

**Post-oil spill shorebird surveys of San Francisco Bay and Marin Co.
shoreline, Nov – Dec 2007.**

Contact:

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Purpose:

Our goal was to collect data on number of shorebirds that have been oiled during the *Cosco Busan* spill of 58,000 gallons of bunker oil (spill began November 7, 2007) in two areas where the oiling of the shoreline was heaviest – the east side of central San Francisco Bay from the Bay Bridge north to the Albany Crescent and along the Marin Co. shoreline from the south end of Stinson Beach to the north end of RCA Beach in the Point Reyes National Seashore.

Methods:

Areas surveyed - PRBO biologists surveyed two areas in the San Francisco Bay region: 1) along the east side of central San Francisco Bay from the Emeryville Crescent north to the Albany Crescent (this area called the East Bay), and 2) along the Marin Co. shoreline from the south end of Stinson Beach to the north end of RCA Beach in the Point Reyes National Seashore (this area called Marin Beaches; for maps showing these survey areas, see Attachment 1).

Survey methods – We used an instantaneous type sampling method where we scanned shorebird flocks using a spotting scope. As a shorebird was encountered, we noted what species it was, if it was oiled, what part of the bird's body was oiled, what percent of the area where it was oiled was actually covered with oil, and the physical area where the bird was located. To avoid double-counting birds, we scanned through flocks in one direction and when finished moved to another discrete area with different shorebirds. In the East Bay, we sampled birds from various locations in the region, driving from one area to another, trying to sample birds from all main areas. Two observers did the count; one person (Nils Warnock) did all the scanning on all surveys (including during the Marin Beaches surveys), while another (Sarah Warnock) recorded the data. Both observers helped estimate flock size. Along the Marin Beaches, we walked linear beach segments and scanned almost all the shorebirds that we encountered. Marin Beaches were counted on two different days:

Stinson Beach to Seadrift Spit on one day and then RCA Beach to Duxbury Reef in Bolinas on another day. Data were entered onto hard copy data sheets (see Attachment 2) and then into a computer data base (Attachment 3). If it was not possible to sample every shorebird present, we counted how many shorebirds were in the area.

After each survey, we wrote up a log describing the count and the conditions (Appendix 1) and also attached a map of the area that was surveyed (see Attachment 1).

Results:

Between 29 November and 16 December 2007, we sampled each area (East Bay and Marin Beaches) three times, a week apart, for a total of six samples (Table 1).

Table 1. Shorebird survey dates in 2007 at San Francisco Bay and Marin Co. beaches, California. SB = Seadrift to Stinson Beach, RCA = RCA Beach to Duxbury Reef.

	East Bay	Marin Beaches
Survey 1	29 Nov	30 Nov (SB), 2 Dec (RCA)
Survey 2	6 Dec	7 Dec (SB), 9 Dec (RCA)
Survey 3	13 Dec	15 Dec (SB), 16 Dec (RCA)

Overall, we spent approximately 4 hours/person/survey scanning shorebirds at each area (East Bay and Marin Beaches).

Along the East Bay, we examined from 583 to 658 individual shorebirds per survey for signs of oil, representing from 13 to 17 different shorebird species (Table 2). The percent of shorebirds that we saw with visible oil on them, ranged from 4-8 % of the birds we sampled in the East Bay. Along Marin Co. beaches, we examined from 69-122 individual shorebirds per survey for signs of oil, representing 9 species per survey (Table 2). From 8-14 % of the shorebirds that we sampled along the Marin Beaches has visible oil on them (Table 2).

Table 2. Oiled shorebirds observed during Nov-Dec 2007 surveys. Number spp. = number of shorebirds species seen on survey. Total scanned = the total number of shorebirds scanned for visible oil. Percent oiled = the percent of the total number of shorebirds that were scanned that had visible oil on them. For dates of different surveys see Table 1.

		Survey 1	Survey 2	Survey 3
East Bay	Number spp.	13	17	13
	Total scanned	583	658	585
	Percent oiled	4%	8%	5%
Marin Beaches	Number spp.	9	9	9
	Total scanned	112	90	69
	Percent oiled	13%	8%	14%

Of the 149 shorebirds that were visibly oiled and where we recorded the location of oil on the bird's body, 81% of the birds had visible oil on their under parts (breast, belly, rump, vent), 19 % had visible oil on their sides, 5 % had visible oil on their throat/neck/face, and <1 % (one bird) had visible oil on their legs or wings.

