Results of the 2010 Survey of the Reintroduced Sea Otter Population in Washington State

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The 2010 Washington sea otter survey was conducted from 12-16 July 2010 and included the inshore area from the South Jetty at the mouth of the Columbia River on the outer Washington coast to Pillar Point in the Strait of Juan de Fuca. Biologists and volunteers from the Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service, U.S. Geological Survey, Olympic Coast National Marine Sanctuary, Quinault Indian Nation, The Seattle Aquarium, and the Point Defiance Zoo and Aquarium participated in the survey. Counting conditions this year were variable with visibility ranging from good to excellent for the ground observer component and poor to very good conditions for the aerial component. During this year's survey, ocean swell was unusually high during the survey window with buoy reports of 12-14 foot swell during the early part of the week. Although swells dropped as the week went on, high swell washing over some traditional rafting areas likely caused some changes in use around areas like Destruction Island, Reef 443, Yellowbanks and Duk Point as waves washed over shallow reef areas used for rafting in the past.

Methods

All of the known sea otter range in Washington was surveyed from a fixed-winged aircraft (Cessna 206) and included coverage of coastal waters from the South Jetty at the mouth of the Columbia River (covered only on 7 July reconnaissance survey), north to Point Grenville (Point Grenville was the starting location for surveys on all other days) and Cape Flattery then east to Tongue Point in the Strait of Juan de Fuca. Ground observers made additional counts from locations at Pt. Grenville, Cedar Creek, Sand Point, Cape Alava, Duk Point (near Seafield Creek), inshore of Father and Son Rocks, and Anderson Point. Typically, two south to north surveys are conducted each day over a period of 3 or 4 days, weather permitting. Thus, when conditions are favorable, six surveys of the entire range are completed.

The 2010 survey total was calculated by summing the highest daily totals for the southern segment (Point Grenville to La Push) and northern segment (La Push to Pillar Point) of the known sea otter range along the Washington coast. The high count this year was the combined total from the southern segment on 16 July and the northern segment on

15 July. This method of splitting the coast at La Push into southern and northern segments, assumes little or no movement between the two segments during our survey period. Examination of survey data from years past, as well as documented movements of instrumented sea otters by USGS researchers in Washington supports this assumption. Large groups (>20) observed from the air were generally estimated and photographed with a digital camera. Digital images were later counted several times for consistency and the resulting numbers were used when 1) image quality of groups was good and ground counts were not available or 2) the aerial count from the digital image was deemed to be more accurate than the coinciding ground count of the same group of otters.

Results

In 2010, aerial counts (# daily surveys) were conducted on 13 (2), 15 (2), and 16 July (1). Although aerial surveys covered the area from Point Grenville to Tongue Point on all survey days, low clouds and fog limited aerial survey coverage of some segments on some days, and precluded counting on 14 July. Ground observers were able to conduct surveys at their respective locations on 13, 14, and 15 July.

The highest count for this year's Washington survey was 1,004 sea otters. The 2006, 2007 and 2008 high sea otter counts were 790, 1,125, and 1,073 otters respectively (Table 1; Figure 1). No survey was completed in 2009. Overall, the finite rate of increase for this population since 1989 is 8.1% ($R^2 = 0.95$). This year, 40 pups were counted during the high count and were observed in groups at Destruction Island, Diamond Rock/North Rock, Giant's Graveyard, north of Cedar Creek, Sand Point, Cape Alava, Duk Point (off Seafield Creek), and inshore of Father and Son Rocks. More pups are now being detected in aerial counts of rafted groups because of the use of digital photography, which allows close examination of animals in a group to accurately identify if pups are present when the digital image is counted. In some cases pups may not appear in the summary because they were not observed during the highest counts. The pup to independent ratio this year was 4.1:100, about half of what we observed in 2008.

Survey results for 2010 indicate growth of the Washington sea otter population continues to remain positive overall (Figure 1). Results from the northern segment (La Push to Pillar Point) indicate that this segment may be approaching equilibrium density. For the segment north of La Push there was little change from 2008 (finite rate 3%, $R^2 = 0.45$), and there still appears to be some quality unoccupied habitat available north of Point of Arches. Sea Otters were again sighted near Anderson Point in Makah Bay, which is the northernmost and most newly established group of reproducing females in Washington (Table 1). In the southern segment (La Push to Point Grenville), the sea otter population seems to have slowed its rate of increase, but overall is still at about 15% per year since 1989 ($R^2 = 0.85$). These results illustrate the importance of continuing annual surveys to monitor population trends and changes in distribution. The disparity in growth between the southern and northern population segments is a perplexing question, especially since we know that in the mid 1990s large numbers of sea otters used the area in the Strait of Juan de Fuca eastward as far as Pillar Point and prey of sea otters is present although patchy in nature throughout this area, yet the population is not expanding into what appears to be suitable habitat.

