GRAY WHALE CALF OCCURRENCE IN THE CHUKCHI SEA, SUMMER AND FALL 2015

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OVERVIEW

Eighty-three Eastern North Pacific gray whale (Eschrichtius robustus) calves were observed during systematic line transect aerial surveys conducted from July to October 2015 in the northeastern Chukchi Sea (67°-72°N, 165°-145°W). These surveys, part of the Aerial Surveys of Arctic Marine Mammals (ASAMM) project, funded by BOEM and co-managed by BOEM and NOAA, have been conducted from July to October since 2009 to document the relative abundance and distribution of marine mammals in the Chukchi Sea Planning Area. The Chukchi Sea is recognized as the northernmost extent of the gray whale’s seasonal migration, and serves as an important foraging and rearing grounds during summer and fall. Recent survey seasons have recorded an increase in gray whale calf occurrences. The gray whale calf ratio for 2015 (0.18; 83 calves, 465 total gray whales) was the second highest since 2009. Calf sighting rates (number of calves on effort per km flown) have also been high, particularly since 2012. Calf distribution in 2015 was similar to previous years, with the greatest number of sightings occurring nearshore along the Alaskan coast from Point Lay to Barrow, although 44% of gray whale calves sighted in 2015 were 25 to 85 km offshore NNW of Wainwright.

METHODS AND SURVEY EFFORT

- Line transect aerial surveys
- 2 July to 30 October 2015
- Twin engine turboprop aircraft with bubble windows
- Target altitude 366 m (1200 ft)
- Two marine mammal observers, one data recorder
- Chukchi Sea blocks 13-22, 23, and Beaufort Sea block 12. Block 23 was not surveyed prior to 2014 (Figure 1).
- Survey Effort: “on effort” (transect and circling from transect, Tr+TrC), “off effort” (search and circling from search), or deadhead
- ~ 36,300 km flown on and off effort within blocks 12-23 (Figure 1)

Calf Distribution

- In 2015, calves were distributed nearshore from Point Lay to Barrow in water < 50 m deep, similar to previous years (Figure 2).
- 44% of gray whale calves were sighted 25 to 85 km NNW of Wainwright (Figure 2)
- In 2015, 20 calves were sighted in block 14 (Figure 3), compared to a single calf in 2012 and 2014, and two in 2013.
- Gray whale calf sightings overlap with non-calf sightings both spatially and temporally; the offshore calf sightings were associated with other gray whales recorded as feeding.

Calf Sighting Rates Per Year

- Calf Sighting Rate: Number of gray whale calves per unit effort (CPUE), computed as gray whale calves (n) divided by the number of kilometers flown on effort (Tr+TrC km)
- In 2015, the gray whale calf sighting rate for blocks 12-22 and blocks 12-23, was almost equal to 2014 despite seeing fewer gray whales (Tables 1 and 2).
- The sighting rates for 2014 and 2015 were higher than any previous year (2009-2013).

Table 1. Gray whale calf ratios, on and off effort, July to October pooled, per year.

<table>
<thead>
<tr>
<th>Year</th>
<th>Survey Blocks</th>
<th>Whales</th>
<th>Calves</th>
<th>Calf Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>12-22</td>
<td>362</td>
<td>10</td>
<td>0.03</td>
</tr>
<tr>
<td>2010</td>
<td>12-22</td>
<td>283</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>2011</td>
<td>12-22</td>
<td>261</td>
<td>13</td>
<td>0.05</td>
</tr>
<tr>
<td>2012</td>
<td>12-22</td>
<td>558</td>
<td>67</td>
<td>0.12</td>
</tr>
<tr>
<td>2013</td>
<td>12-22</td>
<td>281</td>
<td>57</td>
<td>0.20</td>
</tr>
<tr>
<td>2014</td>
<td>12-22</td>
<td>541</td>
<td>99</td>
<td>0.18</td>
</tr>
<tr>
<td>2015</td>
<td>12-22</td>
<td>425</td>
<td>77</td>
<td>0.18</td>
</tr>
<tr>
<td>2015</td>
<td>12-23</td>
<td>868</td>
<td>109</td>
<td>0.13</td>
</tr>
<tr>
<td>2015</td>
<td>12-23</td>
<td>465</td>
<td>83</td>
<td>0.18</td>
</tr>
</tbody>
</table>

DISCUSSION

While survey effort varies annually and repeat calf sightings are possible, our gray whale calf occurrence findings are consistent with the NMFS Southwest Fisheries Science Center’s (SWFSC) counts of cow-calf pairs documented during their northward spring migration off the California coast (Figure 4; see the SWFSC’s Gray Whale Studies – Calf Production website at: https://swfsc.noaa.gov/textblock.aspx?Division=PRD&ParentMenuId=211&Id=16464).

- Increases in calf occurrence could be due to favorable foraging conditions from 2011 to 2014, resulting in higher reproductive success.
- More gray whale cow-calf pairs may be migrating to the northeastern Chukchi Sea if there is reduced resource productivity in other cow-calf pair habitat or increased inter- or intraspecific competition on favored foraging grounds.
- Future monitoring will be required to determine whether these high gray whale calf occurrence rates recorded in 2012 to 2015 are sustained.

Figure 1. 2015 flightlines flown on and off effort, survey blocks 12-23.

Figure 2. 2015 on- and off-effort calf sightings relative to shore.

Figure 3. 2015 on- and off-effort calf sightings in block 14.

Figure 4. Timeline of ASAMM’s annual gray whale calf counts in the Chukchi Sea study area and SWFSC’s northbound cow-calf pair counts off California, 2009-2015.

Acknowledgments

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