During surveys of segments of East Bay and Marin Beaches, we scanned 21 different species of shorebirds for signs of oil of which 16 species had visible oil on them (Attachment 3). The five most abundant species of shorebirds (calculated as the mean of the three surveys) in the East Bay, in decreasing order of abundance, included the Dunlin, Western Sandpiper, American Avocet, Willet, and Marbled Godwit (Table 3), while for the Marin Beaches the five most abundant species of shorebirds were Black Turnstone, Snowy Plover, Marbled Godwit, Whimbrel and Willet (Table 3).

Table 3. Species of shorebirds observed with visible oil. Proportion oiled = Mean proportion of individuals per survey observed with visible oil on them, by species; only surveys in which a particular species was seen was used to calculate the mean. Mean number = the mean number of each species seen during the three surveys. For East Bay, only those species for which the mean number seen was > 10.0 individuals per survey are listed. All species observed on Marin Beaches listed for comparison.

East Bay			Marin Beaches		
Species	Proportion oiled	Mean Number	Species	Proportion oiled	Mean Number
Sanderling	0.76	13.3	Snowy Plover	0.20	13.7
Whimbrel	0.22	10.0	Whimbrel	0.18	10.7
Black Turnstone	0.10	12.0	Sanderling	0.17	4.3
			Long-billed		
Dunlin	0.08	128.0	Curlew	0.17	9.3
American Avocet	0.06	111.3	Marbled Godwit	0.16	11.7
Willet	0.06	54.3	Black Turnstone	0.15	15.0
Black-bellied Plover	0.04	37.0	Willet	0.14	10.7
Long-billed			Black		
Dowitcher	0.01	20.3	Oystercatcher	0.00	7.0

Dowitcher spp.	0.01	16.0	Black-bellied Plover	0.00	2.7
Marbled Godwit	0.01	40.0	Killdeer	0.00	5.3
Western Sandpiper	0.01	124.7			
Long-billed Curlew	0.00	11.3			

In the East Bay, of the shorebirds for which the mean number seen was > 10.0 individuals per survey, the highest proportion of shorebirds observed with visible oil included, in decreasing order, Sanderling, Whimbrel, Black Turnstones, Dunlin, and American Avocets (Table 3). For Marin Beaches, the top five species of shorebirds observed with visible oil included Snowy Plover, Whimbrel, Sanderling, Long-billed Curlew, and Marbled Godwit (Table 3).

Summary:

Our results show that along the east side of central San Francisco Bay from the Emeryville Crescent north to the Albany Crescent, and along the Marin Co. shoreline from the south end of Stinson Beach to the north end of RCA Beach in the Point Reyes National Seashore the majority of shorebird species that we observed during our three week survey period had encountered oil. Combining all shorebird species, the percent of shorebirds that we scanned and saw with visible oil on them ranged from 4-14 %. In general, a higher percentage of shorebirds examined along the Marin Beaches had visible oil on them than along the East Bay region. Certain species of shorebirds were more likely to be observed with visible oil on them. Species of which, on average, $\geq 10\%$ of all individuals we scanned during a survey had visible oil on them included Sanderling, Whimbrel, Snowy Plover, Long-billed Curlew, Marbled Godwit, Black Turnstone, and Willet. The area that we sampled in the East Bay held approximately 3 % of all the shorebirds counted in San Francisco Bay during a November survey in 2006 (355,774 shorebirds counted in SF Bay, PRBO unpubl. data). Comparable background data for Marin Beaches do not exist.

Appendix 1

Daily log describing surveys for oiled shorebirds in the East bay of San Francisco Bay, CA and along Marin Co. beaches by PRBO Conservation Science biologists

Survey for oiled shorebirds on east side of SF Bay between Emeryville Crescent and Albany Crescent

Date – 29 November 2007

Observers – Nils and Sarah Warnock

Time – 0930-1400

Area covered - east side of SF Bay between Emeryville Crescent and Albany Crescent (areas C5/6, C7, C8, and C9 – PRBO shorebird survey codes)

