Results of the 2011 Survey of the Reintroduced Sea Otter Population in Washington State

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The 2011 Washington sea otter survey was conducted from 11-15 July 2011 and included the inshore waters of Washington from the South Jetty at the mouth of the Columbia River, northward along the outer Washington coast and into the Strait of Juan de Fuca to Tongue Point. Biologists and volunteers from the Washington Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Olympic Coast National Marine Sanctuary, Makah Fisheries, 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 excellent to poor for both the aerial and ground components. During this year's survey, fog and low visibility either prevented or reduced both ground and aerial counts on several days.

Methods

All of the known sea otter range in Washington was surveyed from the air in a Cessna 206 aircraft and included coverage of coastal waters from the South Jetty at the mouth of the Columbia River (covered only on the 11 July reconnaissance flight), north to Point Grenville (Point Grenville was the starting location for aerial surveys on all other days) and along the outer Olympic Peninsula coast to Cape Flattery then east into the Strait of Juan de Fuca to Tongue Point. Additional ground observers made 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 scheduled 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 survey total is a single high count calculated by summing the highest daily counts for the south segment (Point Grenville to La Push) and north segment (La Push to Tongue Point) of the known sea otter range along the Washington coast. This method of splitting the coast at La Push into south and north survey 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. Pups are identified visually and classified as dependent by their small size, wooly light brown pelage and close association (generally resting on the chest) with an adult. Population growth estimates are calculated using the 3-year running average of the annual survey counts.

Results and Discussion

In 2011, an initial reconnaissance flight was conducted on July 11; two aerial surveys were completed on July 12; one aerial survey was completed on July 13, and only the south portion was completed on 15 July. Although aerial surveys covered the area from Point Grenville to Tongue Point on July 13, portions of the coast were obscured due to low clouds and fog. No complete counts were made for either the aerial or ground components on 14 July due to low clouds and fog.

The high count for the 2011 Washington sea otter survey was the combined counts from the south segment on 15 July and the north segment on 12 July with a total of 1,154 sea otters counted. For comparative purposes, the 2007, 2008 and 2010 Washington sea otter survey counts were 1,125, 1,073 and 1,004 otters respectively (Table 1; Figure 1), with no surveys were completed in 2009 due to poor weather. This year, the southernmost sea otters were observed at near Point Grenville and Willoughby Rock and the northernmost otter was observed on the east side of Waadah Island near Neah Bay.

During the 2011 survey, 43 pups were counted during the high count and were observed at Diamond Rock/North Rock, inshore of Perkins Reef, Goodman Creek, Toleak Point, Giant's Graveyard, Cape Johnson, north of Cedar Creek, Yellow Banks, Sand Point, Ozette Island, Cape Alava, and Duk Point (off Seafield Creek). 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 day of the highest counts. The pup to independent ratio this year was 3.9:100, essentially unchanged from the 2010 pup to independent ratio of 4.1:100.

Survey results for 2011 indicate growth of the Washington sea otter population continues to remain positive overall, but slowing (Figure 1). Overall, the finite rate of increase for the Washington population since 1989 has been 7.9% ($R^2 = 0.95$).

Results from the north segment (La Push to Tongue Point) indicate that this segment may be approaching equilibrium density. For this segment there was a slight increase from 2010 (finite rate 3.24%, $R^2 = 0.57$), and there still appears to be some quality unoccupied habitat available north from Point of Arches. Sea otters were again sighted near Anderson Point in Makah Bay, and this group is the most recently established group of reproducing females in Washington (Table 1). During this year's survey, a few sea otters were seen consistently at Tatoosh Island, but no pups were observed. In the south segment (Point Grenville to La Push), the population has slowed its rate of increase, but overall is still

increasing at about 13% per year since 2000 ($R^2 = 0.84$). This decreased growth rate in the south segment and slight increase in the north segment may be due to a redistribution of individuals from the south to the north (Figure 2). These results illustrate the importance of continuing annual surveys to monitor population trends and changes in distribution. The change in distribution between the south and north population segments is a perplexing issue; especially since we know that in the past large numbers of sea otters have used the area in the Strait of Juan de Fuca as far east as Pillar Point and preferred sea otter prey is present, although patchy in nature, throughout this area.

The distribution pattern 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. In 2010 the distribution remained essentially unchanged. In 2011 the proportions were 62% south of La Push and 38% north of La Push. This year two sea otters were observed in the Strait of Juan de Fuca between Neah Bay and Tatoosh Island.

The single largest concentration of sea otters continues to be located at Destruction Island with 492 otters counted on 15 July this year. Consistent with recent surveys, a large male group continues to use the northeast reef and eastern kelp bed areas for resting, while increasing numbers of otters including females with pups are using the west end of the island. Counts made at other locations in the southern portion of the range indicate that otters including females with pups may be regularly moving relatively short distances 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. Similar movements have also been noted in the north survey segment with sea otters rafting areas inshore of Father and Son Rocks interchanging with rafting areas near Duk Point as well.

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, with the most recent report being a 2011 sighting of a lone individual between Anderson and McNeil Islands in south Puget Sound. 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 large group of otters that had moved into the western Strait of Juan de Fuca during fall and winter months has not been reported since 2000 and only a few individuals remain in this area east of Cape Flattery.

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Table 1. Results of the 2011 and 2010 July sea otter surveys in Washington State.

