

BELUGA WHALE (*Delphinapterus leucas*): Eastern Chukchi 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).

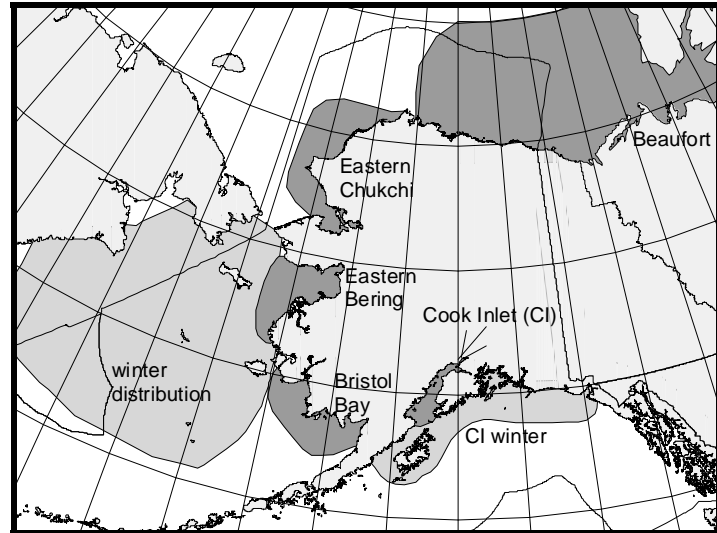


Figure 15. Approximate distribution of beluga whales in Alaska waters. The dark shading displays the summer distributions of the five stocks. Winter distributions are depicted with lighter shading.

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. 15).

POPULATION SIZE

Frost et al. (1993) estimated the minimum size of the eastern Chukchi stock of belugas at 1,200, based on counts of animals from aerial surveys conducted during 1989-91. Survey effort was concentrated on the 170 km long Kasegaluk Lagoon, an area known to be regularly used by belugas during the open-water season. Other areas that belugas from this stock are known to frequent (e.g., Kotzebue Sound) were not surveyed. Therefore, the survey effort resulted in a minimum count. If this count is corrected for the proportion of animals that were diving using radio telemetry data and thus not visible at the surface (2.62, Frost and Lowry 1995), and for the proportion of newborns and yearlings not observed due to small size and dark coloration (1.18; Brodie 1971), the total corrected abundance estimate for the eastern Chukchi stock is 3,710 (1,200 x 2.62 x 1.18).

Minimum Population Estimate

The survey technique utilized for estimating the abundance of beluga whales is a direct count which incorporates correction factors. Although CVs of the correction factors are not available, the Alaska Scientific Review

Group concluded that the population estimate of 3,710 can serve as an estimate of minimum population size because the survey did not include areas where beluga are known to occur (Small and DeMaster 1995). That is, if the distribution of beluga whales in the eastern Chukchi Sea is similar to the distribution of beluga whales in the Beaufort Sea, which is likely, then a substantial fraction of the population remains in offshore waters during the survey period (DeMaster 1997).

Current Population Trend

The most recent raw counts (1,200 animals) of beluga whales in this area are similar to counts of 1,104 and 1,601 conducted in the same area during the summer of 1979 (Frost et al. 1993). Based on these data, there is no evidence that the Eastern Chukchi Sea stock of beluga whales is declining in spite of a history of subsistence takes.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

A reliable estimate of the maximum net productivity rate is currently unavailable for this 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: $PBR = N_{MIN} \times 0.5R_{MAX} \times F_R$. This stock is considered relatively stable and not declining in the presence of known take, thus the recovery factor (F_R) for this stock is 1.0 (DeMaster 1995: pp. 17, Wade and Angliss 1997). For the Eastern Chukchi Sea stock of beluga whales, $PBR = 74$ animals ($3,710 \times 0.02 \times 1.0$).

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Fisheries Information

Three different commercial fisheries that could have interacted with beluga whales from this stock were monitored for incidental take by NMFS observers during 1990-95: Bering Sea (and Aleutian Islands) groundfish trawl, longline, and pot fisheries. Observers did not report any mortality or serious injury of beluga whales incidental to these groundfish fisheries. An additional source of information on the number of beluga whales killed or injured incidental to commercial fishery operations is the logbook reports maintained by vessel operators required by the MMPA interim exemption program. During the 4-year period between 1990 and 1993, logbook reports, where observer data were not available, did not include any mortality to beluga whales from this stock. Complete logbook data after 1993 are not available.

In the near shore waters of the Eastern Chukchi Sea, substantial effort occurs in gillnet (mostly set nets), and personal-use fisheries. Although a potential source of mortality, there have been no reported takes of beluga whales as a result of these fisheries.

The estimated minimum annual mortality rate incidental to commercial fisheries (0) is not known to exceed 10% of the PBR (7) 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 from the eastern Chukchi Sea stock is provided by the ABWC, who reported that the number of whales harvested for subsistence has averaged approximately 54 whales annually during the 5-year period from 1991 to 1995 (Frost and Suydam 1995, ABWC unpubl. data, ABWC, P.O. Box 69, Barrow, AK, 99723). This estimate is based on household surveys and on-site harvest monitoring, but is negatively biased because there is not a reliable estimate for the percent struck and lost. The 1995 subsistence take of 43 animals includes 6 whales which were reported as struck and lost (ABWC unpubl. data, ABWC, P.O. Box 69, Barrow, AK, 99723).

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 estimated annual rate of human-caused mortality and serious injury (54) is not known to exceed the PBR (74). Therefore, the Eastern Chukchi Sea stock of beluga whales is not classified as a strategic stock. The population size is considered stable, however, at this time it is not possible to assess the status of this stock relative to OSP.

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