

BELUGA WHALE (*Delphinapterus leucas*): Beaufort Sea Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Beluga whales are distributed throughout seasonally ice-covered arctic and subarctic waters of the Northern Hemisphere (Gurevich 1980), and are closely associated with open leads and polynyas in ice-covered regions (Hazard 1988). Depending on season and region, beluga whales may occur in both offshore and coastal waters, with concentrations in Cook Inlet, Bristol Bay, Norton Sound, Kasegaluk Lagoon, and the Mackenzie Delta (Hazard 1988). It is assumed that most beluga whales from these summering areas overwinter in the Bering Sea, excluding those found in the northern Gulf of Alaska (Shelden 1994). Seasonal distribution is affected by ice cover, tidal conditions, access to prey, temperature, and human interaction (Lowry 1985). During the winter, beluga whales occur in offshore waters associated with pack ice. In the spring, they migrate to warmer coastal estuaries, bays, and rivers for molting (Finley 1982) and calving (Sergeant and Brodie 1969). Annual migrations may cover thousands of kilometers (Reeves 1990).

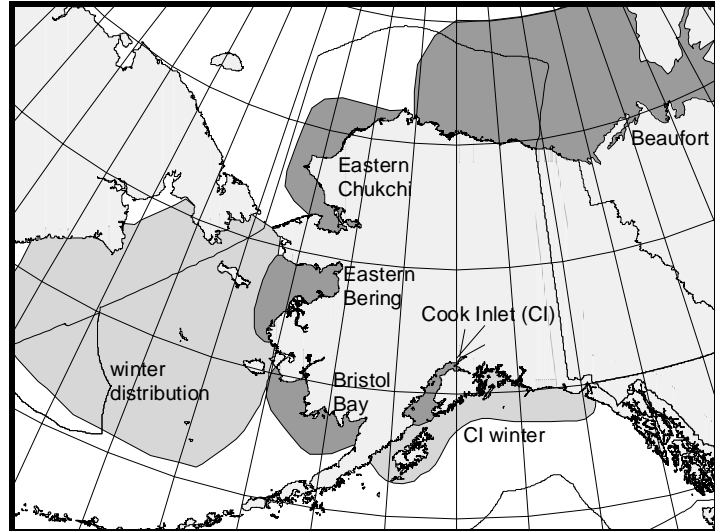


Figure 14. Approximate distribution of beluga whales in Alaska waters. The dark shading displays the summer distributions of the five stocks. Winter distributions are depicted with lighter shading.

The following information was considered in classifying beluga whale stock structure based on the Dizon et al. (1992) phylogeographic approach: 1) Distributional data: geographic distribution discontinuous in summer (Frost and Lowry 1990), distribution unknown outside of summer; 2) Population response data: possible extirpation of local populations; distinct population trends between regions occupied in summer; 3) Phenotypic data: unknown; and 4) Genotypic data: preliminary mitochondrial DNA analyses indicate distinct differences among summering areas (G. O'Corry-Crowe, unpubl. data, Southwest Fisheries Science Center, P.O. Box 271, La Jolla, CA 92038). Based on this information, 5 stocks of beluga whales are recognized within U. S. waters: 1) Cook Inlet, 2) Bristol Bay, 3) Eastern Bering Sea, 4) Eastern Chukchi Sea, and 5) Beaufort Sea (Fig. 14).

POPULATION SIZE

The sources of information to estimate abundance for belugas in the waters of northern Alaska and western Canada have included both opportunistic and systematic observations. Duval (1993) reported an estimate of 21,000 for the Beaufort Sea stock, similar to that reported by Seaman et al. (1985). The most recent aerial survey was conducted in July of 1992, when stock size was estimated to include 19,629 (CV=0.229) beluga whales (Harwood et al. 1996). To account for availability bias a correction factor of 2, which was not data-based, has been recommended for the Beaufort Sea beluga whale stock (Duval 1993), resulting in a population estimate of 39,258 (19,629 x 2) animals. A CV for the correction factor is not available; however, this correction factor was considered negatively biased by the Alaska SRG considering that CFs for this species typically range between 2.5 and 3.27 (Frost and Lowry 1995).