Description – weather was cool, sunny and calm – good for surveys. Tide was rising and by noon was very high. For first couple of hours, in the Albany Crescent, mudflats were exposed and many shorebirds were feeding. By about 1100, no flats were exposed and shorebirds were heading to roost areas. Our largest concentrations of shorebirds were in the Albany Crescent area (C05/6). Probably about 5000 peeps (mostly WESA and DUNL) and then another few thousand larger shorebirds were feeding there. The beach over by Fleming Point had cleaning crews around it, and no shorebirds were to be seen. The Berkeley Marina area did not have any birds – part of this may have been due to presence of oil-cleaning crews dotted around the shoreline. In the Emeryville Crescent area the tide was covering the flats and we found one large (>400 birds) flock of Willets, godwits, whimbrel and curlews (with a few other species mixed in) roosting on the rip/rap on the north side of the bay there. After going through those birds, we drove over to Aquatic Park on the east side of I-80. We found a flock of dowitchers mixed with some Black-necked Stilts and Greater Yellowlegs. Most of the dowitcher calls that we heard were LBDO. Another roosting flock of American Avocets was also gone through.

Overall, we went through 583 shorebirds of different species and about 4% of the birds we looked at had visible oil on them. I said a bird had no oil on it if I got a clear look at the birds, belly and/or breast and/or sides. Obviously, small amounts of oil on birds would be easily missed so estimates for oiled birds should be considered minimums. None of the birds were heavily oiled – most had small spots on the belly or breast.

Date – 29 November 2007

Number of birds with oil and without oil, by species

species	Oil	No oil	total	Percent of birds oiled
AMAV	3	116	119	0.03
BBPL	0	9	9	0.00

BLTU	1	21	22	0.05
BNST	0	9	9	0.00
DOWI	1	44	45	0.02
DUNL	8	73	81	0.10
GRYE	0	15	15	0.00
LESA	0	8	8	0.00
MAGO	1	54	55	0.02
SEPL	0	4	4	0.00
WESA	1	92	93	0.01
WHIM	3	17	20	0.15
WILL	6	97	103	0.06
Total	24	559	583	0.04

Survey for oiled shorebirds along Stinson Beach from Seadrift Spit to Stinson Beach parking lot

Date – 30 November 2007

Observers – Nils Warnock

Time – 1230-1430

Area covered - Seadrift Spit to Stinson Beach parking lot

Description – weather was cool, sunny and calm – good for surveys. Tide was rising but there were still some mudflats exposed on Bolinas Lagoon when I began. I walked down the beach and recorded each shorebird that I saw. All shorebirds seen were looked at for oil. Overall numbers of shorebirds on the beach were low. Part of this may have been due to tidal flats still being exposed in Bolinas Lagoon. Also at least 8 dogs seen on the beach.

Overall, I saw 6 species of shorebirds totaling 50 birds. Of these birds, 18% had visible oil on them. None of the birds were heavily oiled – most had small spots on the belly or breast.

Results from 30 November 2007 survey

Number of birds with oil and without oil, by species

spp	Oil	No Oil	total	Percent oiled
LBCU	0	1	1	0.00
MAGO	1	12	13	0.08
SAND	1	2	3	0.33
SNPL	4	18	22	0.18
WHIM	1	4	5	0.20
WILL	2	4	6	0.33

Total 9 41 50 0.18

Survey for oiled shorebirds from north side of RCA Beach (PRNS) to just south of Duxbury Reef, Bolinas, Marin Co., CA

Date – 2 December 2007

Observers – Nils Warnock

Time – 1045-1300

Area covered - north side of RCA Beach (PRNS) to just south of Duxbury Reef, Bolinas, Marin Co., CA (2.6 miles)

Description – weather was overcast and very windy; gusts over 20 mph – not great for surveys. Tide was falling but not much change today (from about 1 ft to 3 ft). I walked down the beach and recorded each shorebird that I saw. All shorebirds seen were looked at for oil. Overall numbers of shorebirds on the beach were low. Part of this may have been due to the wind.

Overall, I saw 7 species of shorebirds totaling 62 birds. Of these birds, 8% had visible oil on them. None of the birds seen with oil were heavily oiled – most had small spots on the belly or breast.