The distribution of Washington's sea otter population has continued to change in recent years with an increasing and larger proportion of the total Washington sea otter population now occurring in the segment south of La Push (Figure 2). In 2002, the segment south of La Push accounted for about the same percentage of the total population as the northern segment, 49% and 51% respectively. However, by 2008, 60% of the population was distributed south of La Push and 40% was north of La Push. In 2010 the distribution remained essentially unchanged, with 59% south of La Push, and 41% north. Aerial coverage of the area from Neah Bay to Tongue Point was unable to detect any sea otters in the Strait of Juan de Fuca.

The single largest concentration of sea otters continues to be located at Destruction Island with 396 otters counted this year. Consistent with recent surveys, a large male group continues to use the northeast reef and eastern kelp bed areas for resting, while a reproducing female raft is still located at the west end of the island. However this year the largest number ever counted at the west end was recorded, 170. Counts made at other locations in the southern portion of the range indicate that females may be regularly moving between rafting areas located at Destruction Island, Diamond Rock/North Rock (off the mouth of the Hoh River), inshore of Perkins Reef (Rocks 443), and Giants Graveyard.

As in past surveys, we did not include any coverage of inland waters east of Tongue Point, although we are aware of credible sightings of scattered individual sea otters in the San Juan Islands and Puget Sound in recent years. Most of these sightings have been of one or two animals. No groups of multiple animals have been noted from any confirmed inland water sea otter sighting reports to date and we believe the small number of sea otters frequenting the inland waters would not add significantly to the population total. Also of note, the groups that moved into the western Strait of Juan de Fuca during fall and winter months have not been reported since 2000. No sea otters were observed at Tatoosh Island this year. The southernmost sea otters were observed near Brown Point and the northernmost was in Makah Bay. The latter was not included in the total because it was not observed on the survey day used for the total.

Acknowledgements

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Table 1 **. Results of the 2008 and 2010 July sea otter surveys in Washington State.**

	2010			2008		
	Independent	Pup	Total	Independent	Pup	Total
WILLOUGHBY ROCK	0	0	0	1	0	1
SOUTH BEACH CAMPGROUND	0	0	0	2	0	2
NORTH STEAMBOAT CREEK	0	0	0	0	0	0
KALALOCH	0	0	0	1	0	1
BROWNS POINT	0	0	0	1	0	1
NORTH BROWN PT.	2	0	2	1	0	1
DESTRUCTION I.	391	5	396	388	14	402
HOH RIVER MOUTH	0	0	0	3	0	3
Middle Rk/DIAMOND ROCK	193	1	194	135	12	147
NORTH ROCK	0	0	0	66	9	75
HOH HEAD	0	0	0	1	0	1
PERKINS REEF (ROCK 443)	0	0	0	1	0	1
WEST ALEXANDER ISLAND	0	0	0	0	0	0
TOLEAK/STRAWBERRY PT.	0	0	0	1	0	1
GIANTS GRAVEYARD	2	1	3	7	3	10
RIALTO BEACH	1	0	1	0	0	0
S. CAPE JOHNSON/CHILEAN MEMORIAL	16	4	20	26	2	28
CAPE JOHNSON/BLUFF PT.	171	0	171	144	4	148
SANDY I.	27	1	28	0	0	0
JAGGED ISLAND	1	0	1	0	0	0
CEDAR CRK./NOR. MEM.*	20	2	22	36	3	39
YELLOW BANKS AREA	11	0	11	42	4	46
SAND PT.*	16	3	19	21	6	27
INSHORE WHITE ROCK /WEDDING ROCKS*	5	1	6	2	0	2
WEDDING ROCKS	2	0	2	2	0	2
OZETTE I.	4	0	4	9	1	10
OZETTE/CAPE ALAVA/BODELTEH*	54	14	68	43	8	51
DUK PT.*[1]	21	3	24	33	5	38
FATHER AND SON*	20	5	25	14	9	23
ANDERSON PT.*	7	0	7	13	0	13
	964	40	1004	993	80	1073

* Counted from land-based stations.

