphins	Unimpaired	65.7	4.1	11.4	50	~1-6'
08:00	None	0	0	7 otters rafting in kelp and 3 seals ~600 yds outside of harbor; 11 pelicans on haul-out. Forklift being used to reel in silt curtain flushing the gulls off of the break water. One seal swam into the harbor at 8:13 and lingered briefly in area formerly occupied by the silt curtain						
08:23	None	0	0	3 otters rafting in kelp and 2 seals ~600 yds outside of harbor	Unimpaired	69.6	2.8	7.1	65	~1-6'
08:30	None	0	0	2 otters rafting in kelp and 2 seals ~600 yds outside of harbor; 9 pelicans on haul-out						

Harbor Monitoring on August 7, 2009

Monitoring during harbor maintenance activities: gabians atop dolphins being painted

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
06:55	<i>Phoca vitulina</i>	11	0	1 southern sea otter rafting approximately 600 yds outside harbor	Unimpaired	59.6	4.1	8.5	3	~2
07:00	<i>Phoca vitulina</i>	10	0							
07:00	<i>Phoca vitulina</i>	11	0							
07:01	<i>Phoca vitulina</i>	10	0	11 <sup>th</sup> only hauled out briefly, the lower haul-out rocks are being regularly impacted by waves, 3 southern sea otter rafting approximately 600 yds outside harbor	Unimpaired	60.3	4.8	11.5	3	~2-4
07:18	<i>Phoca vitulina</i>	8	0	2 seals washed off of lower haul-out rocks by waves, 1 brown pelican on haul-out						
07:21	<i>Phoca vitulina</i>	6	0	2 seals washed off of lower haul-out rocks by waves						
07:26	<i>Phoca vitulina</i>	5	0	1 seal washed off of lower haul-out rocks by waves						
07:28	<i>Phoca vitulina</i>	6	0							
07:29	<i>Phoca vitulina</i>	5	0	Seal that hauled out at 7:28 re-enters water						
07:30	<i>Phoca vitulina</i>	6	0	Forklift drives into dock area, 1 seal hauls out						
07:32	<i>Phoca vitulina</i>	5	0	1 seal washed off of lower haul-out rocks by waves	Unimpaired	61.1	2.3	5.8	3	~2-4
07:34	<i>Phoca vitulina</i>	6	0							
07:35	<i>Phoca vitulina</i>	3	0	3 seals washed off of lower haul-out rocks by waves						
07:36	<i>Phoca vitulina</i>	2	0	1 seal washed off of lower haul-out rocks by waves; 2 remaining seals on large haul-out rock, 1 seal swimming in harbor						
07:39	<i>Phoca vitulina</i>	2	0	Large haul-out being hit by waves, seals can't relax; 5 southern sea otter rafting and 1 harbor seal approximately 600 yds outside harbor						
07:46	<i>Phoca vitulina</i>	0	0	Flock of 12 brown pelicans fly in, 9 land on haul-out making a direct frontal approach on the seals, the flailing of the pelicans prior to landing flushes the 2 remaining seals	Unimpaired	61.9	5.6	12.6	2	~2-5
07:50	None	0	0	Forklift drives down dock and lowers skiff into harbor, trash truck arrives and empties trash bins;; 5 southern sea otters rafting approximately 600 yds offshore, 4 brown pelicans on haul-out						
08:17	None	0	0	2 harbor seals swimming just off the coast east of the harbor; crew from skiff applying top coat of paint to gabians on dolphins						
08:30	None	0	0	7 brown pelicans on haul-out, 1 southern sea otter rafting approximately 600 yds outside of harbor (remaining otters not visible due to glare)	Unimpaired	63.2	5.8	11.6	2	~2-6
08:45	None	0	0	Nothing distinguishable in kelp due to glare, 1 gaban left to paint, 9 brown pelicans on haul-out, 1 harbor-seal swimming through haul-out area						

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Harbor Monitoring on September 17, 2009

Monitoring during equipment staging activities for Delta Mariner

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
13:13	None	0	0	Haul out locations submerged; all equipment on site	Unimpaired	80	2.7	11.2	0	~6'
14:13	None	0	0	Crane operating from dock to place buoys, 1 harbor seal in water between breakwater and haul-out	Unimpaired	83	3.2	12.3	0	~2'
15:13	None	0	0	Crane operation concluded; left site	Unimpaired	82	2.8	11.1	0	~1'

Harbor Monitoring on September 20, 2009. Monitoring during transport period for Delta Mariner