Summary from 2 December 2007

species	With oil	No oil	total	%
BLOY	0	8	8	0.00
BLTU	2	26	28	0.07
KILL	0	2	2	0.00
LBCU	1	4	5	0.20
MAGO	1	6	7	0.14
WHIM	1	9	10	0.10
WILL	0	2	2	0.00
Total	5	57	62	0.08

Survey for oiled shorebirds on east side of SF Bay between Emeryville Crescent and Albany Crescent

Date – 6 December 2007

Observers – Nils and Sarah Warnock

Time – 0930-1330

Area covered - east side of SF Bay between Emeryville Crescent and Albany Crescent (areas C5/6, C7, C8, and C9 – PRBO shorebird survey codes)

Description – weather was cool (in the 50s) with on and off rainfall – heavy at times. However, there was not much wind and conditions were pretty good for surveying. When we first got to the East Bay, the tide was high and there were no mudflats exposed. A few shorebirds were roosting out on the big shell mound in the Albany Crescent. Sarah and I then headed over to Golden Gates Fields to the end of Buchanan. We parked there at the west end and then walked out to the lagoon on the Albany Bulb. Tide was high but on the rocks forming the edges of the lagoon out there, we had large numbers of roosting shorebirds. There were probably 2000-3000 peeps roosting on the edge (80% DUNL, 15% WESA, 5% other species) and perhaps another 500 large shorebirds (75% BBPL, 5% LBCU, 5% other). We scanned through these flocks and recorded oiled birds. Near the beginning of the survey, a Merlin attacked and flushed all of the birds up. They then regrouped. We did scans of birds roosting on the south end of the lagoon and then scans of birds roosting on the north end. Near the end of our time here, birds began flying out toward the Albany Crescent.

At about 1100, Sarah and I drove over to the SE corner of the Albany Crescent where the tide was just beginning to fall. We surveyed birds there that we did not get out at the lagoon since many of the birds appeared to be coming from the lagoon. We first surveyed all the American Avocets (not were at the lagoon), and then did MAGO and WILL. Near the end, we also scanned a flock of western sandpipers that were feeding near the edge. After getting a good sample there, we drove over to the Berkeley Marina area, had a quick lunch and then began searching for birds there. We found a small flock of feeding shorebirds near the entrance to the marina, and in these birds we saw the Black-necked Stilt with an old radio-tag that we had seen last week at Aquatic Park, across the highway. One of the Dunlin in this cove was pretty heavily oiled in its belly and breast. We then drove down the frontage road to Point Emory, where the first mudflats were just beginning to be exposed. Here we went through about 25 Sanderling, of which about 70% had at least some visible oil (mostly small amounts) on their breast and belly. Our final stopping place was over at the Emeryville Crescent. Mudflats were being exposed and most of the shorebirds were in the far SE corner of that cove, too far to scan for oil. We did scan various shorebirds that were close enough to see.

Overall, we went through 658 shorebirds of 18 different species and 8% of the birds we looked at had visible oil on them. I said a bird had no oil on it if I got a clear look at the birds, belly and/or breast and/or sides. Obviously, small amounts of oil on birds would be easily missed so estimates for oiled birds should be considered minimums. Three shorebirds that we saw today had pretty significant amounts of oil on them (>10%) – these included a Dunlin, a Sanderling, and an American Avocet.

6 December 2007

Oiled	No Oil	Total	Percent Oil
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AMAV	11	133	144	0.08
BBPL	8	94	102	0.08
BLOY	1	3	4	0.25
BLTU	2	12	14	0.14
BNST	0	3	3	0.00
DOWI	0	2	2	0.00
DUNL	10	152	162	0.06
LBCU	0	29	29	0.00
LBDO	0	15	15	0.00
LESA	1	3	4	0.25
MAGO	0	38	38	0.00
RUTU	0	2	2	0.00
SAND	16	7	23	0.70
SPSA	1	0	1	1.00
SURF	2	8	10	0.20
WESA	1	69	70	0.01
WHIM	1	1	2	0.50
WILL	0	33	33	0.00
Total	54	604	658	0.08

Survey for oiled shorebirds along Stinson Beach from Seadrift Spit to Stinson Beach parking lot

Date – 7 December 2007

Observers – Nils Warnock

Time – 1030-1215

Area covered - Seadrift Spit to Stinson Beach parking lot

Description – weather was cool, sunny and windy (10-20 mph out of the north west) – still pretty good for surveys. Tide was high and falling and there were no mudflats exposed on Bolinas Lagoon when I began. I walked down the beach and recorded each shorebird that I saw. All shorebirds seen were looked at for oil. Overall numbers of shorebirds on the beach were low. Not very many people on the beach but still 4-6 dogs out with owners. Kate P. was out doing a Snowy Plover survey at the same time as my survey so I did not look over the plovers in order to minimize disturbance to them.