Figure 1. Growth of Washington sea otter population, showing 3-yr running average of counts, 1989-2010.

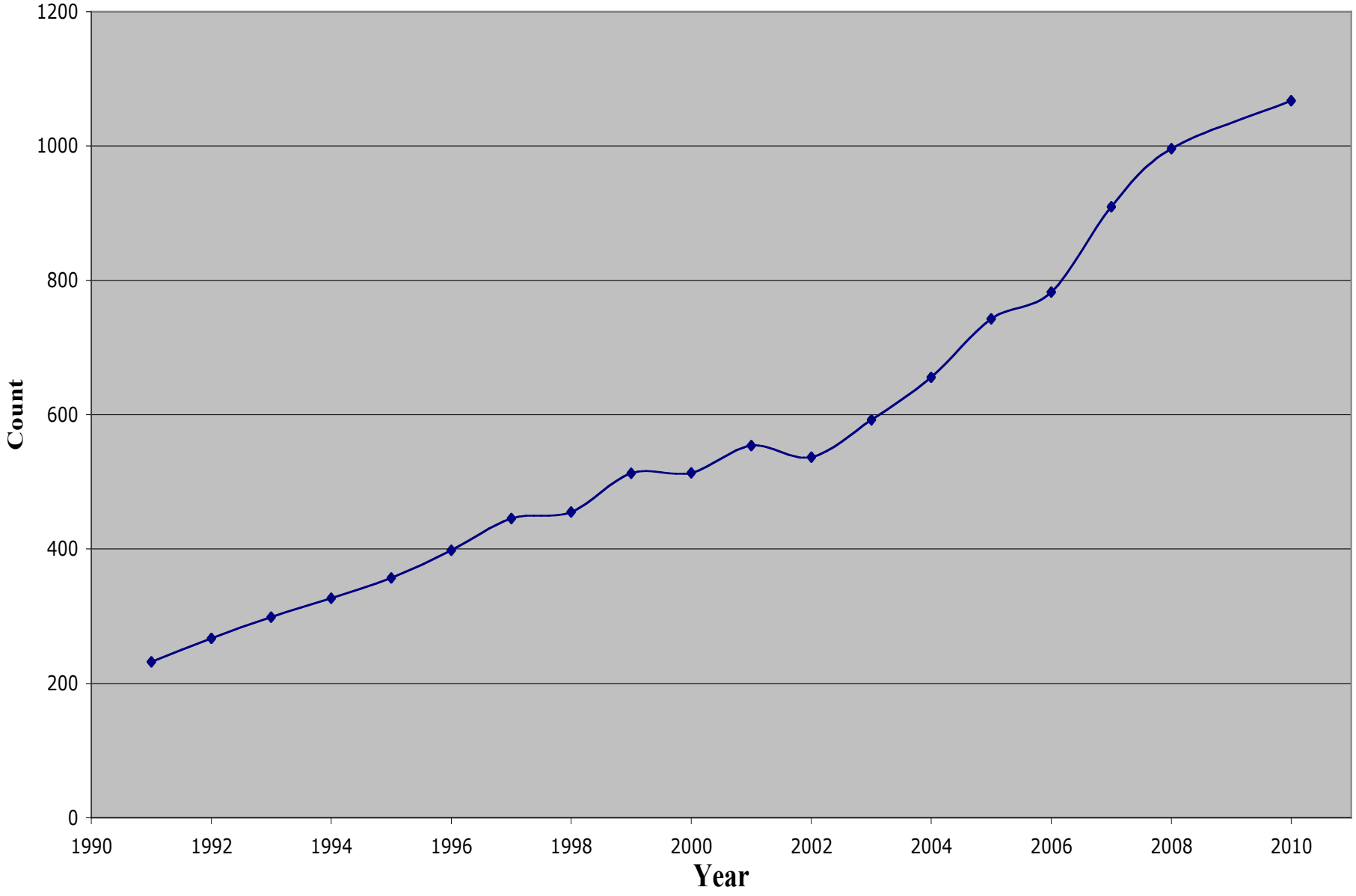

Figure 2 . Distribution of sea otters in Washington as a percentage of total population count within north and south segments, 1989-2008.