Minimum Population Estimate

For the Beaufort Sea stock of beluga whales, the minimum population estimate (N_{MIN}) is calculated according to Equation 1 from the PBR Guidelines (Wade and Angliss 1997). Thus, $N_{\text{MIN}} = N/\exp(0.842*[\ln(1+[CV(N)]^2)]^{1/2})$. Using the population estimate (N) of 39,258 and an associated CV of 0.229, N_{MIN} for this stock is 32,453.

Current Population Trend

The Beaufort Sea stock of beluga whales is considered to be stable or increasing (DeMaster 1995: pp. 16).

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

A reliable estimate of the maximum net productivity rate is currently unavailable for the Beaufort Sea stock of beluga whales. Hence, until additional data become available, it is recommended that the cetacean maximum theoretical net productivity rate (R_{MAX}) of 4% be employed for this stock (Wade and Angliss 1997).

POTENTIAL BIOLOGICAL REMOVAL

Under the 1994 re-authorized Marine Mammal Protection Act (MMPA), the potential biological removal (PBR) is defined as the product of the minimum population estimate, one-half the maximum theoretical net productivity rate, and a recovery factor: $PBR = N_{\text{MIN}} \times 0.5R_{\text{MAX}} \times F_R$. As this stock is stable or increasing (DeMaster 1995: pp. 16), the recovery factor (F_R) for this stock is 1.0 (Wade and Angliss 1997). Thus, for the Beaufort Sea stock of beluga whales, $PBR = 649$ animals ($32,453 \times 0.02 \times 1.0$).

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fisheries Information

The total fishery mortality and serious injury for this stock is estimated to be zero as there are no reports of mortality incidental to commercial fisheries in recent years. The estimated annual mortality rate incidental to commercial fisheries (0) is not known to exceed 10% of the PBR (65) and, therefore, is considered to be insignificant and approaching zero mortality and serious injury rate.

Subsistence/Native Harvest Information

The subsistence take of beluga whales within U. S. waters of the Beaufort Sea is reported by the Alaska Beluga Whale Committee (ABWC), who reported that the number of whales harvested annually for subsistence has averaged approximately 50 during the 5-year period from 1990 to 1994 (Frost and Suydam 1995). The 1995 harvest report for this stock is not available. Estimates from the Canadian harvest for this stock over the same 5-year period from 1990 to 1994 have averaged 110 whales per year (DeMaster 1995, pp. 15). Thus, the mean estimated subsistence take for the Beaufort Sea beluga stock is 160 (50+110). This estimate is based on household surveys and on-site harvest monitoring, but is negatively biased because it has not been corrected for hunters that did not respond, and does not account for animals which are struck and lost. There is not a reliable estimate for the percent struck and lost from this stock.

In the draft stock assessment reports (Hill et al. 1996), subsistence mortality was averaged over the most recent 3-year period for which data were available. This was an attempt to incorporate interannual variability, while still recognizing that mortality rates have declined in recent years. However, based on a request from the ABWC, human-related removals have been averaged over the last 5 years for which data are available for all beluga whale stocks, except the Cook Inlet stock. This request was due to the large amount of interannual variability in harvest levels in most areas (letter from ABWC to Alaska SRG, 20 December 1996).

STATUS OF STOCK

Beluga whales are not listed as “depleted” under the MMPA or listed as “threatened” or “endangered” under the Endangered Species Act. Based on currently available data, the level of human-caused mortality and serious injury (160) is not known to exceed the PBR (649). Therefore, the Beaufort Sea stock of beluga whales is not classified as a strategic stock. The population size is considered stable or increasing, however, at this time it is not possible to assess the status of this stock relative to OSP.

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