Overall, I saw 4 species of shorebirds totaling 30 birds. Of these birds, 13% had visible oil on them. None of the birds were heavily oiled – most had small spots on the belly or breast.

Data from 7 December 2007

Oil	No Oil	Total	Percent
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LBCU	0	4	4	0
MAGO	2	6	8	0.25
WHIM	1	9	10	0.1
WILL	1	7	8	0.13
Total	4	26	30	0.13

Survey for oiled shorebirds from north side of RCA Beach (PRNS) to just south of Duxbury Reef, Bolinas, Marin Co., CA

Date – 9 December 2007

Observers – Nils Warnock

Time – 1400-1630

Area covered - north side of RCA Beach (PRNS) to just south of Duxbury Reef, Bolinas, Marin Co., CA (2.6 miles)

Description – weather was sunny and fairly calm. Temp about 55F - great for surveys. Tide was falling and getting quite low. I walked down the beach and recorded each shorebird that I saw. All shorebirds seen were looked at for oil. Overall numbers of shorebirds on the beach were low.

Overall, I saw 8 species of shorebirds totaling 60 birds. Of these birds, 5% had visible oil on them. None of the birds seen with oil were heavily oiled – most had small spots on the belly or breast. I missed a few flocks of turnstones (totaling about 40 birds) that flew north as I was surveying around RCA beach, otherwise I was able to view most of the shorebirds that I saw.

Summary from 9 December 2007

	Oil	No oil	total	percent
BBPL	0	8	8	0.00
BLOY	0	3	3	0.00
BLTU	2	10	12	0.17
KILL	0	8	8	0.00
LBCU	0	12	12	0.00
SAND	1	5	6	0.17
WHIM	0	4	4	0.00
WILL	0	7	7	0.00
Total	3	57	60	0.05

Survey for oiled shorebirds on east side of SF Bay between Emeryville Crescent and Albany Crescent

Date – 13 December 2007

Observers – Nils and Sarah Warnock

Time – 0930-1330

Area covered - east side of SF Bay between Emeryville Crescent and Albany Crescent (areas C5/6, C7, C8, and C9 – PRBO shorebird survey codes)

Description – weather was cool (in the 40s at the beginning) but clear and calm. Conditions were pretty good for surveying. When we first got to the East Bay, the tide was rising and there were still mudflats exposed. At about 0945, Sarah and I drove over to the SE corner of the Albany Crescent where the tide was pushing birds up to the area where we were by the road. The American Avocets were already roosting as were most of the large shorebirds. We had a flock of about 3000 peeps of which I would guess that 80% were Western Sandpipers, 15% Dunlin and the rest other small shorebirds like Semipalmated Plovers. I first scanned through the avocets but since they were roosting together in a tight bunch I was only able to see a small portion of the birds (a few hundred avocets were there). I suspect that I missed some oiled avocets since I was not able to see the bellies of many birds. After the avocets, I scanned through 200 Western Sandpipers, moving through the flocks to avoid double counting birds. They were in close so I had good looks at these birds.

We then drove down the frontage road to the Emeryville Crescent. Here, mudflats were covered up and birds were roosting. We drove down the north end of the crescent (see map) and found a large roosting flocks of mostly large shorebirds on the rip-rap along the bay. There were roughly 550 large shorebirds (60% Willets, 30% Marbled Godwits, 10% Whimbrel) and perhaps another 300 smaller shorebirds (seemed to be mostly Dunlin with some western sandpipers – could have been more but hard to see in the rocks). We scanned through a sample of these birds.

After we drove over to Point Emery, where the little beach just to the north of the pullout had a group of 45 Sanderling feeding. I was able to scan maybe half of those birds and as last time, most of the birds were oiled if you really looked. Our final stopping place was at Aquatic Park. One of the first birds that we saw was a long-tailed duck (female). We had a large flock of roosting shorebirds there that we were able to scope through. There were about 120 American Avocets and 400 small shorebirds of which 50% were Long-billed Dowitchers (by voice), 30% Dunlin, 10% western sandpipers and the rest least sandpipers and semipalmated plovers.

Overall, we went through 585 shorebirds of 14 different species and 5% of the birds we looked at had visible oil on them. I said a bird had no oil on it if I got a clear look at the birds, belly and/or breast and/or sides. Obviously, small amounts of oil on birds would be easily missed so estimates for oiled birds should be considered minimums. With the exception of some of the Sanderling at Point Emery, most of the shorebirds we saw with oil today had small amounts.