	2011			2010		
	Independent	Pup	Total	Independent	Pup	Total
WILLOUGHBY ROCK	2		2			
NORTH STEAMBOAT CREEK	1		1			
KALALOCH	1		1			
BROWNS POINT	2		2			
RUBY BEACH	1		1	2		2
DESTRUCTION ISLAND	492		492	391	5	396
MIDDLE ROCK/DIAMOND ROCK	154	1	155	193	1	194
HOH HEAD	1		1			
PERKINS REEF (ROCKS 443)	29	3	32			
ALEXANDER ISLAND	1		1			
GOODMAN CREEK	6	4	10			
TOLEAK/STRAWBERRY PT.	1	1	2			
GIANTS GRAVEYARD	9	5	14	2	1	3
RIALTO BEACH				1		1
S. of CHILEAN MEMORIAL				16	4	20
CAPE JOHNSON/BLUFF PT.	10	1	11	171		171
SANDY ISLAND	112		112	27	1	28
JAGGED ISLAND				1		1
CEDAR CREEK/NORWEGIAN MEMORIAL*	91	4	95	20	2	22
YELLOW BANKS AREA	50	3	53	11	0	11
SAND POINT*	17	4	21	16	3	19
INSHORE WHITE ROCK	3		3	5	1	6
WEDDING ROCKS				2		2
OZETTE ISLAND	5	1	6	4		4
OZETTE/CAPE ALAVA/BODELTEH*	8	3	11	54	14	68
OZETTE RIVER	2		2			
DUK POINT*	93	13	106	21	3	24
FATHER AND SON*	1		1	20	5	25
PT. OF ARCHES	4		4			
ANDERSON POINT*	6		6	7	0	7
TATOOSH ISLAND	7		7			
SLANT ROCK	1		1			
WAADAH ISLAND	1		1			
TOTAL	1111	43	1154	964	40	1004

*Ground count locations

Figure 1. **Growth of Washington sea otter population, showing 3-yr running average of counts, 1989-2011.**

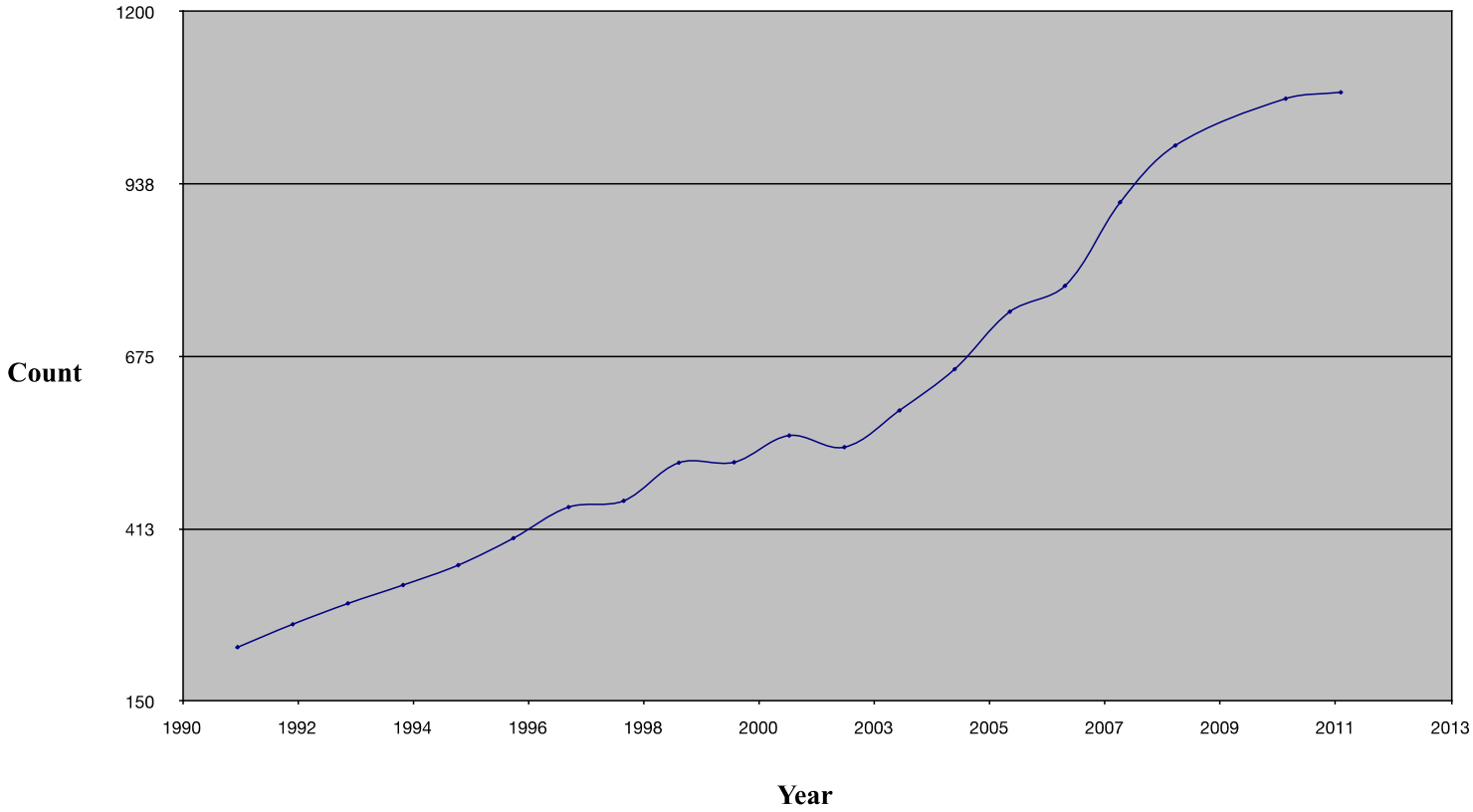

Figure 2. Comparative distribution of sea otters in Washington State between the north and south survey segments**,** 1989-2011.