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
15:15	None	0	0	176 brown pelicans on breakwater; 2 otters foraging east of harbor; cargo transport went through just prior to arrival	Unimpaired	74.0	3.3	9.1	5	~2'
15:30	None	0	0	1 otter rafting east of harbor; 199 brown pelicans on breakwater; haul-out rocks still underwater; large flock of royal terns on breakwater with pelicans as well as western and heerman's gulls	Unimpaired	74.5	2.3	7.0	5	~2'
16:00	None	0	0	Lower haul-out rocks starting to break the surface; 0 otters and 142 pelicans on breakwater	Unimpaired	75.0	2.5	6.0	5	~2'
16:20	None	0	0	Pelicans starting to leave breakwater in large groups						
16:30	None	0	0	0 otters, 103 pelicans	Unimpaired	72.0	5.6	10.0	5	~3'
16:32	None	0	0	Harbor seal swimming through the haul-out area; Pinkerton security guard and additional individual walking on beach; low haul-out rocks barely exposed						
16:44	None	0	0	1 seal made half-hearted haul-out attempt						
16:45	<i>Phoca vitulina</i>	1	0							
16:46	<i>Phoca vitulina</i>	1	0	Seal briefly entered and re-exited water; lower haul-out still being hit by waves						
16:48	<i>Phoca vitulina</i>	1	0	4 seal enter haul-out area						
16:49	None	0	0							
16:50	None	0	0	1 seal briefly hauled out and re-entered water						
16:53	<i>Phoca vitulina</i>	1	0	2 individuals left beach						
16:53	<i>Phoca vitulina</i>	2	0							
16:56	<i>Phoca vitulina</i>	3	0							
17:00	<i>Phoca vitulina</i>	3	0	0 otters, 124 pelicans on breakwater	Unimpaired	67.7	4.5	8.1	5	~3'
17:00	<i>Phoca vitulina</i>	2	0	All seals entered water, but 2 almost immediately hauled back out						
17:08	<i>Phoca vitulina</i>	5	0	No more equipment operations will be taking place for the remainder of the day; left site						

Harbor Monitoring on September 21, 2009. Monitoring during transport period and docking of Delta Mariner

Time	Pinniped Species Hauled Out	Adults	Juv.	Notes	Visibility	Temp.	Average Wind Speed	Maximum Wind Speed	Percent Cloud Cover	Estimated Swell Height
4:00	None	0	0	Lights from dock illuminates all offshore rocks, lower bench on large haul-out rock exposed; crew has not begun work (no activity); 1 western gull on rock	190 yds	58.6	1.3	5.9	0	~0.5"
4:30	None	0	0		190 yds	58.6	1.3	5.9	0	~0.5"
5:00	None	0	0	Cranes began moving and transport arrived; Mariner still out in channel; 1 western gull on rock	190 yds	59.7	0.7	1.9	0	~2'
5:30	None	0	0	Cranes still unloading transport box; Mariner still out in channel (tide too low); 1 western gull on rock	190 yds	59.7	0.7	1.9	0	~2'
6:00	None	0	0	Cranes still unloading transport box; sun coming up; 1 western gull on rock	Unimpaired	55.9	1.2	2.3	0	~2-3'
6:30	None	0	0	1 seal in water in front of haul-out; crane still operating	Unimpaired	56.1	0	0.9	5	~3-4'
7:00	None	0	0	40 pelicans on breakwater, crane no longer operating	Unimpaired	54.2	0	0	5	~4'
7:30	None	0	0	1 seal swimming between breakwater and haul-out; no activity on dock	Unimpaired	55.0	0	0	5	~4-5'
7:45	None	0	0	3 seals in water near large haul-out rock; 1 otter; 125 pelicans on breakwater flushed by skiff in the harbor	Unimpaired	58.1	1.4	2.1	1	~4-5'
8:00	None	0	0	Mariner off coast, coming in; lower bench of large haul-out rock still exposed; 2 seals in water	Unimpaired	58.4	1.4	2.1	1	~4-5'
8:31	None	0	0	1 seal in water in front of large haul-out rock; 300 brown pelicans in breakwater	Unimpaired	64.5	1	2	0	~3-4'
8:50	None	0	0	4 seals in water in front of large haul-out rock heads up looking at boat, Mariner offshore	Unimpaired	64.5	1	2	0	~3-4'
9:00	None	0	0	4 seals in water in front of large haul-out rock; rocks half submerged	Unimpaired	66.0	1	2	0	~3-4'
9:30	None	0	0	Haul-outs completely submerged; Mariner docking; left site	Unimpaired	66.0	1	2	0	~3-4'