Results of the 2012 Survey of the Reintroduced Sea Otter Population in Washington State

Ronald J. Jameson
Steven Jeffries

Washington Department of Fish and Wildlife
Wildlife Science Program
Marine Mammal Investigations
7801 Phillips Road SW
Lakewood WA 98498

28 March 2013

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The 2012 Washington sea otter survey was conducted from 9-13 July 2012 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. As with 2011 surveys, fog and low visibility prevented or reduced aerial and ground survey coverage on most 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 9 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 past Pillar Point to Tongue Point (just west of Port Angeles). Additionally, ground observers in the north segment 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 aerial 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 which is calculated by summing the highest daily counts for the south segment (Point Grenville to La Push) and north segment (La Push to Pillar Point) of the known sea otter range along the Washington coast and represents the maximum count over the sea otter range in Washington and as a single count does not have an associated variance or confidence limits. 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.

Results and Discussion

For aerial surveys, we conducted an initial reconnaissance flight on 9 July covering the area from the Columbia River to Tongue Point; two aerial surveys covering only the south segment were conducted on 10 July; due to low clouds and fog, no aerial survey was conducted on July 11; one complete aerial survey of the south and north segments was completed on July 12; and one complete aerial survey of the south and north segments was completed on July 13. Aerial surveys were impacted by low clouds and fog on all surveys days forcing surveys to be cancelled on July 11 and delayed on all other survey days. Ground surveys were conducted under fair to excellent conditions on all days although at times morning low clouds and fog reduced visibility to poor for ground observers.

The total count for the 2012 Washington sea otter survey was the combined high counts from the south segment on 10 July (812) and the north segment on 10 July (290) plus 3 independents observed at Tatoosh Island on the 9 July for a total of 1,105 sea otters counted (Table 1). For comparative purposes, the 2008, 2010 and 2011 Washington sea otter survey counts were 1,073, 1,004 and 1,154 otters respectively (Table 1; Figure 1). No surveys were completed in 2009 due to poor weather on all days. This year, the southernmost sea otters were observed near Cape Elizabeth (2 independents) and Willoughby Rock (2 independents and 1 pup) and the northernmost otters were observed at Tatoosh Island (4 independents).

During the 2012 survey, pups were observed at Willoughby Rock, Destruction Island, Diamond Rock/North Rock, Perkins Reef, inshore of Perkins Reef, Giant's Graveyard, Cape Johnson, north of Cedar Creek, Midway Beach, Yellow Banks, Sand Point, Ozette Island, Cape Alava, Duk Point (off Seafield Creek) and inshore of Father and Son. In some cases pups do not appear in the summary because they were not observed during the day of the highest counts. The pup to independent ratio this year declined to 2.7:100, compared to 3.9:100 in 2011, and 2010 pup to independent ratio of 4.1:100.

Survey results for 2012 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 Pillar Point) indicate that this segment may be approaching equilibrium density. For this segment there was a slight

increase from 2011 (finite rate 3.24%, $R^2 = 0.57$), and there still appears to be some quality unoccupied habitat available north from Point of Arches. During this year's survey, a small group of otters were seen consistently at Tatoosh Island, but no pups were observed. Sea otters numbers decreased substantially in the Bluff Point to Sandy Island area of the coast this year with no large raft observed during any flight.

Since 2000, growth in sea otter numbers in the south segment (Point Grenville to La Push) has slowed from the 20% per year increase observed in the 1990s. However, the population continues to increase at about 13% per year ($R^2 = 0.84$). In 2012, the majority of the Washington sea otter population was distributed in the south survey segment and may represent a redistribution of individuals from the north segment to the south segment (Figure 2). One pup was recorded at Willoughby Rock which is the furthest south an otter pup has been observed. No sea otters were observed in the Strait of Juan de Fuca between Neah Bay and Pillar Point.

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; in 2012 they were 27% and 73%, respectively. Whether this reflects a continuing shift in distribution or is an artifact of counting condition in the north, (no aerial coverage where there were no ground counts) is unknown. These results illustrate the importance of continuing annual surveys to monitor population trends and changes in distribution.

The single largest concentration of sea otters continues to be located at Destruction Island with 562 otters counted on 10 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 2012 sighting of a lone individual 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 today.

Acknowledgements

In addition to the authors of this report, the following individuals participated in the survey: Pilot Jeff Well from Rite Bros. Aviation in Port Angeles; Anita McMillan and Shelley Ament from the Washington Department of Fish and Wildlife; Deanna Lynch and Sue Thomas from the U.S. Fish and Wildlife Service; Shawn Larson, Pat McMahon, Caroline Hempstead and Traci Belting from The Seattle Aquarium; Lisa Triggs and Terre Zorman from the Point Defiance Zoo and Aquarium; Ed Bowlby and Mary Sue Brancato from the Olympic Coast National Marine Sanctuary; and Heather May from the Quinault Indian Nation, and volunteers Gwen Jameson, Kristin Laidre and Eli Gurarie. Bethany Diehl with Washington Department of Fish and Wildlife assisted with counting images and data entry.

The Olympic National Park and the Makah Nation provided research and special use permits for access to locations used by ground observers. Funding for this survey was provided by the Washington Department of Fish and Wildlife and the U.S. Fish and Wildlife Service (Cooperative Agreement No. F10AC00022).

Table 1. Results of the survey of the Washington sea otter population, 9-13 July 2012. It should be noted the ceiling was too low for aerial surveys north of La Push on 10 July when the highest count was obtained in that segment. This undoubtedly reduced the total count because areas not covered by ground observers were not surveyed. Most significant was the Yellow Banks site.