Summaries:

Number of birds with oil and without oil, by species

13 December 2007

	Oiled	No Oil	Total	Percent Oil
AMAV	4	67	71	0.06
BNST	0	12	12	0.00
DOWI	0	1	1	0.00
DUNL	10	131	141	0.07
GRYE	0	1	1	0.00
LBCU	0	5	5	0.00
LBDO	1	45	46	0.02
LESA	0	11	11	0.00
MAGO	0	27	27	0.00
SAND	14	3	17	0.82
SEPL	0	7	7	0.00
WESA	0	211	211	0.00
WHIM	0	8	8	0.00
WILL	3	24	27	0.11
Total	32	553	585	0.05

Summaries:

Survey for oiled shorebirds along Stinson Beach from Seadrift Spit to Stinson Beach parking lot (map attached)

Date – 15 December 2007

Observers – Nils Warnock

Time – 1230 - 1415

Area covered - Seadrift Spit to Stinson Beach parking lot

Description – weather was cool, partly cloudy and calm - pretty good for surveys. Tide was high and still rising and there were mudflats exposed on Bolinas Lagoon when I began. I walked down the beach and recorded each shorebird that I saw. All shorebirds seen were looked at for oil. Overall numbers of shorebirds on the beach were low. Not very many people on the beach but still 5-10 dogs out with owners. Found the roosting Snowy Plover flock so I went through them and looked for oil. One of the plovers was banded (lower right leg – red over dark blue; lower left leg – white over purple) and it has a spot of oil on it just over the right (?) leg. I tried not to spend more time on the plovers

than any other flock of birds that I usually encounter. No visible oil on the beach. I found two freshly dead birds – one was a female Mallard that looked like it had just been killed by a raptor (no visible sign of oil). Another was an adult Western Gull that had been picked clean – it also had no signs of oil on it.

I did one additional survey today that I have not done in the past two weeks. In the harbor of Bolinas Lagoon (location on the attached map), I saw a flock of about 200 Sanderling feeding on the mudflats by the wharf, so I went through part of the flock and looked for oiled birds. I checked out 48 birds and of those, 40 had no visible signs of oil and 8 were oiled to varying degrees (17% of birds I looked at were oiled). I expect there were additional oiled birds but I did not want to double-count.

Overall, for the Stinson Beach survey (excluding the Bolinas Lagoon Sanderling) I saw 7 species of shorebirds totaling 44 birds. Of these birds, 14 % had visible oil on them. None of the birds were heavily oiled – most had small spots on the belly or breast.

Summaries:

Data from 15 December 2007

	Oil	No Oil	Total	Percent	
KILL	0	5	5	5	0.00
LBCU	0	2	2	2	0.00
MAGO	1	6	7	7	0.14
SAND	0	4	4	4	0.00
SNPL	4	15	19	19	0.21
WHIM	0	1	1	1	0.00
WILL	1	5	6	6	0.17
Total	6	38	44	44	0.14

Survey for oiled shorebirds from north side of RCA Beach (PRNS) to Agate Beach parking lot, Bolinas, Marin Co., CA

Date – 16 December 2007

Observers – Nils Warnock

Time – 0930-1045

Area covered - north side of RCA Beach (PRNS) to Agate Beach parking lot, Bolinas, Marin Co., CA

Description – weather was partly cloudy with slight winds gusting over 5 mph; temperature was around 50-55F – good for surveys. Tide was rising due to big swells and I had to rush to get around certain spots where the tide was covering the rocks. Most of the reefs were getting washed over by waves. I walked down the beach and recorded

each shorebird that I saw. All shorebirds seen were looked at for oil. Overall numbers of shorebirds on the beach were low.

At the mouth of the canyon that comes out just north of the RCA beach, there was a sheen on the sand that smelled faintly of oil; otherwise, I did not detect any oil on the beach during my walk (although I did not really look for it).

Overall, I saw 6 species of shorebirds totaling 25 birds. Of these birds, 16% had visible oil on them. None of the birds seen with oil were heavily oiled – most had small spots on the belly or breast. I was able to view most of the shorebirds that I saw.

Summary from 16 December 2007

	Oil	No oil	total	percent
BLOY	0	10	10	0.00
BLTU	1	4	5	0.20
KILL	0	1	1	0.00
LBCU	2	2	4	0.50
WHIM	1	1	2	0.50
WILL	0	3	3	0.00
Total	4	21	25	0.16