Location	Independent	Pups	Total
SOUTH RAFT RIVER	3	0	3
DESTRUCTION I.	531	4	535
HOH RIVER MOUTH	10	0	10
MIDDLE Rk/DIAMOND ROCK	209	8	217
NORTH ROCK	1	0	1
PERKINS REEF (ROCK 443)	30	0	30
GIANTS GRAVEYARD	16	0	16
CAPE JOHNSON/BLUFF PT.	0	0	0
CEDAR CRK./NOR. MEM.	143	1	144
SAND PT.	35	4	39
INSHORE WHITE ROCK /WEDDING ROCKS	3	0	3
WEDDING ROCKS	0	0	0
OZETTE I.	14	1	15
OZETTE/CAPE ALAVA/BODELTEH	3	1	4
WEST END OF BODELTEH	0	0	0
UMATILLA REEF	0	0	0
OZETTE RIVER	0	0	0
DUK PT.	62	8	70
FATHER AND SON	6	2	8
PT. OF ARCHES	0	0	0
ANDERSON PT.	7	0	7
S. PORTAGE HEAD	0	0	0
ARCHAWAT CREEK	0	0	0
MAKAH BAY	0	0	0
BAHOBOHOSH PT.	0	0	0
WAATCH PT.	0	0	0
FUCA PILLAR	0	0	0
TATOOSH I.	3	0	3
Totals	1076	29	1105

Figure 1. Growth of Washington sea otter population showing 3-year running average, 1989-2012.

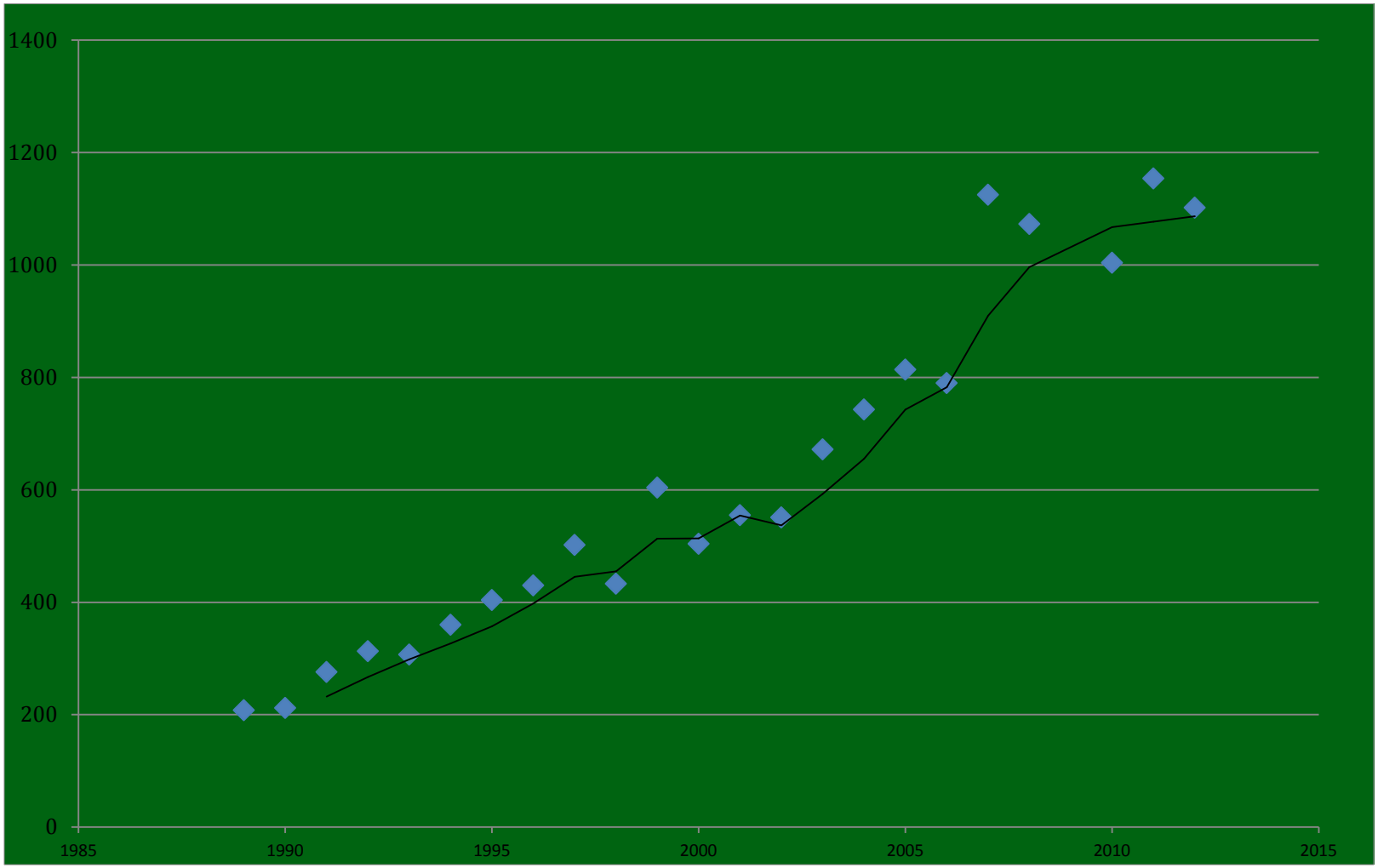

Figure 2. Comparative distribution of sea otters in Washington State between the north and south survey segments**,** 1989-2012.